



National Park Service Southeast Region  
Long Range Transportation Plan  
**Stakeholder Engagement Summary Report**



U.S. Department of Transportation  
**Federal Highway Administration**

September 2016

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## Introduction

*The SER LRTP Core Team engaged a variety of stakeholders to understand the different perspectives of individuals at numerous levels of the National Park Service and Federal Highway Administration (FHWA) Eastern Federal Lands Highway Division (EFLHD) management structure. This Stakeholder Engagement Summary Report provides details on two critical efforts that directly informed the development of the Southeast Region LRTP: the SER Focus Park visits and the SER superintendent survey.*

## Focus Park Visits

SER staff identified nine Focus Park units that are representative of the broad range of units in the region. The SER LRTP Core Team visited each of these Focus Parks over the course of several months in the fall of 2014. The Focus Park visits provided the Core Team with a better understanding of both shared and unique unit level transportation conditions, needs, opportunities, and strategies. Because the Core Team was not able to visit all 66 park units in the region, each Focus Park served as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The qualitative data, park staff input, and lessons learned from the Focus Park visits informed the development of the SER LRTP. This summary report includes reports from each of the nine Focus Park visits.

The nine Focus Parks are comprised of the following park units:

- Big South Fork National River and Recreation Area
- Blue Ridge Parkway
- Fort Sumter National Monument
- Great Smoky Mountains National Park
- Gulf Islands National Seashore
- Kennesaw Mountain National Battlefield Park
- Mammoth Cave National Park
- San Juan National Historic Site
- Stones River National Battlefield



## Southeast Region Superintendent Survey

The consultant team, in conjunction with the SER LRTP Core Team, developed a survey instrument to collect additional information about transportation-related visitor experience within park units. The lessons learned from the Focus Park visits helped guide the survey design. The purpose of the survey was to collect information that will help the NPS develop a LRTP for the Southeast Region. In particular, the survey instrument was designed to collect information about transportation-related conditions, needs and issues, and effects on park resources and visitors' experiences in each park unit in the region.

The survey was distributed to the superintendents of all 66 SER park units, and the survey results serve as the basis of a substantial portion of the baseline analysis contained in the Visitor Experience, Access and Mobility chapter of the LRTP.

This summary report includes a summary of findings from the superintendent survey.

## State Department of Transportation and FHWA State Federal Aid Division Office Webinars

In the early stages of the project, the Southeast Region LRTP Core Team conducted two webinar presentations that were open to representatives of each State DOT and FHWA Federal-aid Highway Division Office for the nine-state Southeast Region and two territories. The webinars outlined the overall Southeast Region LRTP approach, provided a preliminary assessment of baseline conditions, and afforded participants an opportunity to learn more about the LRTP process and to suggest ways in which their agencies could provide input on the LRTP effort.

## Project Management and Technical Input

### CORE TEAM

The SER LRTP Core Team served as a task group to organize the broader advisory and technical contributors during the LRTP process; plan specific outreach efforts; obtain input from other stakeholder groups; attend and facilitate meetings, discussions, and site visits; document results in the plan; and revise the plan as appropriate.

The SER LRTP Core Team was comprised of the following members:

- Lewis Grimm, FHWA EFL – Highway Division
- Chris Jaeschke, FHWA EFL – Highway Division
- Teresa Parker, FHWA EFL – Highway Division
- Richelle Ellis, FHWA EFL – Highway Division
- Kent Cochran, NPS Southeast Region
- Barbara Hatcher, NPS Southeast Region
- Teresa Cantrell, NPS Southeast Region
- Wm. Bryce Lloyd, NPS WASO Facilities Planning Branch
- Stephanie Fischer, NPS WASO Facilities Planning Branch



## ADVISORY COMMITTEE

The Core Team identified key stakeholders within the region to serve on the SER LRTP Advisory Committee, which the Core Team engaged periodically to provide technical input and to ground-truth analyses and findings at key stages in the LRTP process.

The Advisory Committee was chosen with the goal of providing broad representation for various disciplines, park types, and regional and park unit roles and positions to help establish consensus across the Southeast Region. Committee members played a critical role in identifying goals and objectives, framing the investment strategy, and providing park-unit level examples and context throughout the planning process.

The SER LRTP Advisory Committee was comprised of the following members:

- Dianne Flaugh, Great Smoky Mountains National Park
- Barry Boyd, Natchez Trace Parkway
- Mark Woods, Blue Ridge Parkway
- Pat Kenney, Cape Lookout National Seashore
- Jeri DeYoung, Cape Lookout National Seashore (*formerly of Carl Sandburg Home NHS*)
- Steve McCoy, Gulf Islands National Seashore
- Jayne Schaeffer, Virgin Islands National Park
- Shawn Benge, Southeast Region
- Rich Devenney, Southeast Region
- Lee Edwards, Southeast Region
- Ben West, Southeast Region

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# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



## Big South Fork National River and Recreation Area

October 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at Big South Fork National River and Recreation Area in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the SER LRTP effort, SER staff have identified nine Focus Park units that are representative of the broad range of units in the region. The SER LRTP core project team will visit each of these Focus Parks over the course of several months at the start of the LRTP effort to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 park units within the Southeast Region, each focus park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

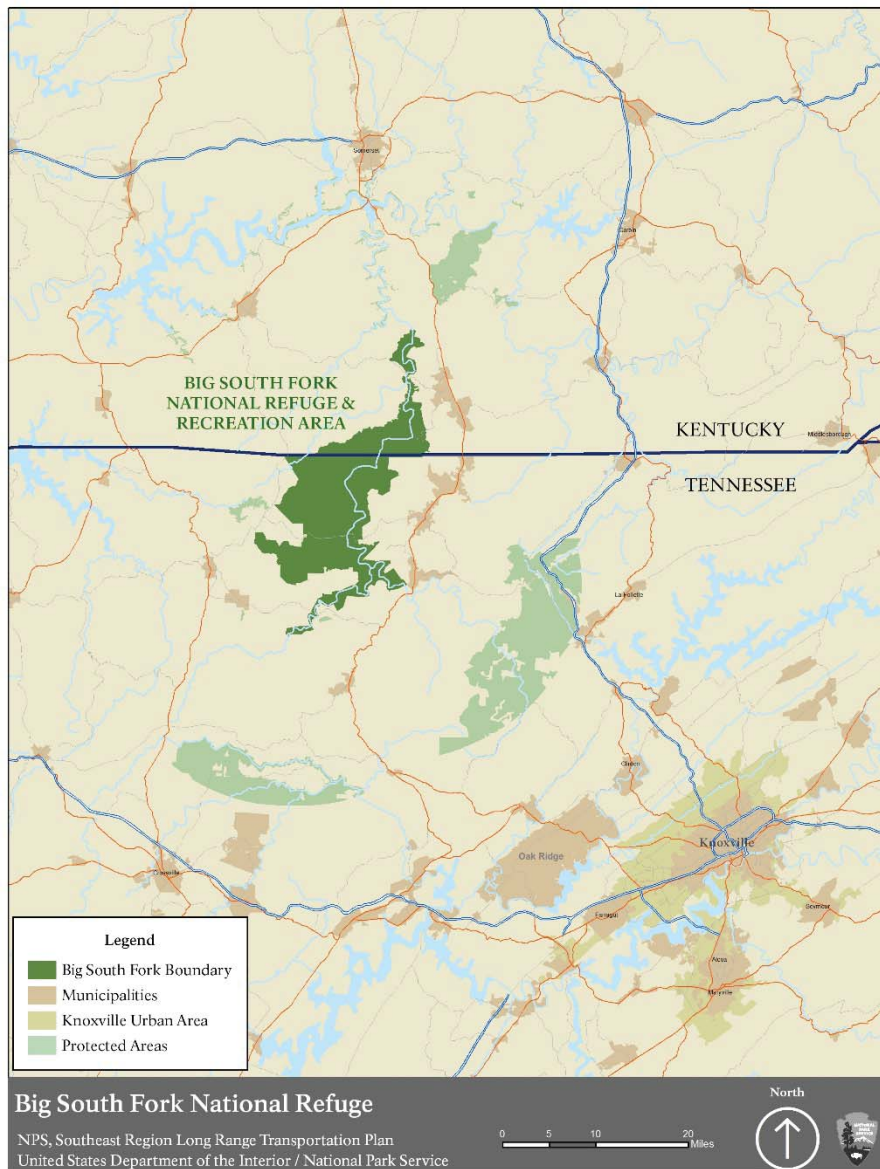
The fourth of the nine Focus Park visits took place at Big South Fork National River and Recreation Area (NRRRA) on September 22-23, 2014. The visit included conversations with park staff as well as a park tour and field review to observe firsthand specific transportation assets and conditions. The site visit was attended by the following individuals:

- Niki Stephanie Nicholas, Superintendent, Big South Fork NRRRA
- Tom Blount, Chief of Resource Management, Big South Fork NRRRA
- Johanna Wheeler, Chief of Facilities Management, Big South Fork NRRRA
- Wallace Linder, Roads and Trails Supervisor, Big South Fork NRRRA
- Randy Scoggins, Chief of Visitor and Resource Protection, Big South Fork NRRRA
- Noel Mays, Deputy Chief, Big South Fork NRRRA
- Henrietta DeGroot, Community Planner, Big South Fork NRRRA
- Teresa Cantrell, National Park Service Southeast Region
- Nat Grier, VHB
- Corey Pitts, VHB

## Park Overview

Big South Fork NRR is located in the Cumberland Plateau, spanning both Kentucky and Tennessee, about 70 miles northwest of Knoxville (Figure 1). The park, which spans nearly 125,000 acres, preserves a tributary of the Cumberland River and the land around it for biodiversity and recreational purposes.

Figure 1: Regional Context Map



Source: NPS and ESRI

The primary purpose of the park, which was established in 1974, is “conserving and interpreting an area containing unique cultural, historic, geologic, fish and wildlife, archaeologic, scenic and recreational values, preserving as a natural free-flowing stream the Big South Fork of the Cumberland River, major portions of its Clear Fork and New River stems, and portions of their various tributaries for the benefit and enjoyment of present and future generations, the

preservation of the natural integrity of the scenic gorges and valleys and the development of the area's potential for healthful outdoor recreation.”<sup>1</sup> This was the first time a National River and National Recreation Area were combined, combining both preservation of historic and natural resources and providing access for activities such as hunting and fishing, hiking, biking, and kayaking as goals.

This dual mission creates challenges for the Park Service. Providing safe, well-maintained access to the park's existing trails can be overwhelming with over fifty entrances to the park. Preserving and protecting natural resources found within the park can be at odds with providing access to certain areas of the park. Efforts to guide recreational users around certain sensitive areas have resulted in many creative solutions. This also requires providing facilities that can accommodate a variety of different user groups from hikers arriving in personal vehicles to horseback riders arriving with large trailers.

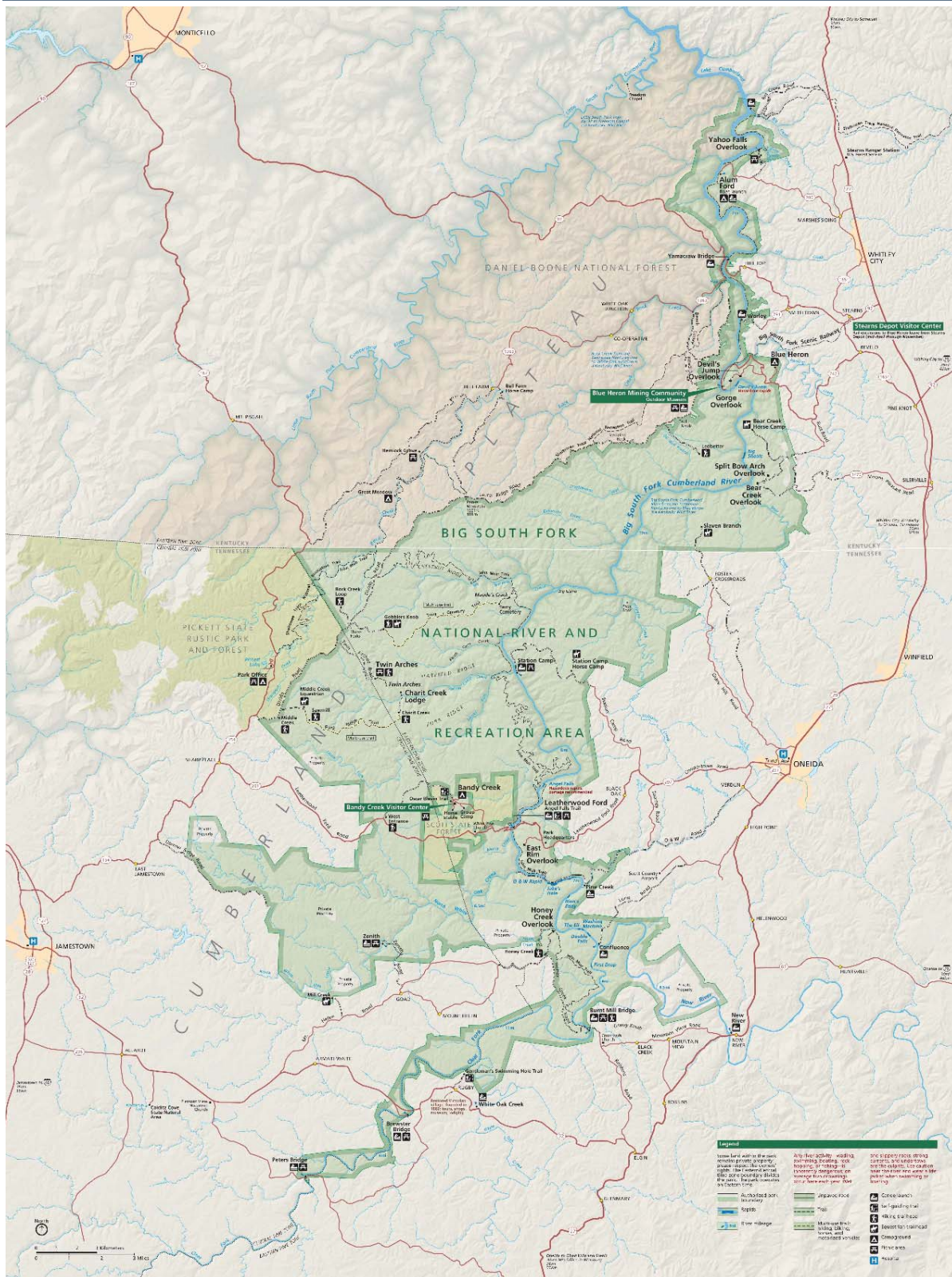
Big South Fork NRRRA is located in a rural area of Tennessee and Kentucky, with little to no occurrences of congestion that impact park operations or access. They do however have issues with large trucks traveling through the park and getting caught in the gorge due to the steep grades, resulting in minor traffic impacts. The greatest transportation challenge for the park is associated with funding for maintenance and signage directing people to the various park entrances. See Figure 2 for a park map.

The following sections of the report provide further details on the park's transportation conditions, challenges, and needs based on the conversations with park staff and field observations gleaned during the Focus Park visit.

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<sup>1</sup> 16 USC Chapter 1, Subchapter LXXXIX: Big South Fork National River and Recreation Area

Figure 2: Map of Big South Fork NRA



Source: NPS.

## Asset Management

### Transportation Assets

#### ROADS

There are 25 miles of paved roads maintained by the Park Service. The majority of roads within the park are unpaved, totaling approximately 65 miles of roadway. There are also roughly 75 miles of back country roads which are classified as “multi-use trails.” These facilities were reclassified as “multi-use trails” to allow for horseback riding, bicycling and hiking.

The primary road through the park is Leatherwood Ford Road (Route 297), which traverses the park from Oneida to Sharp Place. The road is a 7.2-mile-long, two-lane facility providing connections to the park headquarters and the Bandy Creek Visitor Center. The road was constructed by the Corps of Engineers but is now a State Route. It runs from east to west through the park, traveling through Scott State Forest as well as both Scott and Fentress Counties. As one of a handful of roads that travel east-west through this area of Tennessee, the road is used by local traffic as well as park traffic. Other major paved facilities include the East Bandy Creek Road and the Blue Heron Mine Road.

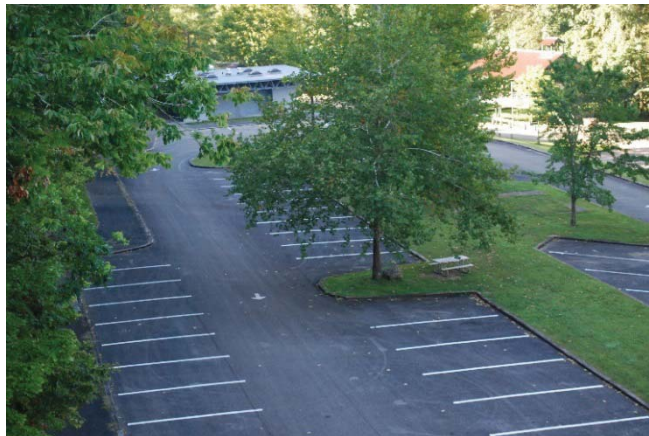
There is currently only one substantial proposed roadway improvements in the park:

- Pave the entrance road to Yahoo Falls in a joint project with McCreary County, Kentucky, and USFS.

#### PARKING

Big South Fork NRRRA has 93 parking lots of varying size and levels of utilization. All parking lots in the park are free of charge. About half of the lots are paved, with the other half unpaved. Parking accommodates visitors to specific sites, trailhead access, parking for horse trailers, and parking for camping. In addition, the park uses the grass fields at Bandy Creek to accommodate special events such as the Spring Planting Festival in April and the Storytelling Festival in September.

Like many parks, demand for parking has high temporal variation. Parking lots can fill on summer and fall weekends but may have little or no use mid-week. Special events result in a noticeable excess demand, though this is normally accommodated through the designated overflow lots. Certain portions of some lots, such as the Blue Heron Mine 18 lot will fill up with users accessing the canoe and kayak launch. Similarly, during peak equestrian use times, the areas designated for horse trailer parking may fill.



Upper parking lot at Blue Heron Mining Community

## **BRIDGES**

There are three FHWA rated and inspected bridges in the park. The former coal tippie in Blue Heron is a pedestrian-only bridge though work is underway to allow bicycles to use it. It is fracture-critical. The park has plans to replace the bridge deck in the coming years.

## **PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES**

Big South Fork NRRRA has over 400 miles of trails for a variety of different user groups, accessing different sites including scenic overlooks, historic resources, waterfalls, and other natural resources. There are a number of different exclusive hiking trails included within the park. Many of the trails within the park connect to provide a larger network. In fact, portions of trails within Big South Fork NRRRA are part of the Sheltowee Trace National Recreation Trail, a 320-mile-long trail that travels through the Daniel Boone National Forest and other state parks. Plans call for the Sheltowee Trace to eventually connect with the Appalachian Trail. There are also sections that overlap with the John Muir National Recreation Trail, which is thought to follow the naturalist's path through Tennessee during his trek from Kentucky to Tennessee.

Mountain biking is a popular use of the trail network within Big South Fork NRRRA. Other than the trails that are signed for hiking and/or horseback riding only, mountain biking is allowed on most of the multi-use trails in the park. The park has identified a number of trails and loops for mountain biking that include over 20 miles of single track. The International Mountain Bicycling Association (IMBA) awarded Big South Fork NRRRA their Epic® designation in 2013. The designation is given to demanding single-track rides that occur in a natural setting. The grouping of the Collier Ridge, West Bandy, Duncan Hollow, Grand Gap, and part of the John Muir Trail received the designation.

Big South Fork NRRRA is a popular destination for equestrians. With over 180 miles of horse trails as well as overnight facilities for horses, the park is well positioned to accommodate riders for short afternoon rides to multi-day adventures. In an effort to expand the number of trails open to horseback riders, the park re-designated many of their backcountry roads as multi-use trails. The benefit was the addition of 75 miles to the trail network; the drawback was that funding for multi-use trails is not as extensive as the funding for roads, creating challenges to maintain them. The park has four sites that provide horse facilities ranging from tie outs to stalls for boarding of horses.

The Big South Fork River and its tributaries are a major attraction for their scenic beauty and recreational opportunities, and the river is estimated to be the second highest visitation location within the park. The river provides a range of whitewater paddling experiences from Class I to IV rapids depending on the season and rainfall amounts. There are 12 access locations along the river and its tributaries located within the park. While the unique scour-based ecosystem of the river makes it largely immune to certain recreational impacts, the park is home to one of the greatest numbers of endangered freshwater species in the Park System. The park has gone to great efforts to minimize recreational impacts on streams and rivers, in particular the development of a reinforced crossing that minimizes sediment associated with horse crossings.



Left: Signage for the Sheltoree Trace National Recreation Trail; Right: Signage designation user groups for the multi-use trail.

## ATS

The park does not currently provide any alternative transportation options; however, a historic railroad operates in part of the park through a concession agreement. Outfitters will regularly provide shuttles associated with river trips. In addition, the park does accommodate large groups who arrive via charter or school bus.

## Funding and Partnerships

### ROADS

One of the main challenges facing roads around the park is the number of partner agencies Big South Fork NRR has to balance. By spanning two states and multiple counties, there are a variety of standards, goals, funding situations, and partners to address. Just finding the time to attend all the various meetings that occur with the small number of park staff available presents a challenge. Historically, much of the coordination between the park and neighboring agencies was accomplished at the interpersonal level, but as staff change and shrink – both within the park and outside – maintaining these communication channels is difficult, often resulting in uncertainty of capital programming. The park is reestablishing maintenance MOUs with the adjacent counties—with whom relations and communication are already good—and work to develop similar agreements with the Tennessee and Kentucky DOTs. They also are working on agreements with USFS and State Forests.

Of particular concern to the park is wayfinding and signage to the park. Signage requires different collaboration depending on direction of approach and may require collaboration with both state and county agencies. This has resulted in inconsistent and incomplete signage outside the park—staff are still working to get directional signage installed in many areas. Staff also believe the difficulty installing and modifying signage contributes to the problems with trucks traveling through the park. The signage warning trucks about the grade of Route 297 does not occur until it is too late to choose an alternative route. This makes it impossible for a trucker unfamiliar with the area to avoid this challenging stretch of roadway.

As discussed above, there is an acute challenge in funding roadway maintenance associated with the unpaved facilities that have been classified as multi-use trails. These facilities may be some of the most heavily used facilities in the park, but there is less funding available for trails than roads. While they are viewed primarily as transportation (versus recreation) assets by the park, NPS guidelines do not permit non-auto users on a roadway.

The park staff feel that they generally have good working relationships with local and county staff. For example, McCreary County recently applied for FLAP funds to pave the road leading into Yahoo Falls and the parking area. They would support the effort through providing maintenance as well.



Left: Directional sign on approach to Big South Fork NRA; Right: Signage warning truckers of grades and curves

## PARKING

As noted above, the Park has helped McCreary County apply for FLAP funds to pave the access road to Yahoo Falls, which would include paving the parking and picnicking facilities.

The park has developed a strong relationship with the neighboring federal penitentiary. Inmates provide a wide range of maintenance support throughout the park, including ground maintenance in parking areas and visitor centers.

## PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES

The park has an extensive network of trails that requires maintenance. The roads and trails supervisor spends general park funds purchasing gravel to keep the trails maintained. This is a result of the funding constraints associated with them being classified as multi-use trails. There are many trailheads that are in need of improvement due to the number and limited funding/staff. The park relies on volunteers for assistance in reporting problems and maintenance.

Another potential for partnership opportunities is with the many gateway communities that surround the park. In recent years, many have begun to promote the park and associated recreation opportunities to take advantage of the potential economic opportunities that could be gained through a strong partnership. Fentress County is billing itself as the "Trail Riding Capital of the Southeast" in an effort to capture the tourism dollars associated with trail riding. The county is home to a number of outfitters, campgrounds, and retreats that cater to horseback riding. The town of Stearns, Kentucky, was recently labeled a "Trail Town" by the Kentucky Department of Travel. The Trail Town program is designed to help communities highlight their connection to local trails and adventure tourism for travelers, improving the local economy. Stearns is located at the northern end of the park near the Blue Heron Mining Community.



Left: Example of hiking trail; Right: Sign for Stearns Trail Town

### ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

The park does not currently operate any ATS. The Big South Fork Scenic Railway operates out of the town of Stearns. The railway provides train excursions to various locations in the area, including the Blue Heron Mining Community. The train runs one trip a day Sunday through Friday, excluding Mondays, and multiple trips on Saturdays. The Scenic Railway has also partnered with Sheltoewe Outfitters to provide trail rides and canoe trips.



Left: Big South Fork Scenic Railway Station in Stearns, KY; Right: Big South Fork Scenic Railway stop at Blue Heron Mining Community.

## Sustainable Operations

### Environmental Sustainability

The park's commitment to environmental sustainability can be seen through efforts to protect sensitive areas and species within the park as a central mission. These include designing river crossings to protect certain species found in the water as well as developing plans to guide oil and gas operations on park lands. The park has also worked to reintroduce black bear and elk into the park. Currently, the efforts have been successful.

The park has explored the use of alternative fuel vehicles. Early trials of biodiesel were unsuccessful as the equipment was not designed to run on biogenic fuels and they ran into congealing problems in the winter. Separately, the park had experimented with CNG. The CNG garbage truck had to be refueled in Knoxville at substantial time and fuel cost. It subsequently broke and the park submitted a request for a replacement. Additionally, the park had a CNG fueling station for small equipment which also broke and the park does not currently have the funds to repair. Other considerations include the use of solar technology and water collection technologies to provide amenities in areas of the park without having to extend public utilities.

### Financial Sustainability

#### FUNDING

A consistent theme voiced by park and regional staff during the Focus Park visit was chronic underfunding of transportation needs in the park. As mentioned previously, the park uses base operating funds to cover the gap in their trail maintenance, which reduces the resources available for other transportation projects. Park staff must therefore choose a limited number of transportation projects to fund, while leaving numerous other legitimate needs unfunded each year. Staff are also concerned that much of the original infrastructure in the park is reaching the end of its original design life—while maintenance has been limited to normal upkeep, capital requirements are going to grow substantially in coming years as larger assets need significant repair or replacement.

Where feasible and logical, the park has made efforts to partner with area agencies to provide maintenance, construction, and signing. Navigating the many agencies that have an interaction with the park can be confusing and time consuming, so taking advantage of additional resources can be a challenge.

#### STAFFING

Staffing is another major challenge for the park. Park representatives reported that staffing has decreased while demands on the park have increased. Using operating funds to fill gaps makes it difficult to replace high-grade staff with similarly qualified employees. Park staff mentioned that they regularly use temporary employees, but have been unable to hire and/or convert them to permanent status.

Park staff noted that in 2006, WASO performed a business study comparing total road and trails assets to standard rates of miles of trail/acres of park per employee and determined that an additional 14 FTE were needed just to maintain trails. They were eventually approved by the region to get an increase of 7 FTE in 2010 before major cuts hit the entire NPS system.

## Safety

### Intermodal Conflicts

The park noted no locations within the park that were common for traffic incidents. The only issue related to traffic that was mentioned was the issue with some tractor trailers getting caught trying to cross the park using Leatherwood Ford Road due to the steep grades and curves.

As noted above, as part of its GMP, the park has redesignated many of its roads as multi-use trails to allow access to horses, pedestrians, and bicycles and to discourage auto use. The standard is for a two-track path on the existing roadbed, approximately eight feet in width with no more than a two-foot clearance on either side. There are generally no pullouts or other parking areas along the multi-use trails, although there are normally additional parking areas at the end of the multi-use section acting as trailheads for additional non-auto trails. It is not uncommon that horse trailers or other vehicles use the roads requiring other vehicles and non-vehicular users to find a way to pass or backup. There have been no incidents to date but the park is concerned that users may not always fully appreciate the narrow, more trail-like conditions of the paths (as they were formerly roads).

### Data Gaps

Park staff did not identify specific data gaps as hindering transportation operations or planning. They noted that in recent years they have worked to consolidate access points to the park, but that there are still over 50 access points. Many connect directly to adjacent communities and horse ranches, making it difficult to ensure a full measurement of visitation.

## User Experience, Mobility, and Access

### Visitation

Visitation at Big South Fork NRA was reported at just over 600,000 in 2012. While visitation over the past four years seems to have dropped slightly, there is no clear trend in visitation numbers from the past 15-plus years of data available. According to the most recent visitation study, 57 percent of visitors are from Tennessee, with 44 percent residing within a 50 miles radius of the park. Most visitors (76 percent) arrived in a single vehicle and stayed an average of four hours.

According to the *Visitor Study* most people come to the park for the scenery. Hiking and camping account for a third of visits, horseback riding about a quarter, biking and water sports less than a tenth, and hunting just over a tenth. Seventeen percent of visitors came for the historical and/or cultural resources. Eight percent came for a special event.

Park staff noted that use of bicycles and water-based recreation in the park is increasing. There are multiple Commercial Use Authorizations (CUAs) and the park expects more outfitters will want to provide water access, in particular.

### Mobility and Visitor Experience

Transportation plays a vital role in the visitor experience at Big South Fork NRA. Most visitors will arrive by personal vehicle. The importance of signage in accessing the park and getting to the desired destination cannot be discounted. A question about the directional signage to the park was included in the *Visitor Survey*. Most people (81 percent) rated the signage within the park as “adequate,” with just under 60 percent rating the signage on the interstates similarly. This mirrors comments made by staff that the signing for the park from the interstate is not as clear as would be desired. Based on observation, and confirmed by park staff, signage outside the park is inconsistent. Some approaches and portions of the park are very well-signed, starting at the Interstates and other major roads. In other cases, signs are incomplete, or simply not present. This is particularly challenging as many portions of the park must be accessed via local roads outside the park, and not all of these roads are well-signed. In other cases, brown signs exist outside the park, but there is no indication that the signed destinations are part of the park.

Travel around and within the park does not appear to be a challenge. The park staff did not comment about issues with congestion or high incident locations anywhere in the park. In fact, there was praise given to the staff involved with getting traffic into and out of the park for special events such as the Storytelling Festival. There were comments made about spaces in lots closest to a particular destination getting filled early on weekends due to visitation, but overall parking does not appear to be an issue either. While the park discussed challenges in maintaining trails, the *Visitor Study* indicated an overall satisfaction with trail conditions throughout the park.

Given the size of the park and great number of access points, providing opportunity for park staff to interact with visitors is challenging at times. The primary visitor and information center is at Bandy Creek and the park has worked to expand its reach. A previously unused property in Stearns has been rehabbed to provide a Kentucky base for ranger operations and is staffed by a ranger on summer weekends. The town of Rugby has worked to develop a partnership with the park and has provided space in the downtown area which the park staffs summer weekends as well. Lastly, the park owns roughly 20 acres just west of Oneida that could be used as visitor center and intercept location, offering parking and connections for tour buses and outfitters. The park has a partnership with the Cumberland County-Crossville Tennessee Visitor Center almost 50 miles south of the park on I-40 where the park provides a NPS ranger to assist in visitor center staffing.

## **Multimodal Connections**

The park is connected to other state parks through its trail network. This includes connections to other large trail networks like the Sheltolee Trace and the John Muir National Recreation Trails. Other multimodal connections include the Big South Fork Scenic Railway that connects visitors to the park via a train ride from Stearns. Stearns is also seeking to improve connections to the park through its recent Trail Town designation.

## **Mode of Access**

Nearly all visitors to Big South Fork NRRA arrive by private vehicle. A small number may hike in from other surrounding parks, but this number is difficult to determine. The other primary mode of access would be rail from Stearns. There are no opportunities for access via public transportation. Depending on the water level in Cumberland Lake, boaters may travel up the Cumberland River into the north end of the park. Additionally, it is possible to put in to upstream creeks and rivers and float into or through the park.

## Resource Protection

### Historical, Cultural, and Natural Assets

Protecting natural resources within Big South Fork NRA can be challenge in providing recreational access to many areas of the park. There are a number of historic and cultural resources located within the park relating to the region's prominence in coal mining and connections to the Civil War as well. The park does a good job of informing the public about these resources and providing access through interpretive sites. As the park was all previously private land, elements of that history remain and some require private access, such as cemeteries.

The park also accommodates a wide range of user groups that can sometimes be at odds with one another. Efforts to maintain the area as a hunting location for people who feed their families with the game they catch or kill. Ensuring that as park visitation increases for other uses like mountain biking and hiking that hunters aren't impacted will be an area the park may need to devote focus moving forward.



Clockwise from top left: Charrit Creek Lodge; Train tippie at Blue Heron Mining Community; Big South Fork River; old farm house

### Negative Resource Impacts

Big South Fork NRA faces a number of challenges in its efforts to preserve historical, cultural, and natural resources within the park. The park expects visitation to grow as more people participate in outdoor and adventure recreation activities. Accommodating the growth in trail and river traffic without disturbing or destroying the park's natural resources will be a challenge. The biggest challenge will be in maintaining the trail network from deterioration associated with daily use and limited resources. The park is implementing improvements to the river crossings of some trails to reduce the impact to the river bed and any species that may be negatively impacts. Other concerns were raised about the population of black bear and elk increasing as a result of the repopulation efforts underway, and potential interactions with vehicles and visitors in the park.

Park staff expressed concern about climate change impacts on the park transportation system, most notably in the form of trail upkeep. Recent increases in winter weather events have results in a greater number of downed trees each year. An ice storm a couple of years ago brought down hundreds of trees that ended up blocking roads and trails. The effort involved in clearing the trees was very large and could become a regular occurrence if this recent trend continues.

The park is rich in oil and mineral reserves. Much of the coal has been mined, but the evidence of the mines remain. The park is regularly finding new mine entrances and has undergone a project in recent years, primarily funded by ARRA funds, to seal mine entrances to minimize risk to the public. At the same time, many of the mines have begun to leach. The leachate is highly acidic and can contain heavy metals, and thus has the potential to impact other natural resources. Staff regularly monitor leaching mines and have projects to mitigate several. Several of the leaking mines are adjacent to roadways so mitigation would include handling road stormwater as well as the leachate.

The park also has the highest number of oil and gas wells of any unit in the Park Service. While many are active, many more are no longer producing. The producing wells require access by the operators. In recent years, also with ARRA funds, the park has worked to cap many of the abandoned wells, seeking to minimize environmental risk or potential hazard to park visitors.

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# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



### Blue Ridge Parkway September 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at the Blue Ridge Parkway in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the SER LRTP effort, SER staff have identified nine Focus Park units that are representative of the broad range of units in the region. The SER LRTP core project team will visit each of these Focus Parks over the course of several months at the start of the LRTP effort to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 park units within the Southeast Region, each focus park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

The second of the nine Focus Park visits took place at the Blue Ridge Parkway on September 8-9, 2014. The visit included conversations with park staff as well as park tours and field reviews to observe firsthand specific transportation assets and conditions. The site visit was attended by the following individuals:

- Dawn Leonard, Blue Ridge Parkway
- Mike Molling, Blue Ridge Parkway
- Herbert Young, Blue Ridge Parkway
- Terry McElrath, Blue Ridge Parkway
- Chris Ulrey, Blue Ridge Parkway
- Deb Flowers, Blue Ridge Parkway
- Susan Gonshor, Blue Ridge Parkway
- Michelle Peyton, Blue Ridge Parkway
- Dave Anderson, Blue Ridge Parkway
- Andy Otten, NPS Denver Service Center
- Teresa Cantrell, NPS Southeast Region
- Lewis Grimm, FHWA Eastern Federal Lands
- Chris Jaeschke, FHWA Eastern Federal Lands
- Elissa Goughnour, VHB
- Kevin Keeley, VHB

## Park Overview

The Blue Ridge Parkway is a 469-mile recreational motor road located in the central and southern Appalachian Mountains of Virginia and North Carolina. The parkway, which connects Shenandoah National Park and Great Smoky Mountains National Park, is the longest road planned as a single park unit in the National Park Service system.<sup>1</sup>

Construction of the parkway began in 1935, and proceeded in sections over the ensuing 52 years. The Linn Cove Viaduct, which stands as an engineering marvel and is a major visitor attraction, opened in 1987, marking the completion of 469 continuous miles of parkway.

According to the park's General Management Plan, the Blue Ridge Parkway was established to:<sup>2</sup>

- ❶ Connect Shenandoah and Great Smoky Mountain national parks by way of a “national rural parkway”—a destination and recreational road that passes through a variety of scenic ridge, mountainside, and pastoral farm landscapes.
- ❷ Conserve the scenery and preserve the natural and cultural resources of the parkway's designed and natural areas.
- ❸ Provide for public enjoyment and understanding of the natural resources and cultural heritage of the central and southern Appalachian Mountains.
- ❹ Provide opportunities for high-quality scenic and recreational experiences along the parkway and in the corridor through which it passes.

As a recreational motor road that features a designed landscape and numerous sweeping vistas of the Appalachian Mountains, the parkway itself is a destination for visitors; it also provides access to attractions that include overlooks, waterfalls, historic sites, recreational offerings, and cultural event centers. Many visitors combine windshield tours with recreational stops at the many roadside attractions along the length of the parkway.

During the Focus Park visit, park staff stressed the importance for the Blue Ridge Parkway to maintain a visitor experience as envisioned by the parkway's founders; however, that vision is increasingly difficult to sustain given the increasing development pressures and resulting congestion on the parkway. In addition, reduced staffing and funding levels have led to underinvestment in maintaining the park's cultural landscape.

The following sections of the report provide further details on the park's transportation conditions, challenges, and needs based on the conversations with park staff and field observations gleaned during the Focus Park visit.

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<sup>1</sup> Blue Ridge Parkway: Summary of the Final General Management Plan, Oct. 2013, p. 4.

<sup>2</sup> Blue Ridge Parkway: Summary of the Final General Management Plan, Oct. 2013, p. 8.

## Asset Management

### Transportation Assets

#### ROADS

At 469 miles in length, the motor road itself is the park's most prominent and most important transportation asset. The Blue Ridge Parkway consists of far more than just the motor road, however; with 3,107 transportation assets, it has the most extensive transportation system of any park unit in the Southeast Region. The park maintains 10 percent of all roadway miles in the NPS system, 11 percent of all NPS bridges, and 43 percent of all NPS road tunnels.

The park maintains 542 miles of paved roadway, including the motor road. In addition to the 469 miles of motor road, the park maintains some access roads as well as additional roadway infrastructure at 21 recreation and developed areas. Of the 21 recreation and developed areas, nine are located in Virginia and 12 are located in North Carolina:

#### Virginia:

- Humpback Rocks (MP 6-10)
- James River / Otter Creek (MP 60-65)
- Peaks of Otter (MP 82-91)
- Roanoke Mountain (MP 118-122)
- Smart View (MP 155)
- Rocky Knob (MP 166-174)
- Mabry Mill (MP 176)
- Groundhog Mountain (MP 189)
- Blue Ridge Music Center (MP 213)

#### North Carolina:

- Cumberland Knob (MP 217-219)
- Doughton Park (MP 236-247)
- Jeffress Park (MP 272)
- Moses H. Cone Memorial Park (MP 294)
- Julian Price Memorial Park (MP 295-300)
- Linn Cove Viaduct (MP 305)
- Linville Falls (MP 315-319)
- Museum of North Carolina Minerals (MP 331)
- Crabtree Falls (MP 339-340)
- Craggy Gardens (MP 364-369)
- Mount Pisgah (MP 407-409)
- Waterrock Knob (MP 451)

The park also maintains 26 tunnels, 25 of which are located in North Carolina.

The Blue Ridge Parkway has more than 250 access points, 199 of which are public secondary at-grade access points and 30 of which are primary grade-separated access points. The remainder are private roads and driveways that intersect the parkway.

The posted speed limit on most of the parkway is 45 mph; notable exceptions can be found in commuter corridors, where some motor road segments have a posted speed of 35 mph. The motor road features no edge stripe in an effort to maintain the rural character by the parkway's designers, allowing the pavement to better blend with the adjacent topography. The lack of edge stripes has been the subject of debate among staff, some of whom believe that installing an edge stripe would improve safety on the parkway, and others who feel that an edge stripe would adversely impact the parkway's historic character and would have an impact on the cultural landscape. The Blue Ridge Parkway has been nominated as a national historic landscape and must be managed as though designated.

According to a Preliminary Transportation Needs Assessment completed in September 2014, the park's most pressing transportation needs are budget constraints and deferred maintenance; transportation asset condition; adjacent development pressures; congestion on the parkway and at parking areas; safety, including intermodal conflicts; and a lack of reliable data on traffic and visitation patterns.<sup>3</sup>

Notable planned roadway improvements in the park include:

- Bridge replacement and anticipated realignment of the parkway due to the widening of I-26 in Asheville. Plans are in development.
- Repair and rehabilitation of the triple-arch bridge over the Linville River, estimated at \$1.4 million. Scheduled for 2017.
- Rehabilitation of the Roanoke River Bridge, estimated at \$5.3 million. Scheduled for 2017.
- Repair and rehabilitation of Linn Cove Viaduct, estimated at \$2.8 million.
- Rehabilitation of Buck Spring Tunnel (MP 407) in 2015-16.
- Full-depth reclamation paving of parkway sections 1B, 1C, 1D, 1E, and 2F.



The Blue Ridge Parkway motor road.

## PARKING AREAS

The Blue Ridge Parkway maintains 511 parking areas and overlooks.<sup>4</sup> Parking is free of charge throughout the park.

According to staff reports, there are numerous locations where the capacity of parking lots is insufficient to meet demand. The most acute parking issues can be found at Graveyard Fields, Bass Lake, Linville Falls, Peaks of Otter, and the picnic area at Price Park; parking regularly exceeds

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<sup>3</sup> Preliminary Transportation Needs Assessment for the Blue Ridge Parkway, September 2014, pp. 12-22.

<sup>4</sup> Preliminary Transportation Needs Assessment for the Blue Ridge Parkway, September 2014, p. 12.

capacity at each of these locations. Graveyard Fields' parking area still does not have enough spaces to meet demand despite a recent expansion that doubled historic capacity. When parking lots are full, visitors will park wherever they can find space for their vehicle, including the roadside or, in the case of Bass Lake, in the traffic circle. Parking issues along the parkway become particularly dire during peak visitation periods in the fall.

The park hosts numerous events, which often put a strain on parking facilities and result in informal roadside parking. For instance, Sunday afternoon concerts at Mabry Mill attract relatively large crowds and lead to congestion in the parking lot. Park staff report that programming is limited by parking capacity.

Staff also reported issues with visitors parking in lots for extended periods of time; for example, cyclists will often stage from the Cone House parking lot and will leave their car for the day. This parking area regularly fills up, with visitors parking on the roadside when they can't find available spaces in the lot.

In addition to informal overflow parking at recreation and developed areas, staff have identified numerous informal parking locations along the parkway, many of them used by visitors seeking to access trails adjacent to the parkway. The most prominent example is in the "Asheville Corridor" where there are approximately 40 informal parking areas—all of which are causing resource damage, erosion, and unsafe conditions. The park has studied and completed public scoping to formalize some of these parking areas by developing parking "overlooks" in locations that will provide trail access; all other informal parking areas in the corridor will be closed.



Informal roadside parking along the Blue Ridge Parkway near the interchange with U.S. 74-A in Asheville.

Several locations on the parkway are signed with "No Parking" signs that are regularly ignored by visitors. Park staff report that there are not enough LE Rangers to enforce these parking restrictions.

## **PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES**

There are 369 miles of trails and four FHWA-inspected trail bridges within the Blue Ridge Parkway boundary. The trails serve recreational purposes and also provide access to overlooks, waterfalls, cultural and historic sites, campsites, and picnic areas, and connections to US Forest Service trails, North Carolina State Parks trails, the Appalachian Trail, and the Mountains-To-Sea Trail.

The highest concentration of trails can be found at Cone Park, which features 25 miles of carriage trails for use by pedestrians, horses, and horse-drawn carriages.

The Appalachian Trail parallels the northern end of the Blue Ridge Parkway in Virginia for approximately 110 miles. The Mountains-To-Sea Trail parallels the parkway for approximately 200 miles in North Carolina. The trail, which was designated in the 1980s, was intended as a long-distance trail, but more often acts as a local recreation resource. The trail shares river and stream crossings with the parkway in numerous locations. Despite the fact that both the Appalachian Trail and the Mountains-To-Sea Trail cross the Blue Ridge Parkway at grade in multiple locations, there are no marked crosswalks on the motor road.

The Middle Fork Greenway, which will provide a trail connection between Boone, NC, and Blowing Rock, NC, is currently under construction and will be completed in six phases over several years. The Greenway will provide access to the Blue Ridge Parkway just north of Blowing Rock.

The Roanoke Trail Plan currently in draft form outlines the future of trail use in the Roanoke Corridor between mileposts 110 and 126. The trail plan considers mountain bike use at Virginia's Explore Park as well as numerous greenway connections.

Most trail maintenance in the park is performed by volunteers, as the National Park Service does not have dedicated funding for trail maintenance. Park staff reported that waysides on trails are not well maintained and generally are in poor condition.

The Blue Ridge Parkway is a very popular destination for bicyclists, who are drawn by the magnificent views and the challenging terrain. Anecdotally, bicycle traffic on the parkway has increased substantially over the past decade. Bicyclists are permitted to ride on the motor road, as NPS policy prohibits off road bicycling unless specifically authorized on particular trails. There are no bicycle facilities on the parkway.

Bicycling poses challenges for the park, in terms of both planning and partnerships. Bicycle traffic on the parkway has increased dramatically in recent years, according to park staff, and cycling and tourism groups have increasingly been promoting the parkway as a destination for avid cyclists. The park, while allowing bicycles to use the motor road, is unsure whether it wants to encourage additional bicycle traffic on the parkway due to concerns over safety and visitor experience.

## **ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)**

A park concessionaire operates a shuttle bus five days a week on a seasonal basis at Peaks of Otter in Virginia. The shuttle seats approximately 25 passengers, and costs \$8 roundtrip. Park staff report that ridership is low, with the exception of peak season in October.

## **OVERLOOKS AND VISTAS**

The Blue Ridge Parkway maintains 382 overlooks along the motor road, of which 215 have managed vistas that provide a viewing opportunity for visitors. In addition to overlooks, the

parkway maintains another 613 roadside vistas and 61 canopy vistas through a vista contract, for a total of 889 maintained vistas. One-third of the managed vistas are cut each year, so a portion of each vista is cut once every three years. Park staff reported having difficulties keeping up with mowing and vista maintenance; those difficulties, along with the impact of mature trees on vistas, have led to visitor complaints. According to park staff, vistas are the “number one reason” visitors come to the park, and issues related to vista maintenance are the number one visitor complaint.

## **DATA**

According to park staff, the Blue Ridge Parkway has eight working traffic counters. Other counts are done manually; for instance, interpretive staff members keep counts at the Linville Falls parking area.

Staff mentioned their goal of developing a plan for upgrading their traffic counting capabilities, which would both determine the best traffic counting technology for the park and identify the best locations for placement of counters.

Park staff also expressed a need for count data for motorcycles and bicycles.

## **Partnerships**

### **ROADS**

The Blue Ridge Parkway maintains formal partnerships and strong relationships with a number of public and non-profit entities that are dedicated to increasing tourism and economic development in the region. The Blue Ridge Parkway Association (BRPA) is a membership organization that works with the NPS and local businesses to promote the parkway in an effort to increase park visitation and boost support of local businesses. The BRPA has developed an app that visitors can use to find services along the parkway. The park also works closely with a number of county tourism agencies, which often use NPS data in their grant applications.

The park has several other formal partner groups which provide project support: Eastern National, which provides merchandise and financial support for the park; the Blue Ridge Parkway Foundation, which provides yearly funding for on the ground projects; and the Friends of the Blue Ridge Parkway, which provides volunteer support and some financial assistance.

The park has an MOU with the Federal Aviation Administration that provides the FAA access to a radar installation via park roads. The park also has an MOU with Mount Mitchell State Park, which is accessible only via the parkway.

The park has strong working relationships with local police and fire and rescue agencies, and provides emergency response access to NPS roads. Local law enforcement will sometimes assist the park with enforcement on the parkway; however, the park’s LE Rangers recently have had some issues communicating due to lack of compatibility with some neighboring counties’ recently upgraded radio systems. The park is currently trying to obtain funding to upgrade to a radio system that is compatible with local systems.

One example of these close partnerships is DUI enforcement. LE Rangers in the Highlands District have successfully partnered with local law enforcement to perform DUI enforcement on the parkway around Boone and Blowing Rock. The park works with the Sheriff’s Department, Appalachian State University police, and the Fire Department to set up a series of checkpoints once a year. In the first year that the checkpoints were instituted, they issued 10 DUIs; two years later, no DUIs were issued at the checkpoints. Park staff reported that they have seen a sizeable increase in the use of taxis services and designated drivers in the area

## PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES

The Blue Ridge Parkway works with a number of partner organizations to keep its trails in working order. The Friends of the Blue Ridge Parkway is an approved partner organization that performs trail maintenance and provides staffing for events on the parkway. The Friends group is based in Roanoke and is organized by chapter along the length of the parkway. The Carolina Mountain Club and the Friends of the Mountain-To-Sea Trail also perform trail maintenance for the park. Park staff reported that they have a good working relationship with the superintendent of the Appalachian Trail.

The parkway has a strong relationship with the U.S. Forest Service, whose extensive trail system provides access to the parkway in numerous places. Park staff are looking to increase cooperation with county planning departments, many of which have begun developing recreation plans and want to establish trail connections to the Blue Ridge Parkway.

The park recently opened discussions with a private landowner about a potential rails-to-trails project in a former rail bed in Virginia.

A number of outside groups have moved forward with formal efforts to promote the parkway to cyclists. For example, the Adventure Cycling Association is trying to get Blue Ridge Parkway designated as a national bike route, and has gotten some surrounding counties and the Virginia Department of Transportation on board with the idea. The Virginia Department of Natural Resources, meanwhile, proposed to designate 50 miles of the parkway as part of a Beaches to Bluegrass Trail. Most times, these groups do not involve the NPS until late in the planning process which creates challenges for the successes of these projects.

The Blue Ridge Parkway is signed as a bike route in multiple locations, although the park has not authorized doing so. The North Carolina Department of Transportation installed bike route signs on multiple segments of the parkway without consulting park staff.



A bike route sign on an access road to the Blue Ridge Parkway in North Carolina.

## **PLANNING**

The Blue Ridge Parkway completed a Final General Management Plan and Environmental Impact Statement in October 2013, marking the first comprehensive planning document in the parkway's history. The GMP / EIS is intended to guide management of the Blue Ridge Parkway over the next 20 years.

The parkway recently worked with the Denver Service Center to develop a Preliminary Transportation Needs Assessment, which was completed in September 2014. The needs assessment examines the parkway's transportation system in greater detail than the GMP / EIS, and identifies pressing transportation needs and offers preliminary recommendations for addressing those needs.

Counties in Virginia and North Carolina are supposed to review their comprehensive plans on a periodic basis; however, many of the 29 counties adjacent to the Blue Ridge Parkway don't have dedicated planning staff, which can make it challenging for the NPS to align their planning efforts with those of local jurisdictions.

## Sustainable Operations

### Environmental Sustainability

The Blue Ridge Parkway has an active land acquisition program that helps preserve landscapes along the parkway. Land acquisition authority can also be used to extinguish road access to the parkway, although they have not been used for that purpose to this point.

The Blue Ridge Parkway is home to the Northern Flying Squirrel, a protected species. For much of the early 2000s, the park struggled to balance protection of the flying squirrel and the park's vista maintenance needs. The park completed an environmental assessment in 2010 that led to changes in the way it manages vistas and has allowed the park to resume vista maintenance while also maintaining the squirrel habitat.

Park staff are working to contain invasive plants throughout the park. Staff report that roads are vectors for invasive plant species getting into the park. Staff are also seeing increased wildlife populations in the park, due in large part to development pressures in surrounding areas. As the land around the parkway becomes more fragmented and urbanized, the Blue Ridge Parkway itself become a wildlife corridor.

### Financial Sustainability

#### FUNDING

A consistent theme voiced by park staff during the Focus Park visit was chronic underfunding of transportation needs in the park. Staff reported that 230 miles of the parkway—or nearly half of the entire length of the motor road—has not been resurfaced in more than 20 years. Many segments of the motor road have not been resurfaced in more than 30 years. The park competes well for available funding; the issue is that the available funding—in particularly 3R funding (within FLHP Category I funds) for roadway repair, repaving, and minor rehabilitation—is not sufficient to meet the park's needs. As an example, staff pointed to a paving project on a segment of roadway near Blowing Rock that hadn't been resurfaced in nearly 30 years; funding issues forced the park to shorten the project by 8 miles.

The park programs between \$7 million and \$10 million annually for roadway maintenance, which is not nearly enough to meet needs, according to park staff. As a result, deferred maintenance (DM) continues to grow annually. The park's total DM figure of \$106.4 million puts it in the top five for DM in the entire NPS system.

The park uses cyclic money for vista maintenance, which is done through a contractor. The park lost the capacity to cut vistas in-house more than 20 years ago. Staff report that the park has historic viewsheds that are no longer viewable due to mature growth and lack of maintenance. Park staff are currently exploring many alternatives to complete vista restoration plans and develop a maintenance schedule to protect the viability of this important recreational asset.

Emergency roadway repair has become a more pressing need in recent years; the park has had major slides in each of the past two years. Each of the slides cost more than \$5 million to repair. The park relies on Emergency Relief for Federally Owned Roads (ERFO) for emergency repairs, but ERFO funding does not always cover all of the park's emergency needs. When ERFO funding is unavailable, the park uses 3R funding. ERFO funding is allocated by NPS Southeast Region and FHWA's Eastern Federal Lands Highway Division.

Park staff said that they would like to be more proactive in their roadway maintenance. Drainage structure degradation is an issue, and can play a role in catastrophic failure of the motor road. Lack of maintenance of ditches has led to ponding, and contributes to roadway degradation and to slides. As one park staff member said: “Maintaining ditches is maintaining the road.” The park used to clean all drainage ditches annually, but now clean them once every three or four years due to budget and staffing constraints. Staff reported that it is often easier to secure \$5 million to repair a slide than to secure \$1 million to clean ditches. Global warming which may lead to more frequent high intensity rain events could stress an unmaintained ditch and subsurface drainage system in the future.

## STAFFING

The Blue Ridge Parkway employs 89 full-time and 59 part-time maintenance and operations (M&E) staff, a workforce that staff attending the Focus Park visit called “skeletal” relative to the sizeable asset portfolio for which it’s responsible. Staff levels have been declining steadily over the past 10 years, and have not been fully restored since sequestration.

Maintaining such an immense inventory of transportation assets is the primary challenge faced by the Blue Ridge Parkway. The park dedicates 35 percent of work hours to maintaining the road, but the condition of the park’s transportation assets continues to decline. The impacts of chronic understaffing are apparent when one drives the parkway, according to staff: rutting on the road edge, graveling on the motor road, overgrown vistas, degraded drainage structures, hazardous trees, and faded striping. Those impacts can also be seen in staff morale. One park staff member, in discussing the pride that M&E staff have always taken in maintaining the parkway’s natural beauty, said that field M&E staff are “beating themselves to death” over the current condition of the vistas and transportation assets.



Examples of poor pavement condition and overgrown vegetation along the Blue Ridge Parkway.

## Safety

### Vehicle Crashes

According to a road safety audit conducted on the Blue Ridge Parkway in 2012, the park experienced 5,790 total crashes, including 69 fatal crashes, between 1990 and 2005. The motor road has a higher fatality crash rate when compared to state fatality rate data for two-lane rural roadways in North Carolina. The parkway has the highest total number of crashes of all parks in the NPS Southeast Region and accounts for 34 percent of all severe crashes in parks in the region.

Park LE Rangers reported that many crashes are due to drivers not giving time and attention to the road likely caused by vista viewing (the parkway motor road was designed with more spiral curves, shorter tangents and tighter radius than most secondary roads so more time and attention is necessary to the road surface than a state secondary road). In an effort to curb distracted driving, the park launched a public education campaign encouraging drivers to “enjoy the views, watch the road.” In addition to vistas leading to distracted driving, the placement of overlooks can pose a safety issue as well (placement of vistas can also be a safety measure by providing sunlight to pavement during winter icing), as overlooks often are located on blind curves that make for difficult ingress and egress. Vehicles backing into the motor road from overlooks and parking areas has resulted in rear-end crashes on several occasions.

The park has reduced posted speed limits on multiple segments of the parkway in an effort to improve safety. Based on crash experience that LE Rangers attribute primarily to commuter traffic traveling at high speeds on the motor road, the park recently reduced the posted speed from 45 mph to 35 mph on a parkway segment in the Asheville corridor. Anecdotally, the reduction in posted speed has led to reduced crash rates in the area. Staff is currently studying lowering the speed limit in the Roanoke Commuter corridor.

Pavement conditions—including edge rutting and graveling in the roadway—are particularly troublesome for motorcycles. Park LE Rangers reported that erosion of the pavement edge may be contributing to some motorcycle crashes.

Weather conditions frequently make for hazardous driving conditions on the motor road. Dense fog is relatively common along the parkway, and can severely limit sight distance. Snow and ice make for treacherous travel conditions during winter months, particularly at higher elevations and in places that receive limited direct sunlight. Park LE Rangers rely heavily on gates to manage traffic during major weather events or if there is icing on the roadway (and during emergency response to serious crashes). It is not unusual for some motor road segments to remain closed for extended periods of time due to icing. The parkway is signed with notifications to “Avoid the Parkway Motor Road during adverse weather.” Local traffic may ignore this warning more frequently than visitor traffic.

Visibility in tunnels is another concern along the parkway. There is no lighting inside the tunnels, although they are equipped with wall reflectors. The park has explored ways to install daytime lighting in tunnels, although it has not yet done so. Motorcyclists and bicycles in particular struggle with visibility in tunnels, as their sun visors can severely impact their ability to see. During dense fog events, fog inside tunnels can also impair visibility. White edge profile striping is one suggested solution to prevent vehicle/tunnel wall collisions and improve vehicle/bicycle safety. More highly reflective wall delineators have been implemented in tunnels in recent years and have greatly improved wall visibility. Bicycle signs have recently been installed at tunnel entrances to alert motorists that tunnels are used by bicyclists.

Motorcycle safety and noise is a serious concern at the park. According to staff, most motorcycle crashes are due to roadway geometry, distracted driving, edge rutting, excessive speed, or some combination thereof. The parkway features a number of decreasing radius curves following long downhill grades, which can create dangerous conditions for motorcyclists with limited experience or traveling at high speed.



Left: Motorcyclists navigating a curve near the southern end of the parkway.  
Right: An example of edge rutting along the motor road.

Park staff have found that the use of steel-backed timber guardrail has not only reduced fatalities but has reduced crashes in general, as the visibility of the guardrail draws drivers' attention to the curve in the roadway. This may be true for vehicles but not necessarily for motorcycles.

## Intermodal Conflicts

### MOTOR ROAD

One of the most common intermodal conflicts on the Blue Ridge Parkway involves bicyclists and passenger vehicles and oversized vehicles such as motor homes. With no bicycle lanes on the parkway, bicyclists must ride in the motor road. This can lead to conflicts with motor vehicles, particularly in steep segments where speed differentials between motorized and non-motorized traffic become more pronounced. In some cases, drivers can become frustrated when they are forced to reduce speed due to a bicyclist in the roadway, and as a result they compromise their safety in their attempt to pass the bicyclist or slow motor home.

Edge rutting poses a risk to bicyclists, particularly when they attempt to move to the edge of the roadway to allow motor vehicles to pass. Bicycles also have been involved in serious crashes in tunnels, due in part to the lack of lighting; on multiple occasions, bicyclists have entered tunnels and then have been struck while attempting to make a U-turn after becoming alarmed by the tunnel lighting levels. This may have been avoided if the bicyclist had had the required lighting on their bikes.

With bicycle traffic on the parkway continuing to grow, park staff anticipate that conflicts between motorized and non-motorized vehicles will continue to pose a major safety concern in coming years.

Intermodal conflicts are common at overlooks and parking areas. This can cause dangerous conditions at informal roadside parking locations—particularly at the numerous popular vistas and trailheads located on blind curves—with vehicles, bicyclists and pedestrians all using the motor road simultaneously. One of the most notable such locations is at Reed Gap in Virginia, which is located on a blind curve and features relatively high bicycle volumes, both a formal parking area and informal roadside parking, and heavy use by pedestrians accessing the Appalachian Trail and other wilderness recreational opportunities. Exacerbating the situation is the fact that vehicles must back out into the roadway in order to exit the parking area. These conflicts at Reed Gap occur along a state road that crosses the parkway at grade and not on the parkway motor road itself. In a recent road reconstruction project along the section of Parkway that includes Reed Gap, the Parkway was unable to fund a repaving improvement to the trail head parking area at Reed Gap.

The park also sees intermodal conflicts during winter storm events, when visitors like to recreate on closed sections of the parkway. Park staff noted multiple instances of pedestrians unexpectedly encountering heavy vehicles—such as plows, maintenance vehicles, or patrol cars—while walking in the roadway behind closed gates during a road closure.

Conflicts due to speed differential on the motor road are not limited to intermodal conflicts; the park also experiences conflicts between different user groups in motorized vehicles. This most often entails conflicts between commuter traffic and recreational traffic. It also can involve passenger vehicles and farm vehicles on the parkway. Motorcycles many times ignore pavement markings and pass other motorcycles or cars in locations with limited sight distance.

### PARKING

Park staff reported that intermodal conflicts are common in parking areas. The Cone Manor House parking area, where demand regularly exceeds the capacity of approximately 20 spaces, has had numerous rear-end crashes. The parking area at Graveyard Fields in North Carolina, which features a mix of uses and is one of the most popular overlooks in the park, has numerous conflicts due to congestion in the parking lot and roadside parking.

## User Experience, Mobility, and Access

### Visitation

According to park staff, the Blue Ridge Parkway receives between 14 million and 16 million total visitors per year, making it the most visited unit of the National Park Service system. The parkway experiences its highest visitation during the summer months and during the fall peak foliage season, with July and October typically the busiest months. More than 2 million people visited the Blue Ridge Parkway in October 2014.<sup>5</sup>

The parkway features 14 Visitor Centers, 11 of which are located in North Carolina. Two Visitor Centers are open year-round: the Blue Ridge Parkway Visitor Center and Park Headquarters in Asheville (MP 384) and the Museum of North Carolina Minerals Visitor Center (MP 331). Approximately 10 percent of Blue Ridge Parkway visitors enter a Visitor Center during their stay in the park.

The most visited locations along the parkway include the Peaks of Otter, the Linn Cove Viaduct, Mount Pisgah, the Folk Art Center, Linville Falls, and the Moses Cone Estate.<sup>6</sup>

### Mobility and Visitor Experience

#### CONGESTION

Although it was designed as a bucolic motor road intended to serve recreational driving, the Blue Ridge Parkway has become an integral part of the local and regional transportation system. As a result, the park features uses that likely were not envisioned or intended by the parkway's creators.

The highest levels of congestion on the parkway occur in the Asheville and Roanoke metropolitan areas; parkway segments in these areas feature relatively high volumes of commuter traffic during weekday peak periods. Park staff also identified Blowing Rock and Linville as an emerging area that has seen increasing levels of commuter traffic. According to traffic counts, the three most heavily traveled portions of the parkway are located in the Asheville corridor: Blue Ridge Parkway at U.S. 25; Blue Ridge Parkway at U.S. 70; and Blue Ridge Parkway at U.S. 74.<sup>7</sup> Anecdotally, commuter traffic may be impacting visitor experience in the Roanoke area, with staff reporting that number of traditional parkway users appears to have declined that commuter traffic now accounts for the majority of motor road users in the Roanoke corridor.

In 2013, non-recreational visits accounted for 15 percent of the Blue Ridge Parkway's total visitation of 14.8 million.<sup>8</sup>

Non-recreational traffic on the parkway has significant impacts on visitor experience, as it leads not only to congestion but to conflicts between recreational and non-recreational visitors. The park has reduced posted speed limits in multiple segments in an effort to both improve safety and discourage commuter traffic. Staff stressed the need for the park to get creative in its efforts to address commuter traffic, reduce congestion levels on the parkway, and improve visitor experience. Several staff members also expressed the belief that the park's transportation planning

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<sup>5</sup> NPS Stats.

<sup>6</sup> *Preliminary Transportation Needs Assessment for the Blue Ridge Parkway*, September 2014, pp. 10-11.

<sup>7</sup> NPS Stats.

<sup>8</sup> NPS Stats.

efforts need to better address the parkway's carrying capacity. The park could reduce commuter traffic in the Asheville area by eliminating an access at US 25 Hendersonville Road and in Roanoke by eliminating access at US 221.

The park is also seeking to reduce the amount of commercial traffic on the parkway. While commercial traffic is not permitted on the motor road, tractor trailers can end up on the parkway—despite clear signage about the commercial traffic ban—due to faulty GPS devices directing them into the park. Staff have been working with GPS data providers to try to improve the data for park roads, but have not had much success to date. Staff also noted a recent increase in non-recreational trailers (e.g. landscaping vehicles) on the parkway, and are considering a trailer-use regulation similar to that used by Natchez Trace Parkway.

The many events staged on the Blue Ridge Parkway, while enhancing the visitor experience for some, have a sizeable impact on the transportation system and can lead to increased levels of congestion. The two events with the most significant impact are the Roanoke Marathon, which takes place in April and includes portions of the motor road and Roanoke Mountain Road, and Floyd Fest, a five-day music festival that takes place adjacent to the parkway and uses the motor road for event access. Park staff estimate that each of these two events, both of which take place in Virginia, puts an additional 25,000 vehicles on park roads. The park deploys temporary signage during events to improve wayfinding and to manage traffic.

Wayfinding can be an issue for visitors who rely on GPS or other smartphone-based technology, as cell phone coverage tends to be spotty in the park. No facilities exist within the parkway for gas or vehicle repairs and only one restaurant is currently open along the 469-mile route, thus requiring visitors to seek these services in neighboring communities.

## **DEVELOPMENT PRESSURES**

The Blue Ridge Parkway has a complex assortment of neighbors with which it must coordinate in attempting to maintain the natural beauty and sweeping vistas intended by the parkway's founders. These neighbors include the U.S. Forest Service, with which the park shares a full one-third of its boundary; two states; 29 counties; and over 4,000 adjacent private properties that range in size from standard suburban lots to farms to sprawling high-end resorts like the Biltmore Estate and Wintergreen Resort.

As the areas surrounding the parkway have continued to urbanize in recent decades, the park has faced increasing levels of development pressures from various neighbors. In Virginia in particular, residential and commercial development adjacent to the parkway has impacted both mobility in the park and the maintenance of historic viewsheds. The Virginia side of the parkway also features a relatively high number of driveway accesses along the motor road, and park staff reported noticing increased use of driveways for commuter access to the parkway. Development pressures along the parkway in Virginia are exacerbated by a lack of zoning in some Virginia counties.

At the northern end of the parkway, Wintergreen Resort has impacted visitor experience on the parkway, as the resort has added commuter traffic and commercial traffic to the motor road. Wintergreen has made several unsuccessful attempts to build an access road directly from the Blue Ridge Parkway into the resort, even going so far as involving National Park Service staff in Washington, DC. Despite some past challenges in working with the resort, park staff reported that they currently have a good working relationship with Wintergreen.

In North Carolina, the City of Asheville has a parkway overlay district that helps manage development pressures to some degree. The park has received pressure from NCDOT to widen several at-grade crossings of the parkway due to increased traffic volumes on secondary state

roads; these pressures stem in part from the state not maintaining sufficient right-of-way when it deeded the lands to the parkway. While NCDOT would like the park to make decisions on widening these at-grade crossings on an ad-hoc basis, the park has opted to take a more measured approach and is seeking to develop a comprehensive plan for at-grade crossings that would entail identifying the most critical crossings and making them grade-separated.

Compounding the development pressures is the attempts by neighboring jurisdictions to brand themselves as destination for outdoor recreational enthusiasts, with the Blue Ridge Parkway featured as a primary draw of any such tourism campaign. For instance, the Roanoke Valley Convention and Visitors Bureau recently launched a \$21.6 million tourism campaign, which, if successful, almost certainly will bring additional visitors to—and increase congestion on—the Blue Ridge Parkway.

With the corridor between Atlanta and Washington, DC, expected to continue its rapid urbanization over the next half century, park staff anticipate increases in visitation, development pressures, and congestion in coming years.

## **ROAD CLOSURES**

Weather-related road closures have a significant impact on visitor mobility every winter. The Blue Ridge Parkway does not use salt on its roads, and has limited sanding and plowing capabilities. Furthermore, road closures can take a relatively long time—for instance, it takes six hours to close the motor road between Pisgah and Cherokee in North Carolina. As a result, the park often will close roads based on a forecast in order to ensure public safety during severe weather events.

When the park does close roads, some user groups—most notably commuters—are highly vocal in expressing their displeasure with park staff. The park has developed a web application to notify the public of park closures, and employs digital interns to help update social media during weather events. Park Rangers have begun using photos to show roadway conditions and help the public understand why certain road segments are closed.

## Resource Protection

### Historical and Cultural Assets

The Blue Ridge Parkway is home to numerous historical and cultural assets, most notably the motor road itself. The park is presently working toward National Historic Landmark designation for the motor road and associated cultural landscape.

The park's transportation infrastructure provides access to a number of other notable assets, including major cultural offerings at the Blue Ridge Music Center in Virginia and the Folk Art Center in North Carolina. Historic transportation assets can be found at the Linn Cove Viaduct, one of the most complex concrete bridges ever constructed, and the Moses Cone Estate, which features 25 miles of carriage trails that date back to the late 19<sup>th</sup> century.

The parkway maintains a series of agricultural leases and scenic easements with adjacent landowners in an effort to maintain the rural farm character that is essential to parkway's historic designed landscape. As the land along the parkway rises in value—particularly in the urban and urbanizing corridors—the park is finding it difficult to maintain these arrangements. As a result, the parkway's historic rural landscape is being imperiled at an increasing rate, and the park is having trouble meeting its mission to provide a scenic and recreational driving experience.

### Negative Resource Impacts

In some respects, the Blue Ridge Parkway has been a victim of its own success. Its adherence to its mission of providing a rural driving experience and preserving the natural and cultural resources of the adjacent landscape have helped make it the most visited unit in the Park Service. That popularity, in turn, has led to degradation of natural resources throughout the park, and has negatively impacted its ability to meet the portion of its mission that pertains to natural resources.

For instance, when the park builds a comfort station, as it recently did at Graveyard Fields, it improves the visitor experience but also tends to induce additional usage, which can have negative resource impacts.

Informal parking on roadsides and the creation of informal trail access points has caused resource degradation in numerous areas of the park. Heavy vehicles, particularly RVs, also can have significant negative impacts on the roadway.

Staff expressed concern about the impacts of climate change and severe weather events on the park transportation system. The park regularly deals with slides, including a major slide in each of the past two years. A segment of the parkway near Spruce Pine, North Carolina, was closed for 18 months in 2005-06 due to residual impacts from Hurricanes Francis, Ivan, and Jeanne. Flooding damaged the Linville Falls Visitor Center in 2004. Staff reported that the North Carolina sections of the parkway are more vulnerable to slides due to the region's topography.

# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



## Fort Sumter National Monument

September 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at Fort Sumter National Monument in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the SER LRTP effort, SER staff have identified nine Focus Park units that are representative of the broad range of units in the region. The SER LRTP core project team will visit each of these Focus Parks over the course of several months at the start of the LRTP effort to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 park units within the Southeast Region, each focus park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

The seventh of the nine Focus Park visits took place at Fort Sumter National Monument (NM) on September 29-30, 2014. The visit included conversations with park staff as well as a park tour and field review to observe firsthand specific transportation assets and conditions. The site visit was attended by the following individuals:

- Tim Stone, Superintendent, Fort Sumter NM
- Sandy Pusey, Facility Manager, Fort Sumter NM
- Teresa Cantrell, National Park Service Southeast Region
- Kevin Keeley, VHB

### Park Overview

Fort Sumter NM is located in the City of Charleston and the Town of Sullivan's Island, South Carolina. The park preserves and interprets fortifications that played key roles in numerous battles across multiple conflicts in American history; most notable among these is Fort Sumter, best known as the site of the first shots of the American Civil War. While it was originally established to commemorate the historical events that took place at and around Fort Sumter, the park's mission has broadened to include preservation of multiple fortifications and artifacts "to interpret the evolution of U.S. coastal defense and ... the passages of slaves into America."<sup>1</sup>

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<sup>1</sup> Fort Sumter National Monument Park Asset Management Plan, 2007.

Fort Sumter NM consists of four sites around Charleston Harbor:

- Fort Sumter, located on a man-made island at the mouth of Charleston Harbor, preserves fortifications that were built in the early- to mid-19<sup>th</sup> century and that played a central role in the start of the Civil War and the defense of Charleston.
- Liberty Square, site of the park's Visitor Education Center and one of two departure points for the ferry to Fort Sumter, is located in downtown Charleston. Liberty Square is also home to the South Carolina Aquarium.
- Fort Moultrie, which preserves fortifications that served as active seacoast defenses for 171 years, is located on Sullivan's Island across the harbor from downtown Charleston. Fort Moultrie also is home to park headquarters and a Visitor Center.
- The historic coast guard station is located approximately 0.8 miles east of Fort Moultrie on Sullivan's Island, and preserves a Coast Guard station and lighthouse that provided navigation and rescue services for 95 years.

Patriots Point, located on the east side of Charleston Harbor in Mount Pleasant, SC, is the site of the second departure point for ferry service to Fort Sumter. Patriots Point is also the site of the USS Yorktown, a World War II-era aircraft carrier preserved as a museum ship and a notable tourist attraction. The USS Yorktown, along with other decommissioned military vessels, is part of the Patriots Point Naval and Maritime Museum, and is owned and operated by a public-private entity. The National Park Service does not own any land at Patriots Point.

Charles Pinckney National Historic Site (NHS) is located in Mount Pleasant, and preserves an historic property once owned by Charles Pinckney, one of the principal authors and a signer of the United States Constitution. While Charles Pinckney NHS and Fort Sumter NM are separate park units, the two parks are managed by a single superintendent.

The following sections of the report provide further details on the transportation conditions, challenges, and needs at based on the conversations with park staff and field observations gleaned during the Focus Park visit. This Focus Park visit summary will address conditions at both Fort Sumter NM and Charles Pinckney NHS.

## Asset Management

### Transportation Assets

#### ROADS

Roads account for a relatively small proportion of transportation assets at Fort Sumter NM. According to the 2007 Park Asset Management Plan (PAMP), the park owns and maintains four roads.<sup>2</sup> Most notable among these is the access road to the handicapped accessible drop-off at Liberty Square; the access road is a brick-surface roadway that constitutes the east leg of the intersection of Concord Street and Calhoun Street, just south of Liberty Square. Commercial and RV traffic is prohibited on the access road.

Charles Pinckney NHS owns and maintains two roads, neither of which carries any significant visitor traffic.

#### PARKING

Fort Sumter NM owns a paved parking lot at the Fort Moultrie Visitor Center and park headquarters on Sullivan's Island. The lot serves park visitors and can accommodate approximately 60 passenger vehicles, including five handicapped parking spaces. The lot also features three spaces for bus parking. Park staff reported that the lot often reaches capacity during peak periods; congestion can be exacerbated by the presence of five or six buses in the lot during these times.

The park owns a paved lot, used for staff parking, a block away from Liberty Square in downtown Charleston. Vehicles enter the lot from Wharfside Street. The lot can accommodate approximately 40 vehicles.

Visitors who travel by passenger vehicle to Liberty Square are encouraged to park in the city-owned Aquarium Garage located at 24 Calhoun Street, a half block from the square. The garage has a capacity of nearly 1,100 spaces, and it generally has plenty of available capacity. The rate for the Aquarium Garage is \$2.00 per hour, with a daily maximum of \$16. Bike parking is available in the garage. Motorcycles are prohibited in the Aquarium Garage. Metered street parking is also available along Concord Street in the vicinity of Liberty Square.

Patriots Point has a paved parking area that can accommodate approximately 325 vehicles, with space available for overflow parking on the grass adjacent to the paved lot. The lot also has 12 spaces for bus parking. The parking lot serves visitors accessing the Fort Sumter ferry, as well as visitors to the Patriots Point Naval and Maritime Museum. The parking lot is owned by the Patriots Point Development Authority, and is operated by a concessionaire. The concessionaire charges a \$5 flat fee for parking.

Visitors to Charles Pinckney NHS can park free of charge in the unpaved lot located on park property, adjacent to the farm house.

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<sup>2</sup> Fort Sumter National Monument Park Asset Management Plan, 2007.

## PEDESTRIAN FACILITIES

There are relatively few pedestrian facilities—and no bicycle facilities—located on NPS-owned land at Fort Sumter NM. Liberty Square, which is wholly owned by the NPS, features two wide landscaped walkways that provide connectivity to the Visitor Education Center, the ferry dock, the aquarium, and the parking garage and surrounding neighborhood.



Left: A walkway in Liberty Square, with the Visitor Education Center in the background.  
Right: Pedestrians cross Concord Street on their way from the parking garage to one of the Liberty Square attractions.

City-owned sidewalks on both sides of Concord Street and Calhoun Street provide access to Liberty Square from the parking garage and surrounding area. The intersection of Concord and Calhoun Streets includes all-way stop control, and features marked crosswalks on all four legs.

Visitors seeking to access Fort Moultrie from the Visitor Center and parking lot must cross Middle Street via a midblock crosswalk. There is an in-street pedestrian crossing sign located in the crosswalk. There is a paved walkway with interpretive plaques along the perimeter of the fort. A pair of unpaved trails leads from the vicinity of the fort to the beach.

The Charles Pinckney NHS features a number of unpaved trails that allow visitors to tour the historic Snee Farm.

## ATS

Fort Sumter is reachable only by water-based transportation; as a result, the ferry operation is the centerpiece of the Fort Sumter NM transportation network. Ferry service to Fort Sumter is provided year-round, seven days a week, with the exception of Thanksgiving Day, Christmas Day, and New Year's Day. The ferry service is operated by Fort Sumter Tours, a concessionaire.

The frequency of ferry service fluctuates by season, and is driven by demand. Fort Sumter Tours runs six ferries per day in the high season, five ferries per day in the shoulder seasons, and three ferries per day in the low season. High season runs from March 15 to August 20, and also includes Labor Day weekend. Shoulder seasons run from March 1 to March 14 and from August 21 to November 30 (Labor Day weekend excepted), and also includes the week between Christmas and

New Year's. Low season is December 1 to February 28 (except for the week between Christmas and New Year's).

Ferries to Fort Sumter depart from two locations: Liberty Square in downtown Charleston, and Patriots Point in Mount Pleasant. During high season, three ferry trips depart from each departure point. During the shoulder and low seasons, when there is an odd number of ferry trips, the Liberty Square location offers one additional trip than the Patriots Point location. As of January 2, 2015, a round-trip ferry tour costs \$19 for adults, \$17 for seniors, and \$12 for children aged 4-11. These prices represent a \$1 increase from 2014 prices. Children under age 4 ride free. Tickets can be purchased at Fort Sumter Tours kiosks at each departure site.



Top left: Park visitors boarding the ferry at Liberty Square. Top right: The Patriots Point dock, with the Fort Sumter ferry in the foreground and the USS Yorktown in the background. Bottom: The dock at Fort Sumter.

A tour features a 30-minute ferry trip to the fort, an hour at the fort, and a 30-minute return trip to the same location from which the tour departed. Only one tour group visits the fort at any given time, meaning that tours from the two departure sites—Liberty Square and Patriots Point—do not overlap. Each ferry has a capacity of 285 passengers. Park staff reported that the ferry tours generally do not reach capacity.

In 2014, the park began running Friday night sunset tours at Fort Sumter on a seasonal basis. The tours are limited to 125 visitors. The park has received very positive feedback from visitors, and plans to continue the sunset tours in 2015.

The NPS owns three docks at Fort Sumter NM: one at Fort Sumter, one along the Charleston Harbor waterfront adjacent to Liberty Square, and one along the cove adjacent to park headquarters on Sullivan's Island. The park service owns three boats, and park staff perform day-to-day maintenance. The boats go into dry dock a few times each year for more extensive maintenance.

Private boats can dock at Fort Sumter, although this is not a common practice.

Park staff stated a preference for some form of water-based ATS between Liberty Square, Patriots Point, Sullivan's Island, and Fort Sumter; however, the feasibility of such a service has not been determined, and there are no plans to institute such service in the near future.

## Funding and Partnerships

Liberty Square is owned by the National Park Service, and is located on a former superfund site that was remediated through a partnership with the City of Charleston, the EPA, and the site's former owner. In addition to being the site of the Fort Sumter NM Visitor Education Center, Liberty Square is home to the South Carolina Aquarium, which is a draw for tourists and residents from around the region. The NPS initially had targeted the aquarium site as its preferred location for visitor parking for Fort Sumter NM, but economic and political considerations led to the siting of the aquarium in that location instead.

The aquarium, which is owned and operated by a non-profit organization, is located on NPS property. The park generally has a good relationship with the aquarium, although park staff reported that the aquarium sometimes wants to do things that the park deems incompatible with the NPS mission. For instance, the aquarium wanted to build a playground in Liberty Square, an idea that was rejected by park staff.

Fort Sumter NM enjoys a good relationship with the City of Charleston. Park management in recent years has engaged the mayor's office, which has been very receptive to the park's ideas about including Fort Sumter NM in the city's broader tourism promotion efforts. At the park's request, the city has posted NPS-branded wayfinding signs to Liberty Square around downtown Charleston. The NPS also has partnered with the Charleston Visitors Bureau to promote Fort Sumter NM.

The NPS secured the historic Coast Guard facility through a land swap with the U.S. Coast Guard (USCG), in which the Park Service gave the USCG a parcel of land in Charleston in exchange for the historic facility on Sullivan's Island. The park also maintains an agreement with the Department of Defense to share use of a facility adjacent to Fort Moultrie; the U.S. Navy uses that facility for Space and Naval Warfare Systems Command (SPAWAR) operations.

The NPS does not own any land at Patriots Point, but is granted use of the parking lot and dock through an agreement with the Patriots Point Development Authority. Park staff reported that, while they have a solid working relationship with the Development Authority, the Authority's continued search for additional revenue does not always mesh well with the NPS mission.

Fort Sumter NM has an active Friends group that, among other efforts, helps fund and operate the "Kids to the Fort" program. That program brings more than 500 children from underrepresented communities to the park each year.

## Sustainable Operations

### Environmental Sustainability

Fort Sumter NM currently has two Hyundai alternative fuel vehicles in its fleet. The park is expecting to receive three alternative fuel maintenance vehicles from Natchez NHP in 2015. The park website features a link to an Alternative Fueling Station Locator website, in an effort to assist visitors with alternative fuel vehicles and promote awareness of the park's efforts to reduce greenhouse gas emissions.

In its next ferry concessions contract, the park intends to include a requirement that all ferries used for Fort Sumter tours meet USCG regulations on emissions, a more stringent emissions standard than the current standard the concessionaire must meet.

### Financial Sustainability

#### FUNDING AND FINANCIAL CONDITIONS

The ferry to Fort Sumter is operated through a concessions contract with Fort Sumter Tours, which has been the sole operator since the start of ferry operations to the fort in 1960. Park staff reported that the concessionaire feels a lot of ownership over the ferry operation, which has made the relationship between the park and the concessionaire contentious at times.

Fort Sumter Tours sued the park in the 1990s over the franchise fee that the park charged the company for its Fort Sumter ferry operations. The concessionaire lost the case, and was forced to pay a lump sum in excess of \$1 million in past due fees. Park management reported that the lump sum was spent quickly and without much forethought; in retrospect, the money would have been better spent on dock maintenance, which constitutes one of the park's most significant costs.

Although the contract with the ferry concessionaire states that the concessionaire is responsible for any damage to the Fort Sumter dock caused by the ferry, the park did not begin enforcing that clause until 2011. Previously, the park would pay for any such damage; with replacement of a piling costing \$8,000, those costs can be significant. Enforcement of the damage clause has resulted in reduced costs to the NPS and has led the ferry operator to be more careful when docking.

The park is in the process of developing a new concessions prospectus for the ferry operations, and intends to put it out to bid in 2015. In the new contract, the concessionaire will be required to maintain the docks. The contract will also stipulate that the ferries meet USCG regulations on emissions, which is not currently the case.

Park staff estimated that the ferry concessionaire grosses \$5 million annually from its Fort Sumter operations. The park charges the concessionaire a 12 percent franchise fee.

Park management has pushed Fort Sumter Tours to offer online sales, but have not been successful in doing so to date. Park staff also would like to explore the possibility of developing a package deal for tickets to Fort Sumter and to the aquarium.

The park charges a fee to enter Fort Moultrie (\$3 for adults, \$1 seniors, no charge for kids aged 15 and under). The fee can be paid in the Visitor Center, but the park does not currently make a concerted effort to collect it. Park staff estimated that a majority of visitors do not pay the fee. Park management has considered various fee scenarios, including charging a single fee for entry to Fort Sumter, Fort Moultrie, and Charles Pinckney NHS, but has not pursued any changes to its fee structure.

Park management are looking to secure some funding as part of a planned dredging project in order to build a seawall to protect the fort.

The historic lighthouse, located adjacent to the historic Coast Guard facility on Sullivan's Island, represents a major management challenge for the park. The park took ownership of the lighthouse without setting aside any funds for maintenance. The lighthouse needs approximately \$800,000 to \$1 million in repairs, but the park does not have the funds to undertake such a rehabilitation effort.

Fort Sumter NM and Charles Pinckney NHS, while two distinct units of the NPS, are managed by a single superintendent.

## **STAFFING**

The NPS employs approximately 25 FTEs total at Fort Sumter NM and Charles Pinckney NHS. The superintendent is expecting to create new positions to better align with the park's mission and with changing staffing needs; funding for those positions would come through reallocation of funds freed up through staff retirements. The park plans to fill its Fee and Revenue Management position, which has been vacant for some time, in 2015. Doing so will boost fee collection efforts and will help park management develop a more consistent and potentially more robust fee program.

The superintendent also plans to hire a Chief Ranger as soon as possible. The park has been without any law enforcement staff for nearly 15 years. The lack of a Chief Ranger has limited the park's capacity to respond to emergencies, most notably in the park's ability to remove people from the fort in emergency situations. The park has coordinated with Congaree NP to share law enforcement resources at various times in lieu of having a full-time law enforcement division.

One of the park's primary management challenges involves the transport of staff to Fort Sumter. Currently, the park ferries staff between Sullivan's Island and the fort using a 20-foot NPS-owned boat, which essentially operates as a "glorified employee shuttle." Park management would like to eliminate this practice, due to both financial and safety considerations, and instead have park staff travel to and from the fort on the concessionaire-operated ferry. In order to do this, employees would need to depart from and return to the same mainland location; however, during high season the first ferry of the day departs from Liberty Square but the last ferry returns to Patriots Point, which would make it infeasible as a means of employee transport. Park management intends to examine this issue more closely in the next year or so, and expects to make changes to staff transport to the fort soon thereafter.



The NPS boat used to transport staff to and from Fort Sumter, docked at the fort.

Park management expressed concern over the isolation of headquarters on Sullivan's Island, and lamented the fact that the park management team does not get out to Fort Sumter very often. Over time, the superintendent would like to explore options for moving park headquarters from Sullivan's Island to Liberty Square, which would bring the staff closer to the locus of the bulk of the park's visitation. The superintendent already anticipates that more park staff members will be spending more time at Liberty Square once changes to staff transport to the fort are instituted.

#### **PLANNING**

The 1998 Fort Sumter NM General Management Plan called for the elimination of the Patriots Point departure point, and consolidating ferry operations at the Liberty Square dock. Due to political considerations and community feedback, this recommendation was revisited and revised in a 2003 amendment to the GMP, which recommended retaining a second ferry departure site in Mount Pleasant.

## Safety

One of the park's primary safety concerns involves the use of an NPS-owned boat to ferry park staff between Sullivan's Island and Fort Sumter. Swift currents at Fort Sumter during tide changes make loading and off-loading of park boat very challenging. Furthermore, boats traveling from Sullivan's Island to Fort Sumter must cross the shipping channel in Charleston Bay, and the relatively small NPS boat is not easily seen by large ships navigating the channel. Inclement weather exacerbates these safety concerns. The park has become increasingly sensitive to these boat safety issues since a fatal accident involving a park volunteer disembarking from an NPS boat at Channel Islands NP in 2013.

Private boats docking at Fort Sumter is another safety concern for the park. The park plans to address this by prohibiting private boat access to the fort.

The lack of law enforcement staff hampers the park's ability to respond to emergency situations. The park maintains MOUs with local municipalities for law enforcement; however, local police can't enforce CFR regulations. In cases involving serious injury at Fort Sumter, the USCG can land a helicopter on the fort.

Most of the intermodal conflicts at Fort Sumter NM can be found in and around Liberty Square. The north leg crosswalk at the intersection of Concord Street and Calhoun Street is heavily used by visitors trying to reach the Visitor Education Center, the Fort Sumter ferry dock, and the aquarium from the parking garage. While the intersection features all-way stop control, conflicts do arise between pedestrians in the crosswalk and vehicles rolling through the stop sign. The large number of competing modes on Concord Street—private vehicles, buses, taxis, bikes, pedestrians, pedicabs, and horse-drawn carriages—contribute to the conflicts. Conflicts between pedestrians and bicyclists also occur in Liberty Square itself.

A number of safety issues at the Charles Pinckney NHS parking lot entrance—including narrow right-of-way, compromised sightlines, congestion, and the absence of a turn lane along Long Point Road—make for very challenging conditions for vehicles entering and exiting the parking lot. The City of Mount Pleasant recently removed trees to improve sight lines, but sight distance is still an issue.

## User Experience, Mobility, and Access

### Visitation

Fort Sumter NM welcomed more than 815,000 visitors in 2013, with Fort Sumter itself receiving approximately 709,000 visitors, or 87 percent of total visitation, and Fort Moultrie receiving approximately 105,800, or 13 percent of total visitation.<sup>3</sup> The park's high season runs from March through September, with April being the busiest month due to spring break and large numbers of school groups. Park staff reported that October and November, which previously had been relatively quiet months, have started to experience visitation numbers closer to those seen in peak months.

Charleston's tourism industry has grown significantly in recent years; *Conde Nast Traveler* magazine has named the city its top tourism destination in the country three years running. The uptick in tourism has led to increased visitation at Fort Sumter NM. Park staff reported that most visitors are from out of town, and include a visit to Fort Sumter NM as part of a longer visit to Charleston.

Charleston has also seen an increase in cruise ship traffic, and the park reports that cruise ship passengers make up a modest but growing proportion of park visitors.

Liberty Square features waysides with historical interpretation of Fort Sumter, the events leading up to the American Civil War, the experience of enslaved peoples in America, and the American civil rights movement. More in-depth interpretation can be found at exhibits inside the Visitor Education Center. Park staff reported that a large proportion of visitors to Fort Sumter pass through the Visitor Education Center, particularly since the ferry ticket office is located in the Center. The Visitor Education Center opened in 2002.

In addition to the historic fortifications, Fort Sumter includes a museum that features exhibits on Fort Sumter's role in seacoast defense prior to, during, and after the Civil War.

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<sup>3</sup> NPS Stats.



Top left: The entrance to Fort Moultrie. Top right: The Fort Moultrie Visitor Center.  
Bottom: Fort Sumter as seen from the water.

The Visitors Center on Sullivan’s Island was built in the 1970s, and houses exhibits and information on both Fort Moultrie and Fort Sumter. Park staff reported that a sizeable proportion of visitors bypass the Visitors Center altogether. Many visitors use the park exclusively for beach access, in which case they park in the Visitor Center lot and walk directly to the beach without stopping at either the Visitor Center or Fort Moultrie.

While Fort Sumter NM was created through federal legislation, Fort Moultrie was not originally included in that legislation; after being decommissioned in 1947 and turned over to the state of South Carolina, it was then deeded over to the National Park Service. The superintendent is in the process of trying to get legislation passed that would rename the park “Fort Sumter - Fort Moultrie National Park.” The superintendent feels that this would formalize recognition of Fort Moultrie, increase awareness of Fort Moultrie, and potentially attract more visitors to the park due to the nomenclature of National Park versus National Monument. He cited the example of Congaree National Park, which immediately saw a spike in visitation after changing its name from Congaree Swamp National Monument.

Park staff reported that they recently installed a single wayside at Patriots Point. Previously, there was no indication at Patriots Point that visitors were accessing an NPS site.

Charles Pinckney NHS, which hosted approximately 47,000 visitors in 2013, receives far less visitation than Fort Sumter NM. The superintendent of the two parks is looking to increase cross-promotion in an effort to raise awareness of and visitation to Charles Pinckney NHS.

## **Mobility and Visitor Experience**

The ferry ride to and from Fort Sumter features an NPS-approved audio, which includes a safety message and interpretation. The park tries to place an NPS representative—whether a ranger, a Student Conservation Association representative, or a volunteer—on board every ferry. The park offers a 15-minute ranger-led tour of the fort, followed by a self-guided tour. The park receives some complaints that the amount of time allotted for touring the fort is either too short or too long; however, park staff reported that the vast majority of visitors are happy with the one-hour time allowance at the fort.

Park staff estimated that approximately 60 to 65 percent of visitors to Fort Sumter depart from Liberty Square, with the remaining 35 to 40 percent departing from Patriots Point. Each departure point can draw different types of visitors. For instance, due to its colocation with the Naval and Maritime Museum, the Patriots Point departure location attracts many visitors interested in military history. Liberty Square, meanwhile, is the preferred departure point for most school groups and cruise ship passengers.

Park staff referred to the dock at Fort Sumter as “keystone” for the park’s transportation system. If the dock were to fail, the park would lose the ability to get visitors to the fort, and thus would lose most of its visitation. If park staff were to design a new dock, they would make a few notable improvements: it would be designed to accommodate larger boats; and it would be designed to improve accessibility for visitors with disabilities.

Accessibility at the fort is an issue that the park deals with on a continual basis. The elevator at the fort is out of service—with no plans to fix it due to lack of funds for repair and maintenance—so visitors with disabilities cannot access the second level of the fort, including the fort museum. There is a lift on the fort dock that provides wheelchair access from the ferry to the dock; however, the lift cannot be used at very high or very low tides due to excessive height differentials between the dock and the boat. Park staff emphasized the difficulty of maintaining accessibility in a maritime environment.

The docks at both Liberty Square and Patriots Point are handicapped accessible. There is a working elevator on the ferries. Liberty Square also has a handicapped drop-off area adjacent to the Visitor Education Center.

In addition to the current tourism boom, the Charleston region has seen considerable population growth recently due to expanded port activity and the location of a Boeing manufacturing facility in North Charleston. As a result, Fort Sumter NM is contending with greater levels of congestion in its gateway communities.

Sullivan’s Island in particular is experiencing increasing numbers of day visitors, who are drawn by the beaches and the wealthy enclave’s seaside charm. During peak periods on weekends and holidays, Route 703, the primary route in and out of Sullivan’s Island, becomes heavily congested, with traffic backing up into Mount Pleasant. On the most congested days, such as July 4<sup>th</sup> and Memorial Day, it can take hours to get off the island. Unscheduled openings of the swivel bridge on Route 703 exacerbate these conditions.

Downtown Charleston experiences high levels of congestion, due in large part to its narrow streets and many competing modes, both motorized and non-motorized. Concord Street in front of

Liberty Square is used as a cut-through by motorists trying to avoid congestion on East Bay Street, which is located two blocks west of the square.

Long Point Road, which is the primary access route for Charles Pinckney NHS, experiences significant congestion during peak periods due to its use as a commuter cut-through between I-526 and US 17. Events at Boone Hall Plantation, located across Long Point Road from Charles Pinckney NHS, have major impacts on visitor experience at the park. Park staff will close Charles Pinckney NHS for safety and access reasons during certain such events. For the one or two largest events at Boone Hall Plantation, the NPS will bring in a law enforcement officer from Congaree NP to help with safety and traffic control.

The park also faces development pressures from the surrounding communities. The Town of Sullivan's Island has repeatedly expressed a desire to sell open space near Battery Jasper, which is adjacent to Fort Moultrie; however, the NPS has an easement on that parcel of land. In Mount Pleasant, the Patriots Point Development Authority would like to develop additional land at Patriots Point, but the land is deed restricted through an agreement with the Land and Water Conservation Fund.

Both Fort Sumter NM and Charles Pinckney NHS have improved visitor mobility through improved wayfinding signage, which includes new signage for Liberty Square in downtown Charleston and on I-26 entering Charleston, and for Charles Pinckney NHS on US 17 in Mount Pleasant.

## Multimodal Connections

Visitors seeking to access Liberty Square have several modes from which to choose, including private vehicle, tour bus, trolley, taxi, pedicab, public transit, water taxi, bicycling, and walking. Multiple Charleston Area Regional Transit Authority (CARTA) routes serve Liberty Square, including Trolley Route 210 and Bus Route 201. A CARTA trolley stop is located in front of Liberty Square on Concord Street. Patriots Point is served by CARTA Bus Route 41. While there is no direct transit link between Liberty Square and Patriots Point, it is possible to travel between the two locations on transit with a transfer in downtown Charleston. There is no transit access to Sullivan's Island or to Charles Pinckney NHS.

Liberty Square enjoys excellent pedestrian facilities, including sidewalk connections and a connection to a pedestrian path that travels along much of the Charleston peninsula. The vision of a pedestrian path around the entire Charleston peninsula has been one of Mayor Joseph Riley's primary transportation goals, and has largely been realized. The Arthur Ravenel Jr. Bridge, also known as the Cooper River Bridge, opened in 2005 and provides a high quality pedestrian and bicycle connection between the Charleston peninsula and Mount Pleasant. The bridge is a very popular destination for walkers, joggers, and bicyclists on weekday mornings and evenings and on weekends.



Clockwise from top left: Bicycle parking in the Aquarium Garage; pedicabs awaiting customers on Concord Street; people waiting at the CARTA trolley stop in front of Liberty Square; a taxicab offloads passengers at Liberty Square.

The opening of a College of Charleston academic building next to Liberty Square has increased pedestrian and bicycle activity and transit ridership in and near the square.

Water taxi service between Liberty Square and Patriots Point is available but unreliable, and park staff reported that it is not really a viable option for park visitors.

Park management is looking to more actively promote bicycle and pedestrian connections to various historic sites around Charleston, including Fort Sumter NM. There is a long-term plan for a multiuse trail connecting Mount Pleasant and Sullivan's Island along Route 703 as part of a broader vision for a ped/bike connection between the Charleston Battery to Sullivan's Island. Improvements were recently completed to an existing multiuse trail on the mainland side of the swivel bridge. Sullivan's Island also has been planning for a hiking trail and bike facilities on the island.

Private bike tours are popular on Sullivan's Island, and usually include Fort Moultrie on the tour.

## Resource Protection

### Historical and Cultural Assets

Fort Sumter NM preserves and interprets a variety of historical assets that are central to its mission and status as an historic monument. Numerous elements of Fort Sumter NM feature interpretation, including the historic fortifications at Fort Sumter, Fort Moultrie, various batteries around Sullivan's Island, the Visitor Center and Visitor Education Center, and Liberty Square's walkways. The historic Coast Guard property does not currently include interpretation; however, the park intends to restore several historic buildings on the property and offer interpretation of the site. The park does not anticipate providing public access to the lighthouse, which is still used by the Coast Guard.

The park continually seeks to strike a balance between providing safe and adequate access to these historical offerings while also ensuring that these assets are preserved and maintained for future enjoyment and appreciation.

Fort Sumter also serves as a stopover for migrating butterflies. The superintendent is undertaking efforts to make staff more aware and better informed on the park's natural resources as well as its historical resources. He also would like to add interpretation of natural resources on the return ferry trip from Fort Sumter, so that visitors would receive historical interpretation on the trip to the fort, and natural resource interpretation on the return.

### Negative Resource Impacts

Fort Sumter currently faces negative resource impacts due to wave action resulting from large container ships and tankers. Cargo ships and cruise ships also negatively impact the historic viewsheds and vistas in and around Charleston Harbor.



A container ship and a Coast Guard cutter navigate past one another in the shipping channel adjacent to Fort Sumter.

Wave action is already impacting the fort wall, and these impacts will accelerate with the anticipated arrival of supertankers following the expansion of the Panama Canal in 2015. These supertankers will create additional wave impacts on the fort, safety impacts within the shipping channel, and will further obstruct viewsheds and vistas. By 2030, there are anticipated to be twice as many tankers in the harbor, and they will be twice as large on average as the tankers today.

The City of Charleston also is seeking to build a new cruise ship terminal that would increase cruise ship traffic. This effort is currently tied up in court.

# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



## Great Smoky Mountains National Park

September 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at Great Smoky Mountains National Park in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the SER LRTP effort, SER staff have identified nine Focus Park units that are representative of the broad range of units in the region. The SER LRTP core project team will visit each of these Focus Parks over the course of several months at the start of the LRTP effort to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 park units within the Southeast Region, each focus park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

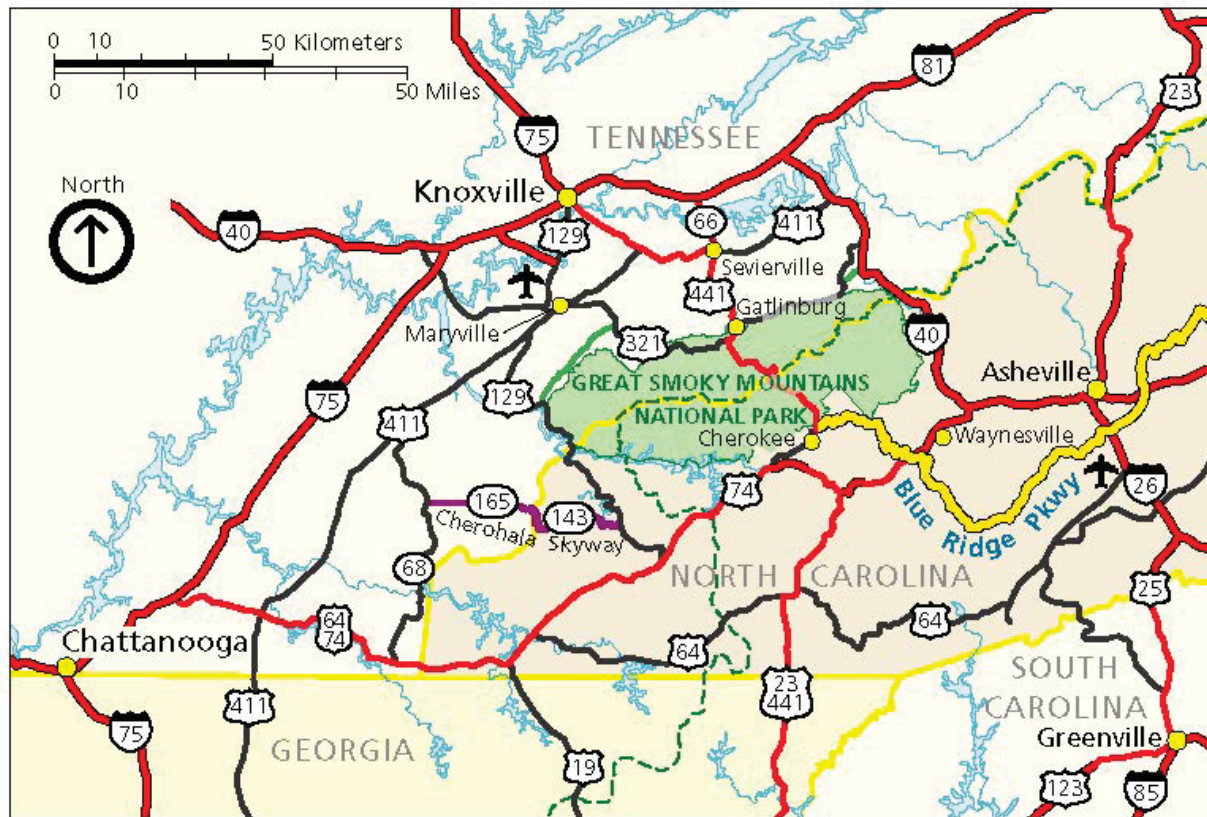
The third of the nine Focus Park visits took place at Great Smoky Mountains National Park (NP) on September 10-11, 2014. The visit included conversations with park staff as well as a park tour and field review to observe firsthand specific transportation assets and conditions. The site visit was attended by the following individuals:

- Clayton Jordan, Acting Superintendent / Chief Ranger, Great Smoky Mountains NP
- Alan Sumerski, Acting Deputy Superintendent, Great Smoky Mountains NP
- Imelda Wegwerth, Landscape Architect and FLTP Coordinator, Great Smoky Mountains NP
- Dianne Flaugh, Supervisory Landscape Architect, Great Smoky Mountains NP
- Kent Cave, Supervisory Park Ranger, Great Smoky Mountains NP
- Dana Soehn, Management Assistant / Public Affairs, Great Smoky Mountains NP
- Steve Kloster, Acting Chief Ranger, Great Smoky Mountains NP
- Charles Sellars, Deputy Chief of Facility Management, Great Smoky Mountains NP
- Herb Kupfer, Project Specialist, Denver Service Center
- Teresa Cantrell, National Park Service Southeast Region and Great Smoky Mountains NP
- Lewis Grimm, COR, FHWA Eastern Federal Lands
- Chris Jaeschke, ACOR, FHWA Eastern Federal Lands (via teleconference)
- Kevin Keeley, VHB
- Elissa Goughnour, VHB

## Park Overview

Great Smoky Mountains NP is located in the southern Appalachian Mountains in eastern Tennessee and western North Carolina. The park is approximately 40 miles from Knoxville, Tennessee, and 60 miles from Asheville, North Carolina (Figure 1). Its location places the park within 550 miles of one-third of the American population. Gateway communities include Gatlinburg and Townsend in Tennessee and the Cherokee Reservation on the North Carolina side.

Figure 1: Regional Context Map



Source: NPS and ESRI

The mission of the Great Smoky Mountains NP, established on June 15, 1934, by a Congressional mandate, is to “preserve the exceptionally diverse resources of the Great Smoky Mountains National Park and to provide for the enjoyment of these resources in such manner as will leave them unimpaired for the enjoyment of future generation.”<sup>1</sup> The park preserves and interprets a variety of historical and cultural features that support this mission, including 160 historic buildings and structures, over 800 miles of trails including a section of the Appalachian Trail with elevations ranging from 800 feet to 6,642 feet at Clingmans Dome. The park is also a designated International Biosphere Reserve and a World Heritage Site, both of which are UNESCO designations.<sup>2,3</sup>

<sup>1</sup> Great Smoky Mountains NP Strategic Plan, October 2008, p 3.

<sup>2</sup> United Nations Educational, Scientific and Cultural Organization Biosphere Reserves. Available: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/>.

<sup>3</sup> United Nations Educational, Scientific and Cultural Organization World Heritage List. Available: <http://whc.unesco.org/en/list/>.

The Great Smoky Mountains NP is nearly half a million acres in size, with approximately 250,000 acres each in Tennessee and North Carolina, and is the most visited park in the nation with 8-10 million visitors each year. By comparison, the park with the second highest visitation is the Grand Canyon with 4.4 million visits, the third highest is Yosemite with 3.8 million, followed by Yellowstone with 3.4 million visitors. In 2012, there were 9.6 million recreational visits to the park and over 11 million travelers on the Gatlinburg Spur. With the amount of visitors to the park, it serves as an economic hub generating over \$818 million in revenue in 2011 and supporting 11,732 jobs in gateway communities.

The following sections of the report provide further details on the park's transportation conditions, challenges, and needs based on the conversations with park staff and field observations gleaned during the Focus Park visit.

## Asset Management

### Transportation Assets

#### ROADS

There are 384 miles of roadway maintained by the park (238 miles paved and 146 unpaved), 5 tunnels, and 145 bridges; see Figure 3 for a park map. The most popular route in the park is Newfound Gap Road. This road bisects the park, connecting Gatlinburg to the Cherokee Indian Reservation and providing access to the park's highest peak, Clingmans Dome. Newfound Gap Road is currently designated as a state scenic byway and the park is pursuing a national scenic byway designation. One of the prerequisites to obtaining a national scenic byway designation is a corridor management study, which is currently underway with an anticipated completion date of the end of 2015.

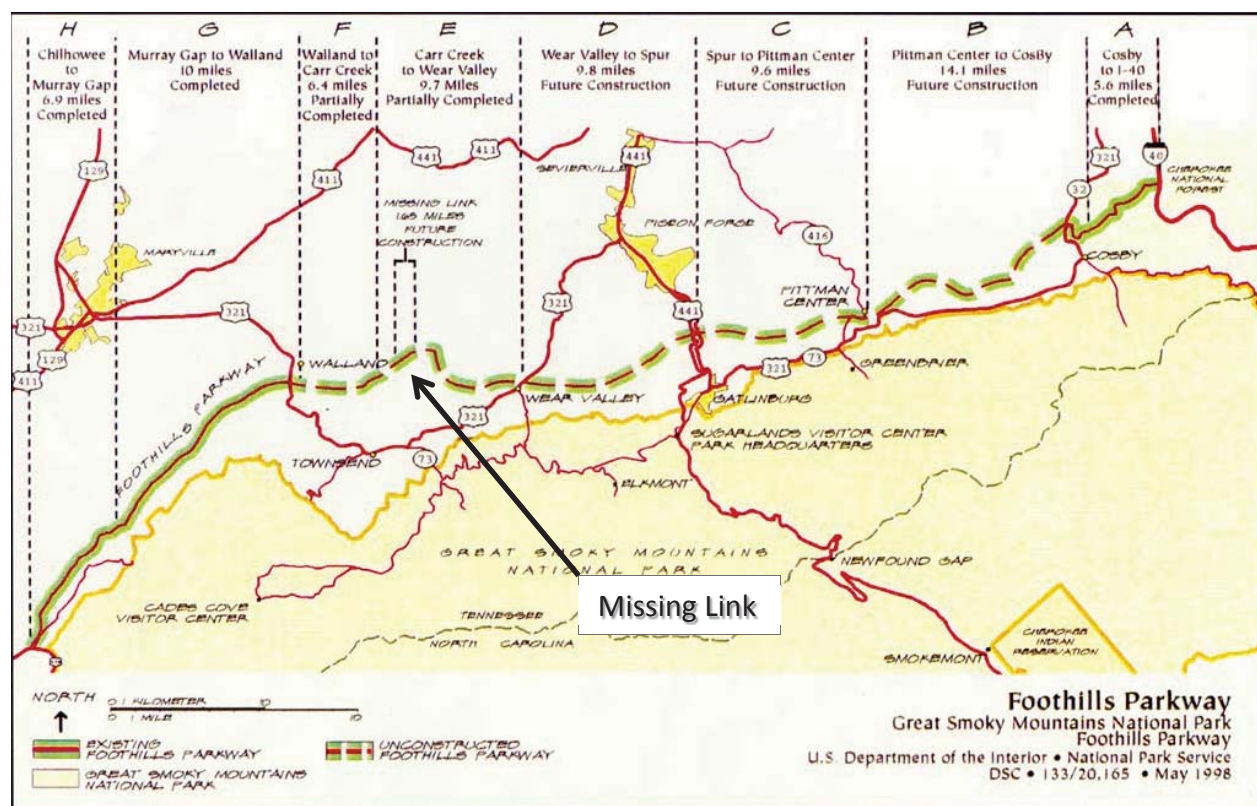
A series of paved roads travel east and west along the northern side of the park and include Little River Road and Laurel Creek Road, which lead to Cades Cove, an 11-mile one-way loop road and one of the park's most popular destinations.

The park also owns and maintains roads that are located outside of the main park property. One of those roads is the Spur. It is a spur of the future Foothill Parkway and is also US 441 that connects Pigeon Forge to Gatlinburg and the park. The Spur is a divided four-lane roadway and features a tunnel on the northbound side. The Spur is a popular commuter route, with roughly 90 percent of traffic in and out of Gatlinburg utilizing the Spur. Park recorded traffic counts of vehicles entering the park, including employee, non-recreation and recreation vehicles, indicate that most visitors access the park through the Gatlinburg Spur. The peak monthly traffic count southbound on the spur was 956,915 vehicles (June 1994) and 821,539 vehicles in the northbound direction (July 1997).<sup>4</sup>

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<sup>4</sup> National Park Service. Great Smoky Mountains Traffic Counts by Location Report (1994-2014). Available: <https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Traffic%20Counts?Park=GRSM>.

Figure 2: Map of Great Smoky Mountains National Park Foothills Parkway



Source: NPS GRSM Strategic ITS Plan, 2007

The Foothills Parkway is another roadway that is located outside of the main park. It was created to provide views of the park and was intended to run parallel to the northern park boundaries, extending from I-40 in the Cherokee National Forest in the east to Chilhowee on the western side of the park. Due to funding constraints the parkway does not extend this entire distance but currently exists as two separate roadways. Figure 2 illustrates the existing and unconstructed portions of the roadway. The state of Tennessee has purchased all of the right-of-way necessary to build the parkway but environmental issues and funding shortages have delayed the completion of the entire parkway. Although construction began in the 1960s, to date, there are only two constructed portions of the parkway. Foothills Parkway East, an almost 6-mile portion, connects I-40 to US 321 and provides visitors access to the park via 321. On the western side of the park, Sections H and G are completed and open to the public. A series of bridges known as the “missing link” are under construction and, when completed in 2017, will create a continuous 17-mile portion of the parkway extending from US 129 to US 321.



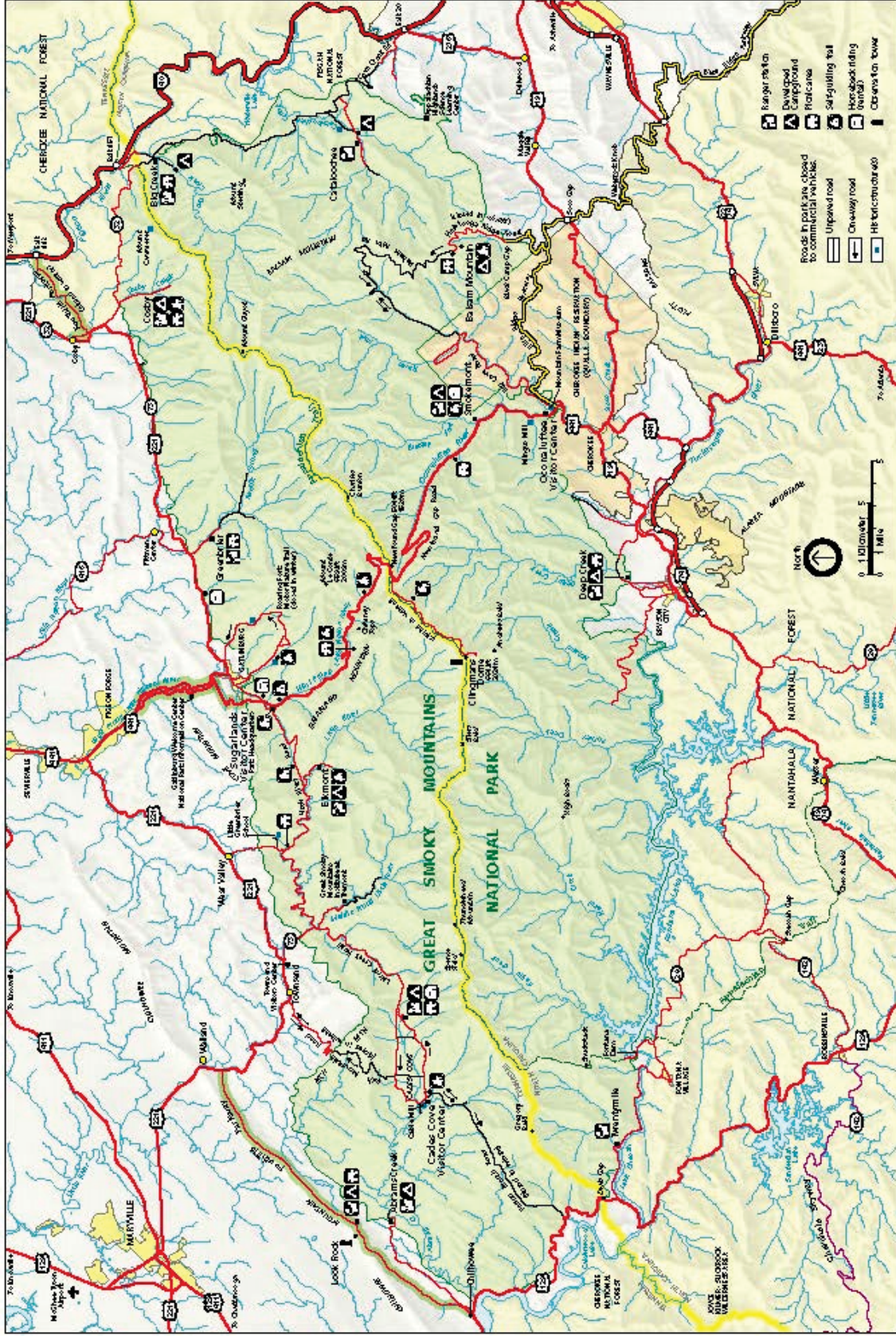
One of the bridges under construction on the Foothills Parkway.

Commuter routes that lie just outside the park's borders include I-40, which passes from the northwest, through Knoxville, Tennessee, and then along the eastern side of the park to Asheville, North Carolina.

Proposed and planned roadway improvements in the park include:

- The completion of the 17-mile portion of the Foothills Parkway already underway. Upon completion of this section, two sections of the parkway will be complete, comprising 23 miles of the originally planned 72-mile corridor.
- Continued rehabilitation of Newfound Gap Road. Work on the final remaining 6.5 miles is expected to begin in December 2014.
- Replacement of eight bridges on Roaring Fork Motor Nature Trail beginning in November 2014 with an expected completion date of April 2015.
- Continued monitoring for potential landslides.

Figure 3: Map of Great Smoky Mountains National Park



Source: NPS.

## **PARKING**

Various types of parking are available throughout the park, all free of charge. The parking lots or pull-offs with the highest utilization rates appear to be at trail heads, scenic vistas, and near attractions such as mills, waterfalls, and visitor centers. When parking is full, visitors will create their own parking spaces by parking on or alongside the road.

There are many requests to improve and expand parking areas, and “lack of parking” is the top complaint park staff receive from visitors. A common discussion among park staff is whether specific parking areas should be improved or removed completely. In some locations the park is constrained by wastewater treatment facility capacity and does not have the option to improve or expand parking. At these locations the treatment facility is currently at capacity and increasing parking near restroom facilities may increase usage. If the park chooses to close parking or restrict street-side parking they oftentimes place boulders, berms, or guardrail as a physical barrier. However, this seems to push the issue farther down the road and vehicles will park at the end of the boulders.

One location where parking was recently improved was at a location called “The Sinks” or Meigs Falls. This waterfall is located directly off of Little River Road and at the Meigs trailhead. This parking area was improved in 2010 from an informal area with space to accommodate approximately 5 vehicles to a 25-space lot and trailhead. The decision to improve the space was due in part to serious resource impacts resulting from unregulated parking and due in part to its use as a local hangout used for illicit activities.



Parking improvements at “The Sinks.”

## **PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES**

Within the park’s boundaries are more than 800 miles of backcountry trails, with 70 miles of the Appalachian Trail, and approximately 400,000 hikers annually. Most of the trails are unpaved. Laurel Falls is one of the few paved trails and has heavy visitation.

About 550 miles of the hiking trails are open for equestrian use. Off-trail or cross-country horseback riding is prohibited. There are five drive-in horse camps that provide access to park backcountry horse trails at the following locations: Anthony Creek, near Townsend, TN; Big Creek, near Newport, TN; Cataloochee, NC; and Round Bottom and Tow String, both located near Cherokee, NC. Guided horseback rides are available at four concession horseback riding stables: Cades Cove, near Townsend, TN; Smokemont, near Cherokee, NC; Smoky Mountain, near Gatlinburg, TN; and Sugarlands, near Gatlinburg, TN.

Bicycling is allowed on most of the roads throughout the park although it is not encouraged in many locations due to the terrain and narrow roadways. There are no mountain biking trails in Great Smoky Mountains National Park; however, the Gatlinburg Trail and the Oconaluftee River Trail are both open to bicycles. Bicycles are prohibited on all other park trails.

Cades Cove Loop Road is the most popular bicycling destination in the park and bicycles may be rented at the Cades Cove Campground Store. On Wednesday and Saturday mornings, from early May through the end of September, Cades Cove Loop Road is closed to motorized vehicles before 10 AM. Park staff estimate that there can be over 700 bikes and 150 to 200 pedestrians using the loop during this period. During these closures, motorized vehicles arrive at the entrance to Cades Cove and block the roads or park in undesirable locations, such as maintenance areas and alongside the road, until Cades Cove reopens to motorized vehicles.

There are equestrian facilities in the park. Riders may bring their own horse to the park or participate in a guided horseback ride from any of the four concession horseback riding stables in the park. Off-trail or cross-country riding is prohibited although there are approximately 500 miles of hiking trails and 90 designated campsites open for equestrian use. In addition, there are five drive-in horse camps that provide access to backcountry horse trails.

Many park visitors—particularly those conducting “windshield tours”—are interested in short hikes, and park staff report that many nature trails and back country trails are underutilized.

### **ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)**

The park does not operate shuttle services although there are numerous private tour buses, trolleys, and other transit services that are provided in the surrounding areas and provide connections to the park. The Gatlinburg Trolley has a “National Park” route that travels from the Gatlinburg Mass Transit Center into Great Smoky Mountains National Park with stops at the Sugarlands Visitor Center, Laurel Falls Parking Area, and Elkmont Campground. The Fun Time Trolley offers service in the Pigeon Forge and Sevierville areas and provides a connection to the park through the Gatlinburg Trolley system.



Numerous private tour buses provide services in the park.

### **Funding and Partnerships**

The park has numerous relationships with partner organizations. This portion of the report identifies some of those relationships that affect the transportation system.

## **ROADS**

According to the Park, roads in many ways have defined the character of the park and have been at the center of many controversies. The park is one of the few national parks that does not charge an entrance fee, which affects park funding and the ability of the park to address the demands of maintaining and operating a park with increasing visitation. The states of Tennessee, North Carolina, and local communities paid for the initial construction of the route which became Newfound Gap Road. When transferring ownership of the road to the park, the state of Tennessee stipulated that "no toll or license fee shall ever be imposed ..." If the park wished to charge for admission, the Tennessee legislature would be required to lift this deed restriction.

The park has a number of Memorandums of Understanding and Agreements in place with other jurisdictions and communities; some of those are for neighboring communities to provide assistance to the park and others outline services the park will provide. One agreement that requires the park to provide additional services involves access to culturally significant lands. Lakeview Drive is a road that is located on the northern side of Fontana Lake and extends almost 6 miles west of the park border near Bryson City. There were plans for the road to be extended to Fontana Dam, however, in light of environmental concerns the road was never completed. Agreements were put in place with families that used to live in that area that the park would give them access to those lands, which include burial sites. In many cases providing access involves the use of boats and all-terrain vehicles as there are no roads on the northern side of the lake.

Other agreements have allowed the park to share the cost and burden of maintaining some roadways within its boundary. Park rangers enlist the use of LifeStar helicopter services (operated by UT Medical Center) to use for emergency response. The park does not have ambulances and primarily relies on the cities of Gatlinburg, Pigeon Forge and Cherokee police and fire departments, and other local jurisdictions for ambulance service.

Over the past several years the park has experienced several major landslides and relied on assistance from partners such as the U.S. Army Corps of Engineers (USACE), Eastern Federal Lands Highway Division (EFLHD), state Departments of Transportation, and The Eastern Band of Cherokee to provide an incentive for completing the construction ahead of schedule.

The park reports quarterly to advisory groups appointed by North Carolina and Tennessee governors. These advisory groups have strongly supported funding for the Foothills Parkway. The park also has a non-voting seat on the Sevier County Transportation Board, and park staff have a future goal of increased involvement at the Knoxville Metropolitan Planning Organization (MPO).

Other partner organizations include the Friends of the Smokies. A major source of funding for the park, this organization commits approximately one million dollars each year to fund various park needs such as a rainy day fund and property purchases. This organization helped to fund exhibits at the Oconaluftee Visitors Center. The Great Smoky Mountains Association is another valuable partnership. This membership organization primarily provides education and staff, serves as an extension of interpretive programs offered by the park, provides the park with grant writing assistance, and has helped fund building projects such as the new Oconaluftee Visitor Center.

## **PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES**

Great Smoky Mountains NP performs routine maintenance on its trails but also benefits from outside funding sources for special projects. Trails Forever is an endowment that is funding the current trail restoration project at Chimney Tops. The Trails Forever crew consists of experienced and highly skilled trail workman supervised by the park's trail supervisor. Chimney Tops restoration is scheduled to be completed in 2015. The next project slated for the Trails Forever crew will be the restoration of the Alum Cave Trail.

## Sustainable Operations

### Environmental Sustainability

The park's commitment to environmental sustainability is evident by its designation as a Climate Friendly Park in 2011. Some of the green initiatives include a vehicle fleet that includes nine hybrid and two electric vehicles. The park was awarded a DOE/Clean Cities grant to purchase three neighborhood electric sized vehicles to replace three gasoline vehicles, convert five mowers to propane, and install two DC Fast Charge and two Level Two re-charging stations in the park.

The park uses B20 diesel fuel to fuel maintenance vehicles and heat the park headquarters. Great Smoky Mountains NP will be the first park in the NPS system to have DC fast charging stations, which will be located at the Oconaluftee and Sugarlands Visitor Centers. The Park was recently awarded a second year DOE/Clean Cities grant to install propane fueling stations which would allow for a more comprehensive conversion to propane vehicles.

Additionally, the park strongly considered environmental sustainability when designing the Oconaluftee Visitor Center. The facility, which was constructed and donated by the Great Smoky Mountains Association, is LEED certified and was designed with a host of environmentally sensitive features such as geothermal heat pumps, recycled post-industrial rubber roof shingles, use of natural ventilation, interior light sun sensors, remotely monitored heating and air conditioning systems, and a rainwater harvesting system. To reduce fossil fuel consumption associated with shipping materials, twenty percent of the building materials were manufactured and harvested within a 500-mile radius of the facility.<sup>5</sup>



The LEED-certified Oconaluftee Visitor Center.

During winter operations the park has considered using deicing materials versus sanding the roads. Park staff noted some of the trade-offs include the environmental impacts of the deicing materials, the emissions from plows idling during sanding operations, and the amount of sand that travels to the streams as runoff.

In recent years, the park staff have become concerned with noise pollution created by motorcycles. A light and noise specialist will be investigating these concerns and will be stationed at the park as a term position from the region.

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<sup>5</sup> National Park Service. Oconaluftee Visitor Center is a “Green” Building. Available: <http://www.nps.gov/grsm/playourvisit/ovc-green-building.htm>.

## Financial Sustainability

### FUNDING

A consistent theme voiced by park and regional staff during the Focus Park visit was chronic underfunding of transportation needs in the park. Great Smoky Mountains NP has the highest visitation of all parks but is the only park in the top four that does not charge an entrance fee. Grand Canyon, Yosemite, and Yellowstone NP all charge between \$20 to \$25 for each single, private, non-commercial vehicle and all its passengers.

Some of those items that have been affected by gaps in available funding, or have had a significant impact on park finances include:

- ❶ Completing planning studies. The park has postponed the completion of certain planning studies, such as in Cades Cove, or have conducted the studies in phases due to sporadic funding.
- ❷ The ability of the park to responding to storm and environmental events such as downed trees damaged by non-native tree-killing insects/diseases and landslides.
- ❸ Completing the unconstructed portions of the Foothills Parkway.

Partner organizations greatly aid the park in funding for asset management and programs within the park. While there are numerous organizations that provide assistance, two of the organizations that provide the most in terms of funding are the Friends of the Smokies and the Great Smoky Mountains Association. The Friends of the Smokies was founded in 1993 and raised four million dollars for an endowment. The organization commits approximately one million dollars per year to the park. The Great Smoky Mountains Association provides more in-kind contributions in the way of education and staffing; however, they also fund items that are then given to the park. These organizations also work together for the benefit of the park. One example of this scenario is the construction of the Oconaluftee Visitors Center. The Great Smoky Mountains Association constructed the facility at a cost of \$3 million, with \$550,000 provided by the Friends of the Great Smoky Mountains for visitor orientation and museum exhibits. Upon completion, the center was donated to the park. Proceeds from sales of items in the shop go to the Great Smoky Mountains Association, which staffs the shop; profits in turn allow the Association to fund the park.

### STAFFING

Staffing is currently a major challenge for the park. Due to a variety of circumstances, the park has experienced turnover in management staff forcing the remaining staff to assume temporary positions, sometimes in addition to their regular responsibilities. One example of this is the park's superintendent position, which has been vacant for over nine months and has been filled temporarily with several park staff members. In December 2014, SERO announced the new Superintendent for Great Smoky Mountains NP, Cassius Cash. The Deputy Superintendent position has been vacant since early 2014.

As expressed by other parks, in order to meet the needs of their growing visitation and park use, staff feel that they are continually pressed to "do more with less." The park has 240 permanent staff, including 21-22 law enforcement rangers on the Tennessee side and 12-13 rangers on the North Carolina side, and about 80 seasonal staff. As mentioned previously, the park relies heavily on over 2,600 volunteers that fill many gaps in staffing and funding needs.

According to the site visit attendees, the impacts of the staffing shortage can be felt in many areas, including:

- **Condition of transportation assets.** The park has neither the funding nor staffing to fully maintain trails, and relies on volunteers to handle the gap in trail maintenance.
- **Enforcement.** The park has the ability to respond to emergencies and keeping the road clear but typically does not have the staffing to enforce other park laws such as poaching and resource protection.
- **Safety.** The park has difficulty continually maintaining picnic areas. Visitors use the picnic areas throughout the day, breakfast is particularly popular among families. Park staff have to make sure that food is not left behind and that trash receptacles are emptied to prevent conflicts between visitors and wildlife, particularly bears.

## Safety

### Motorized Vehicle Conflicts

Park staff report that the greatest number of motor vehicle crashes occur on the Spur, and that they devote substantial resources to responding to incidents on this roadway. Motorcycle traffic on Foothills Parkway is also a concern; the parkway features sweeping vistas and numerous horizontal curves and elevation changes that attract large numbers of motorcyclists, and that make for challenging driving conditions for even the most experience riders.

Motor vehicle conflicts can also be found on Little River Road at the entrance to the Sugarlands Visitor Center parking lot, particularly during the afternoon peak when large numbers of vehicles are leaving the park and vehicles turning out of the visitor center lot can have difficulty finding gaps to turn left onto Little River Road.

For several, years the park obtained NHTSA funding to cope an aggressive DUI enforcement program with NHTSA funding; however, the program is not funded at this time.

### Intermodal Conflicts

Intermodal conflicts are not a major concern throughout the park as many visitors choose to take more of a “windshield tour;” however, there are some intermodal conflicts or concerns at specific locations. The primary location for intermodal conflicts is at Cades Cove and in particular the Cades Cove parking area. The 11-mile loop is congested with vehicles bumper to bumper, but is also popular among bicyclists and pedestrians.

### Parking

Park staff have noted that parking at trailheads and other popular visitor destinations are safety concerns. Some of the safety issues are related to mixing of pedestrians, bicyclists, and motorized vehicles. Parking on the road is a safety concern as it narrows the roadway, and can block traffic. Law enforcement officials noted that it has been difficult for first responders to pass through these areas. Park staff have tried to eliminate the ability of motorists to park in certain areas through placement of physical barriers, such as boulders. Staff have noted that in many cases, however, these barriers usually push the parking down the road. Sometimes this results in more pedestrians walking along the road to their desired destination.



Parking in Cades Cove. These lots are typically full leading drivers to park on or alongside the road.

## Data Gaps

At Great Smoky Mountain NP, park rangers report crashes using the Incident Management, Analysis, and Reporting System (IMARS) software. Usually the full report is not entered into the software as rangers have limited time to devote to record management and the lack of complete electronic records leads to gaps in the park's data. The primary obstacle to improving transportation safety within the park is the lack of available manpower to proactively analyze, identify, and address safety concerns. Park staff typically only have the ability to respond to urgent issues rather than proactively addressing safety.

## User Experience, Mobility, and Access

### Visitation

The Great Smoky Mountains NP is the most visited park in the nation with 8-10 million visitors each year followed by the Grand Canyon NP with 4.4 million visitors, Yosemite NP with 3.8 million, and Yellowstone NP with 3.4 million visitors. 2012 there were 9.6 million recreational visits to the park. The effects of increased visitation are magnified at certain locations within the park. There were over 11 million travelers on the Gatlinburg-Pigeon Forge Spur in 2012, and from 1976 to 1997 there was a 300 percent increase in visitation at Cades Cove.

Park visitation is not as concentrated during certain parts of the year as it may be at other parks. The park historically experienced higher visitation in the summer and fall months; however, as the gateway communities have fostered year-round visitation to the region through events such as the Festival of Lights that extends from November 1 into March, and six to eight weeks of spring break activities, the park now has visitor peaks throughout the year. The year-round visitation can complicate routine maintenance schedules and road clearing and closing operations during the winter months.

Most of the park's visitors choose to take what staff refer to as a "windshield tour" of the park and experience the park by driving through it; however, some visitors use the park for camping, hiking, horseback riding, and educational opportunities. The park charges fees of \$14-\$23 for activities such as overnight camping and pavilion rental at picnic areas. Some activities and facilities charge more and require reservations.

Park staff noted that there are a wide variety of visitors to the park, which may change seasonally, and they have differing needs and concerns. Many families that visit the park during the summer months and over holidays. Older adults are more prevalent during the school year and college students over spring break. Also, during the winter months, the park has more visitors from the South who are hoping to experience snow.

### Mobility and Visitor Experience

Transportation is a critical component in visitor experience in the park, especially since many of the visitors experience the park by driving through it. Congestion is a major concern on the Tennessee side of the park. Congestion affects visitor experience in many locations throughout the park. On the Spur between the park and Pigeon Forge it can be difficult for visitors and employees to leave the park. Issues on the spur are exacerbated during events like Rod Runs in Pigeon Forge. In Cades Cove travel times on the 11-mile loop can be up to 4 hours. This congestion affects visitor experience and is also a safety concern as emergency personnel have difficulty responding to incidents.



Congestion on Cades Cove Loop Road. (Source: NPS)

Other factors that impact mobility and the visitor experience are availability and location of parking and wildlife viewing opportunities. At trailheads, vistas, and visitor attractions such as the mills, parking is a concern. When parking is full visitors will park on or alongside the road. Sometimes parked vehicles contribute to the congestion issues by blocking or reducing travel lane widths. There is considerable demand by visitors for more parking and the lack of parking is the number one complaint among visitors to the park; however, the park is hesitant to improve or increase parking out of caution for resource protection and capacity limitations of wastewater treatment facilities.

Wildlife viewing opportunities can be unpredictable and may lead to traffic jams. For the well-being of wildlife, it may not be desirable to foster parking and stopping in locations frequented by wildlife. When parking is not provided, however, visitors will create their own or will stop on the road and block traffic. In the Great Smoky Mountains NP, bear, deer, and elk jams are common. Elk jams are a relatively new issue as the herd was reintroduced the park in the past several years and is thriving and growing.

The park has several one-way roads and the operation of these roads impacts visitor experience. The limitations on traffic flow and popularity of these destinations results in increased congestion. The narrow roadway width forces the park to close them for maintenance, weather, and emergency response related issues.

Most primary roads are open year round but may be closed due to inclement weather. Newfound Gap Road is a primary route that can be closed for portions of the day during winter months. Some roads, such as Clingmans Dome Road, Parson Branch Road, and Little Greenbrier Road, among others, are closed during the winter months. The specific closure dates vary for each roadway.

With increasing park visitation and traffic, particularly in Cades Cove, the park has explored alternative options to improve traffic flow such as transit, ITS, reservations, pullouts, parking, wayfinding and signage. The 1982 General Management Plan recommended that visitor service information should be used to encourage visitors to visit less. However, as visitation has continued to increase, the park has taken steps to mitigate traffic and convey messages to visitors using variable message signing and the Great Smoky Mountains NP website.

## **Multimodal Connections**

The Gatlinburg Trolley provides shuttle service between Gatlinburg and multiple locations within the park. Additional connections are available to Pigeon Forge and Sevierville via a transfer to Fun Time Trolley system. Aside from the transit connections, the most prominent multimodal connections are the roadways leading in and out of the park and the Appalachian Trail. There do not seem to be many demands placed upon the park by neighboring communities to create additional multi-use connections on the main park property.

There have been efforts to use the unconstructed portions of the Foothills Parkway as a multi-use trail rather than developing it into a roadway. These efforts have been unsuccessful and the plan remains to construct portions of the roadway as funding becomes available.

## **Mode of Access**

Despite congestion in the park, most of the visitors to Great Smoky Mountains continue arrive by private vehicle and tour bus. It is possible to use transit to access the park but that does not appear to be a well-used option.

## Resource Protection

### Historical and Cultural Assets

The park's founding statement reflects a mission to preserve Southern Appalachian mountain culture.; however, there are many buildings, landscapes and artifacts from before and after that period. There are many discussions between park staff about what items and aspects of structures and landscapes to maintain.

Cultural resources include hundreds of historic structures and both prehistoric and historic archeological sites, some of which are located within four historic districts listed on the National Register of Historic Places. Eleven structures are individually listed on the National Register of Historic Places although many more are considered by the park to be eligible. There are a variety of ethnographic resources within the park including cemeteries and the park holds an extensive cultural and natural museum collection and archival collection. There are also 42 cultural landscapes. A cultural landscape is defined by the National Park Service as, “a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.”<sup>6</sup> Several road corridors within the park are considered to be cultural landscapes.

The park continually seeks to strike a balance between providing safe and adequate access to these historical and cultural offerings while also ensuring that these assets are preserved and maintained for future enjoyment and appreciation. Issues include a lack of documentation with only a fraction of the park systematically surveyed for archeological resources and many historic structures and most cultural landscapes not fully documented. Also most of the museum collections and archives are stored by the park in a facility that does not meet all standards for the storage of museum collections. A new curatorial multi-park facility in Townsend is being planned and will address this storage issue.



The grist mill in Cades Cove is one of the two mills operated by the park. Both mills are open daily mid-March through October, and on weekends in November.

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<sup>6</sup> National Park Service. Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes. Available: <http://www.nps.gov/tps/how-to-preserve/briefs/36-cultural-landscapes.htm>.

## Natural Resource Assets

Great Smoky Mountains National Park is unique in its combination of biological diversity and cultural and historic resources. The Great Smoky Mountains are also recognized internationally as an International Biosphere Reserve and World Heritage Site. The park's natural resources include a tremendous variety of tree species, forest types, and flowering plants, as well as over 60 mammals. Large sections of the Park are inaccessible by road and managed as Wilderness.

The variety of natural resources in the park is exceptional, with 1570 species of flowering plants, 135 species of trees, 2,000–20,000 species of fungi, 400 species of moss and 800-plus species of Lichens. The park has a healthy population of between 1,500 and 1,800 bears. It is a popular place for bird enthusiasts with over 200 species of birds, and is also home to 8,000 species of insects. The park has 30 species of salamanders and is known as the Salamander Capitol of the World.

Preservation is a continuing concern in the areas of the Park that are heavily used. Major trails along the Roaring Fork, Newfound Gap and Little River Roads, for example, receive very heavy usage while trails in more remote areas of the Park may be underutilized. Another concern includes resource damage resulting from overflow parking in unmarked areas. Because the Park is emphasizing preservation of natural and historic/cultural resources, it is highly unlikely that additional capacity will be provided on existing Park roads.

The park's major environmental concern, however, is air quality. The park's geographic location in relation to major power plants and industrial facilities, combined with prevailing weather patterns and the "trapping" effect of its mountain peaks, provides a striking example of how air pollution from remote sources can impact a National Park. Average summer visibility, for example, has been reduced from 65 to 70 miles to only 12 miles.

Documented impacts on water, soil quality and vegetation have been identified as well, with high ozone levels and acidic rainfall two of the most significant problems. The Park is working with environmental agencies in Tennessee and North Carolina to influence the conditions under which state air quality permits are granted.

## Negative Resource Impacts

Preserving historical, cultural, and natural resources while maintaining access for the roughly 8-10 million annual visitors is a challenge Great Smoky Mountains NP. A common sentiment in many parks is that visitors are "loving the park to death;" however, the concern is slightly different in the Great Smoky Mountains. As the growth in communities surrounding the park has increased, it is a common sentiment that the park has shifted from being the primary draw for visitors to the region to becoming one of the many attractions. In combination to visiting the park, Pigeon Forge, Dollywood, Gatlinburg, and the Cherokee Indian Reservation all draw large crowds. The staff expressed concern that this shift in priorities has had a negative impact on park resources.

Also, as the park does not charge an entrance fee, many people pass through the park simply because it offers a direct route from Gatlinburg to Cherokee. The park has noted that this dynamic fosters a lack of appreciation for the natural and cultural resources and poses a resource protection issue for the park. The park has issues with poaching of plants and animals and the defacing of historical structures.

Some of the primary transportation concerns noted by park staff include air quality impacts on park flora, fauna, soil, and water; impact of visitor use on backcountry trails and facilities; and impact of overcrowding on park roadways on visitor enjoyment.

Park staff noted that climate change and the increasing frequency of severe weather events have had negative impacts on both natural resources and the transportation system. Some of these, such as storms that down trees, occur randomly but are increasing in frequency. The park has experienced significant loss of chestnut, Fraser fir, and hemlock trees stands from non-native tree-killing insects and diseases and does not have enough staff to address the affected trees. As a result, these trees are more susceptible to damage during storm events. The downed trees can block roads and trails and the park has a difficult time with emergency response.

Landslides have also been a particular concern for the park. Recently there have been several landslides or evidence of possible landslides that pose a safety concern to drivers. These events are expensive and time consuming to mitigate and impassable roads greatly inhibit the park's ability to respond to emergencies.



The park experiences negative impacts from the number of visitors and how some of those visitors treat park property. On the left, visitors are walking around the wall and path, which have been damaged with red paint, to get a different view of The Sinks waterfalls. The center photo shows the desired path created by visitors park that walk directly from a parking area to one of the park's historical buildings rather than using the designated trail. On the right, creative signage located in Cades Cove with messaging aimed at mitigating negative visitor impacts.

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# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



## Gulf Islands National Seashore

October 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at Gulf Islands National Seashore in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the Long Range Transportation Plan effort, Southeast Region staff identified nine Focus Parks representative of the broad range of units in the region. The SER LRTP core project team visited each of these Focus Parks over the course of several months at the start of the LRTP effort to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 parks within the Southeast Region, each Focus Park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

The eighth of the nine Focus Park visits took place at Gulf Islands National Seashore (NS) October 8, 2014 (Mississippi District) and October 9, 2014 (Florida District). The visit included conversations with park staff as well as a park tour and field review to observe specific transportation assets and conditions. The site visit was attended by the following individuals:

- Steve McCoy, Deputy Superintendent, Gulf Islands National Seashore
- Teresa Cantrell, National Park Service Southeast Region
- Chris Conklin, VHB
- Kristin Malakorn, VHB

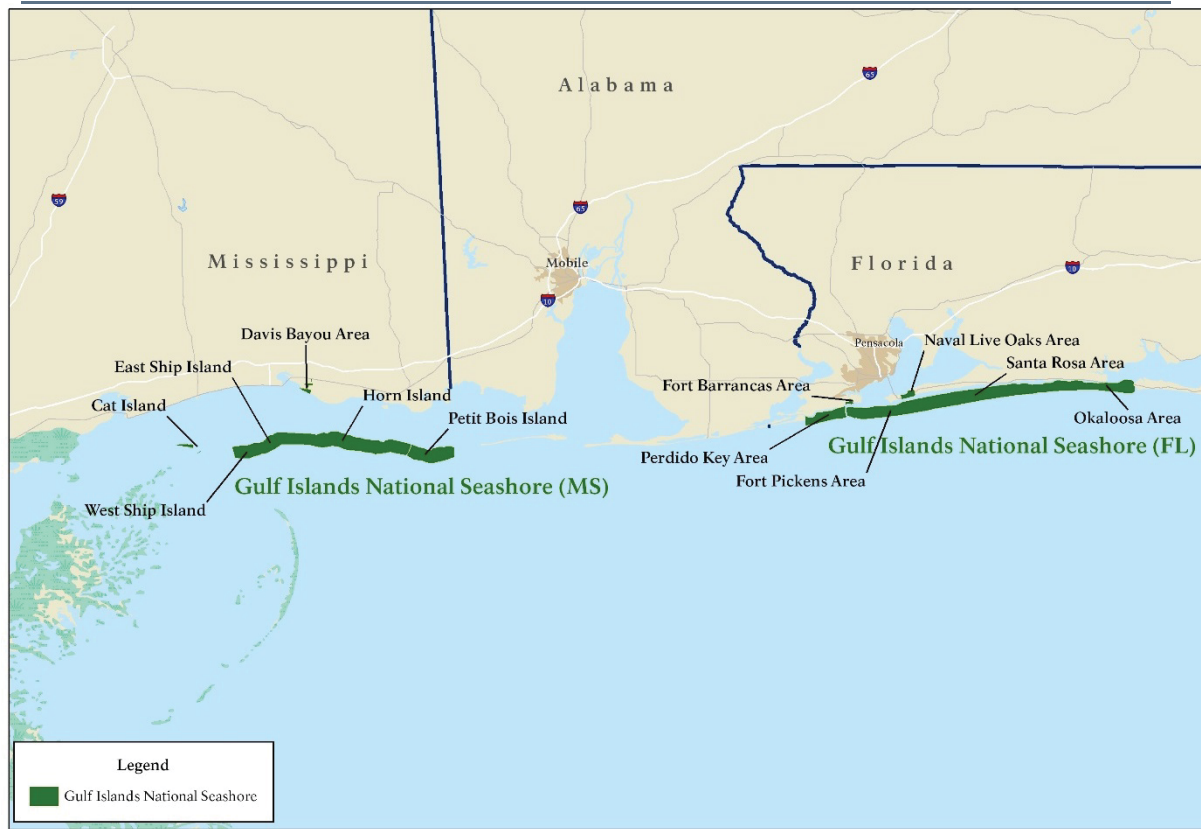
Additionally, Kevin Buckle and Louis Skrmetta of Ship Island Excursions provided information about their concession, which is currently providing ferry and landside services to visitors traveling to West Ship Island. Rhonda Harper, NPS GUIS Law Enforcement Ranger, provided some information about enforcement challenges in the Mississippi District.

### Park Overview

Gulf Islands National Seashore stretches across approximately 160 miles of the gulf coast from Gulfport, Mississippi to Fort Walton Beach, Florida. The park is divided into two districts (Mississippi and Florida). The National Seashore had the fourth highest visitation in the Southeast Region in 2013 with 4,837,965 visitors. A majority of the park is made up of several barrier islands along the coast, some as far as 12 miles from shore. National Park Service jurisdiction includes submerged lands within one mile of the barrier islands in each direction.

The Focus Park visit included site visits to half a dozen of the land units within the National Seashore. These six units provide an understanding of the greatest transportation challenges and needs within the entire National Seashore. Following is a discussion of all the land units within the National Seashore. The units are listed below with a brief description of characteristics, visitor experiences, and recreational opportunities that are available in that unit.

Figure 1: Regional Context Map



Source: NPS and ESRI

## MISSISSIPPI DISTRICT

- West Ship Island:** West Ship Island is a barrier island located approximately 12 miles off the Gulf Coast south of Gulfport, Mississippi and Biloxi, Mississippi. This island is only accessible by boat; vehicles are not permitted on the island. The island is open to private boaters, however, the majority of visitors ride the Ship Island Excursions ferry to the island. Approximately 60,000 visitors ride this ferry each year. Once on the island, visitors can experience both historic and natural resources including historic Fort Massachusetts, beach combing, birdwatching, swimming, and fishing. Landside concessions are also available that provide equipment rental and food. Visitors cannot remain on West Ship Island overnight.
- East Ship Island:** East Ship Island is located east of West Ship Island and accessible only by private boat. The two barrier islands were once connected, however, that connection has largely washed away. The Mississippi Coastal Improvements Program will rejoin East and West Ship Islands; the barrier island restoration will begin in 2015 and take about three years. East Ship Island was not a focus of this park visit.
- Cat Island:** Cat Island is a barrier island located west of West Ship Island and accessible only by private boat. The National Park Service owns 41 percent of the island, the State of Mississippi owns or will soon own 54 percent, and the remainder is privately owned. This island was not a focus of this park visit.

- **Horn Island and Petit Bois Island:** These barrier islands are located east of East Ship Island and west of the Alabama border. These islands are accessible only by private boats. These islands were not a focus of this park visit.
- **Davis Bayou Area:** The Davis Bayou Area is located on the mainland in Ocean Springs, Mississippi, in a primarily residential area. This unit was a state park and campground before being transferred to the National Park Service. This unit is a resource to the community offering fishing, hiking, biking, birdwatching, picnicking, camping, and ranger programs. Additionally, visitors can experience unique bayou and Mississippi upland hardwood ecosystems. The majority of visitors to this unit are from the local community. The Davis Bayou Area is the Mississippi District facilities headquarters.

## FLORIDA DISTRICT

- **Fort Pickens Area:** The Fort Pickens Area occupies the eastern 7.5 miles of Santa Rosa Island east of Pensacola Beach, Florida. Much like West Ship Island, the Fort Pickens Area offers both historic and natural resources for visitors to experience. The Fort Pickens Area includes an extensive collection of coastal fortifications, ranging from the nineteenth-century Fort Pickens to coastal batteries active in WWI and WWII. From a natural resources perspective, visitors can enjoy white sand beaches, the Gulf Coast viewshed, swimming, cycling, snorkeling, fishing, hiking, and camping. Visitation to this area was approximately 1,255,000 visitors in 2013.<sup>1</sup>



View of Battery Cooper from Battery Worth.

- **Perdido Key Area:** Perdido Key is located just west of Santa Rosa Island and Fort Pickens. Johnson Beach Road runs through the western miles of the area; however, the eastern five miles are not accessible by automobiles. Vehicles park along Johnson Beach Road to experience the waterfront including Johnson Beach. Visitors to this area can swim, boat, fish, hike, and camp.
- **Santa Rosa Area:** The Santa Rosa Area is an approximately seven mile long segment of Santa Rosa Island located west of Navarre Beach. Highway 399 runs the entire length of the area providing automobile and bicycle mobility. In this area, visitors can experience Opal Beach, shelling, swimming, fishing, bird watching, and photography.
- **Naval Live Oaks Area:** The Naval Live Oaks Area is located east of Gulf Breeze. It is a nature preserve that provides hiking trails, picnic areas, and youth campground facilities for ranger programs and outreach. Naval Live Oaks is the headquarters for the Gulf Islands

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<sup>1</sup> "GUIS Visitation by Locations and by State" December 2013 Report. URL: [https://irma.nps.gov/Stats/SSRSReports/Park Specific Reports/Park YTD Version](https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Park%20YTD%20Version)

National Seashore.

- ❶ **Okaloosa Area:** The Okaloosa Area is the easternmost land area in the National Seashore. It is located on the eastern tip of Santa Rosa Island. Similar to the Perdido Key Area and the Santa Rosa Area, visitors here can experience the natural resources of the National Seashore while swimming, boating, and picnicking. This area was not a focus of this park visit.
- ❷ **Fort Barrancas Area:** The Fort Barrancas Area is located within Naval Air Station Pensacola, east of the Museum of Naval Aviation. This area is dedicated to protecting the historic fortifications of Fort Barrancas and the Advanced Redoubt. This area was not a focus of this park visit.

The mission of this park is to “... preserve certain outstanding natural, cultural, and recreational resources along the northern Gulf Coast of Florida and Mississippi. These include several coastal defense forts spanning more than two centuries of military activity, archeological values, pristine examples of intact Mississippi coastal barrier islands, salt marshes, bayous and submerged sea grass beds, complex terrestrial communities, emerald green water, and white sand beaches.” Additionally, “The purpose of Gulf Islands National Seashore is to preserve and interpret its Gulf Coast barrier island and bayou ecosystem and its system of coastal defense fortifications, while providing for the public use and enjoyment of these resources.”

The park mission and purpose provide some perspective on the breadth and diversity of resources and demands contained within this one park. Each unit uses its unique resources to support the park mission and struggles with unique challenges. This park is challenged with protecting historic and natural resources, providing recreational opportunities to the regional and local community, and coordinating with other stakeholders as a community resource that is physically integrated into host communities.

The following sections of the report provide further details on the park’s transportation conditions, challenges, and needs by goals area based on the conversations with park staff and field observations gleaned during the Focus Park visit. Specific park units are called out to provide background and context where appropriate.

## Asset Management

### Transportation Assets

#### ROADS, PARKING, AND BRIDGES

Seven units at Gulf Islands National Seashore have road, parking, or bridge assets. Table 1 summarizes assets by unit.

**Table 1 Gulf Islands National Seashore Roadway, Parking, and Bridge Inventory**

Unit	Roads (miles)	Parking (sq ft)	Bridges
Davis Bayou (MS)	5.0	243,800	3
Fort Barrancas (FL)	0	7,560	0
Fort Pickens (FL)	11.5	266,700	0
Naval Live Oaks (FL)	1.0	138,300	0
Okaloosa Area (FL)	0.5	130,400	0
Perdido Key (FL)	2.5	162,000	0
Santa Rosa (FL)	7.5	265,900	0
<b>Total</b>	<b>28.0</b>	<b>1,214,600</b>	<b>3</b>

Source: SER Transportation Asset Inventory, Facility Management Software System. DRAFT 2014.

Roads are generally in good condition throughout the park units. At the Davis Bayou Area, visitor mobility by automobile, bicycle, and walking is provided by the roadway network. Both the Fort Pickens Area, the Santa Rosa Area have a two-lane roadway that runs the length of the area providing automobile and bicycle access. The Perdido Key Area has approximately two miles of roadway and the remaining three miles is roadless.

An asset management challenge that the Fort Pickens, Santa Rosa, and Perdido Key areas share is the impact of sand burying the roadway. A typical rain or wind event can cause sand dunes bordering these roadways to encroach upon the roadway, limiting access and potentially causing a safety hazard. With regular maintenance, this issue can be managed. More extreme weather events can result in the roadways being completely buried by sand and extensive efforts are required to reopen the roads.

Parking is typically in fair condition at most units. At the majority of units, the parking supply exceeds parking demand. The exceptions are at Fort Pickens Area and Perdido Key Area. The parking at Fort Pickens Area beach locations is often at capacity during the summer recreation season. At Perdido Key Area, parking is allowed along some sections of Johnson Beach Road, which is about 22 feet wide. During peak season this road can become very congested. The road shoulders frequently become filled with migrating sand, requiring vehicles to park on the actual road surface on both sides of the road. This limits the available driving surface to one vehicle width down the center of the road.



Parking lot in the Fort Pickens Area

Bridges in Davis Bayou Area are in good condition. These bridges are an important resource to the

local community as they provide access to the park and the local community over Pabst Road and the railroad tracks and over Government Street.

### **BICYCLE AND PEDESTRIAN FACILITIES**

There are bicycle lanes running along Highway 399 in the Santa Rosa Area, and along the first four miles of Fort Pickens Road in the Fort Pickens Area. There is also a multi-use trail paralleling Highway 98 through Naval Live Oaks. The park is currently doing an Environmental Assessment to add bicycle/pedestrian accommodations to Park Road in the Davis Bayou Area.

On West Ship Island, Santa Rosa Area, and Fort Pickens Area boardwalks provide necessary pedestrian connectivity in challenging topographies. Additionally, hiking trails can be found at most units.



Boardwalk at West Ship Island leads visitors to Fort Massachusetts, concessions, and the shore.

### **TRANSIT SERVICE**

At this time the only transit service in the park is the concession ferry service that brings visitors from Gulfport, Mississippi to West Ship Island. Without this service, West Ship Island would only be accessible by private boats, similar to East Ship Island, Horn Island, and Petit Bois Island. Ship Island Excursions is the concession that operates ferry service to West Ship Island, as well as the landside amenities on the island. There are one to two daily departures from the mainland during the spring and fall, and two to three daily during the summer. During the peak season, Ship Island Excursions uses three vessels to move as many as 1,200 visitors per day.

Planned transit service at Fort Pickens Area is one of the major transportation projects taking place in the Southeast Region at this time. A ferry service similar to the operation at West Ship Island is in the planning and implementation process at this time. The service will connect Pensacola, Pensacola Beach, and Fort Pickens via ferry. Additionally, a landside shuttle service will be provided for visitor access to the various sites located throughout the Fort Pickens Area. A number of partner organizations have been involved in this project, which is critical to planning and implementation.

## Funding

### ROADS, PARKING, AND BRIDGES

Roadway, parking, and bridge general maintenance on critical routes is sufficiently funded through the cyclic maintenance funds and, ultimately, is also supported by the Emergency Relief for Federally-Owned (ERFO) Roads program. Climate change has had a notable impact on this region of the country including the National Seashore. Gulf Islands NS does not plan to rely on ERFO funding, however, the increasing frequency of extreme weather events and the impact that those events have on the transportation network have made ERFO funding necessary at times to provide a safe and effective transportation network for visitors and employees.

### BICYCLE AND PEDESTRIAN FACILITIES

In order to make bicycle facility maintenance more efficient, bicycle facilities are incorporated into the roadway network. At the Santa Rosa Area specifically the bicycle path that was located several feet north of the roadway was removed and incorporated into Highway 399 as bike lanes in each direction. This reduces maintenance to one facility, not two.

Boardwalks make up many of the pedestrian facilities at this park. Similar to roadways, the cyclic maintenance that is done to maintain these facilities is sufficient to keep these assets in good condition.

### ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

Another fund source that has been critical to funding and decision-making in recent years has been British Petroleum (BP) Deep Water Horizon Natural Resource Damage Assessment (NRDA) funding. BP has set aside money to fund projects that will restore environmental damage and lost visitor use in the Gulf Coast that resulted from the Deep Water Horizon oil spill in 2010. These funds are available through an application process. Gulf Islands NS has been able to utilize these funds in support of mega projects, such as the planned Pensacola-Fort Pickens ferry service, that otherwise could not be funded by the park or the region.



## Sustainable Operations

### Climate Change

The impacts of climate change and extreme weather events on Gulf Islands National Seashore is a priority concern for decision makers at the park. Barrier islands, by their nature, are dynamic land masses that are subject to environmental factors and weather. Additionally, extreme weather events can have sudden and substantial effects. One example is Ship Island which was split into West Ship Island and East Ship Island by Hurricane Camille. In 2005, Hurricane Katrina created waves that washed over the top of Fort Massachusetts on West Ship Island and toppled over parts of the fort.

As the frequency and severity of extreme weather events increases, climate change, adaptation, vulnerability, and resiliency are being incorporated into transportation decision-making. The planned Fort Pickens ferry service was largely motivated by climate change and extreme weather events. Fort Pickens Road, the primary public access to the Fort Pickens Area, was closed from 2004 to 2009 due to storm damage, and the roadway has been temporarily closed due to storm events many times since. The financial costs associated with continuing to provide vehicle access to the Fort Pickens will reach a point where it is not sustainable. This has led the park to begin planning for future access to the park unit without use of Fort Pickens Road.

Fort Pickens Road is an important asset to the local community. In the interim period, considerations have been made to attempt to adapt Fort Pickens Road to extreme weather events. To date, about half of Fort Pickens Road has been realigned to better fit in the natural topography of the island to a location where existing sand dunes will provide some protection against weather damage. Additional segments of the roadway are planned for realignment in the near future.



*Boardwalk buried by sand at Perdido Key.*

## Environmental Sustainability

Throughout the park, utilizing solar energy where feasible is desirable to help offset the carbon footprint of the park and to take advantage of a resource that is plentiful on the Gulf Coast. The park is installing solar panels on all newly constructed facilities. Current projects include restrooms facilities in the Fort Pickens and Davis Bayou campgrounds and in the Davis Bayou picnic area.

With the planning and implementation of the Fort Pickens ferry and shuttle services, a number of environmental considerations have been made. The planned Fort Pickens landside shuttle service will be provided by solar powered electric shuttles. Furthermore, a series of solar panels will be installed in the proposed shuttle maintenance and storage area to recharge the shuttle batteries.

On West Ship Island, the concession Ship Island Excursions has taken the initiative to reduce energy use by utilizing solar panels to power its utility vehicle. This type of initiative is desirable from a logistics standpoint.

## Financial Sustainability

### PARTNERSHIPS

As mentioned, funding for basic maintenance is reasonably well funded through the cyclic maintenance program. As major storm and weather events have taken place over the last decade, Emergency Relief for Federally-Owned (ERFO) Roads program has been critical to rehabilitating damaged assets. These funds must be applied for and awarded to the park when the need arises, and are not relied upon, however, they have had a positive impact on the park's ability to maintain the roadway and pedestrian network in good condition.

In the Santa Rosa Area, Gulf Islands NS has a unique relationship with state and federal transportation. Highway 399, which runs the length of this area, is a state evacuation route. If there were an emergency on Santa Rosa Island or an incident involving either of Highway 399 bridges in Pensacola Beach or Navarre Beach, this stretch of Highway 399 through Santa Rosa Area could be critical to the community for safe passage. For this reason, the National Seashore works with the Florida Department of Transportation and the Federal Highway Administration to ensure the road is properly maintained for safe and efficient travel along this route.

Funding for large scale projects that are unrealistic in today's constrained transportation budgets have been funded with assistance from BP Deep Water Horizon restoration monies.

### STAFFING

Staffing issues was a common them at each unit that was visited. Decreasing budgets over the years make it difficult to fill positions vacated by transfer or retirement. Delays in funding and filling positions has led to staffing shortages in some units.

The park is heavily reliant on volunteer support for staffing. The park also continually seeks opportunities to make better use of existing staffing. One example is that the park has replaced trash cans with dumpsters in key locations and has initiated a "pack it in and pack it out" program. This increases the availability of staff for other tasks. Another example is that the park has entered into a cooperative agreement with the Santa Rosa Island Authority to provide lifeguard services at Langdon Beach in the Fort Pickens Area.

According to the site visit attendees, the impacts of the staffing constraints are felt park-wide:

- **Enforcement.** Law enforcement officers have observed that local visitors are often aware of the lack of enforcement presence and tend to obey laws only when monitored. The Mississippi District barrier islands specifically attract large groups in an area that is challenging to enforce due to lack of staff.
- **Safety.** Safety concerns vary from unit to unit. In the Mississippi District, large groups of boats rafting together at the barrier islands is a safety concern. Up to 15 boats typically will raft together or anchor near one another. Lack of staff limits law enforcement here.
- **Natural and cultural resources.** The park does not have sufficient cultural resources staff to fully care for and interpret the various historic military resources. This is particularly evident in the Fort Pickens Area. Natural resources are threatened on the Mississippi District barrier islands by excessive volumes of private boaters docking by the island. Horn Island alone receives about 500 private boats on a typical peak day during the peak season. In the Florida District, natural resources on the barrier islands are impacted by on-street parking and vehicle traffic. Shorebirds nest near roadways and high vehicle speeds are the primary contributor to road kills which total as many as 150 annually.

## Data Gaps

Data gaps were not cited as a significant hurdle to transportation decision-making or improvements. Data collection was improved in 2014 when traffic volumes count stations are installed at nine locations covering six units of the National Seashore. With regular maintenance these count stations have been sufficient.

## Safety

Gulf Islands National Seashore considers safety in all decision-making. Typically, safety issues do not exist in isolation but are directly or indirectly related to other issues, and so, they are addressed throughout this document. However, two critical safety issues were noted during the Focus Park visit — Enforcement/Jurisdiction and Intermodal Conflicts.

### Enforcement and Jurisdiction

Law enforcement staffing constraints have implications throughout the park. In the case of the Mississippi District barrier islands law enforcement ranger vacancies left only two officers to patrol the five barrier islands stretching along the entire Mississippi coast. Fortunately, these positions have now been funded and are in the process of being filled. In the Perdido Key and Fort Pickens areas, Night Owl passes have been issued to visitors interested in fishing in park units prior to sunrise or after sunset. Observationally, rangers have noted these passes can be abused and visitors may remain in park units after dark when no one is on staff. As part of the ongoing nationwide entrance fee rate structure changes, the Seashore is considering replacing the after-hours fishing pass with expanded operating hours to reduce nighttime law enforcement issues.

The most notable jurisdiction issue involves the waters, which comprise the majority of the area within the park's boundaries. Jurisdiction of the National Seashore generally extends one mile off the coast of the islands in each direction. This broadens the safety concerns well beyond visitor mobility on the islands or their shores. Gulf Islands NS does have partner support on enforcement from the U.S. Coast Guard, the Florida Department of Marine Management, Mississippi Department of Marine Resources, Florida Department of Environmental Protection, and Florida Fish & Wildlife Conservation Commission through memoranda of understanding. In many respects these partner agencies have a greater presence on park waters than NPS rangers.

### Intermodal Conflicts

#### DAVIS BAYOU AREA

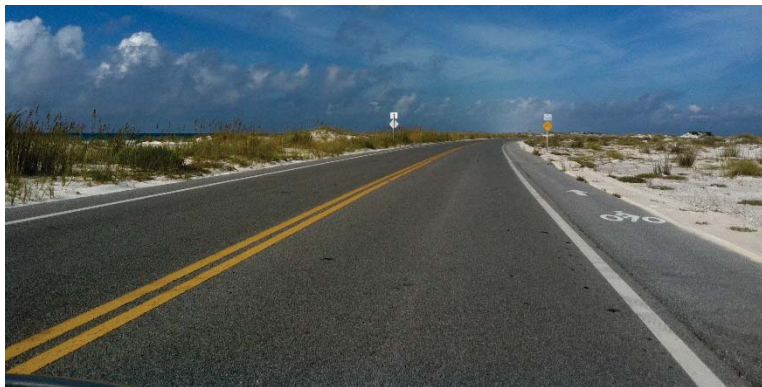
Intermodal conflicts have not been cited as a specific issue at most units. Davis Bayou Area, however, is one exception. At Davis Bayou Area vehicles, pedestrians, and cyclists share a network of roads about 22 feet wide for recreation and commuter travel. Davis Bayou Area is a former state park that is integrated into the local community with residences, schools and employers abutting the property. Park Road is the main entrance to the park unit and one of the few roads that provide access from Highway 90 to the south over railroad tracks via the Pabst Road Bridge. This connection attracts cut-through traffic that is presenting a danger to park visitors. Vehicle traffic is typically traveling faster than the posted speed limit. Dangerous speeds are further complicated by poor sight distance at many locations and narrow pavement width that does not provide a shoulder that could be used by pedestrians and cyclists. An Environmental Assessment of alternatives to address the issues is underway.



Left: Share the Road warning sign and a narrow roadway with no shoulder.  
Right: Congested Area warning sign and speed limit sign.

### **SANTA ROSA AREA AND PERDIDO KEY AREA**

Other intermodal conflicts at Gulf Islands NS are evident in the Santa Rosa Area and Perdido Key Area where, similarly, a narrow roadway is used to accommodate multiple modes of travel and, in the case of Perdido Key Area, on-street parking. Sand along the roadway often blows into the roadway narrowing the lanes even further. Slower travel speeds in Perdido Key Area and appropriate maintenance in the Santa Rosa Area keep these conflicts manageable.



Bicycle lanes on Highway 399 in the Santa Rosa Area are often covered with sand, limiting use.

## User Experience, Mobility, and Access

### Visitation

Gulf Islands NS welcomed almost five million recreation visitors in 2013, making it the fourth most visited park unit in the southeast region. Table 2 shows visitation by unit based on estimates from the NPS Office of Public Use Statistics.

**Table 2 Visitation Summary**

Florida Units	Visitation	Mississippi Units	Visitation
Fort Pickens	1,255,183	Davis Bayou	884,827
Santa Rosa	2,149,906	West Ship Island	44,418
Perdido Key	264,434	Private Boats	17,279
Naval Live Oaks	90,736	Other (MS)	880
Okaloosa Area	134,991		
Fort Barrancas	37,345		
Other (FL)	9,872		
<b>Total Florida</b>	<b>3,942,467</b>	<b>Total Mississippi</b>	<b>947,404</b>

Recreation visitation has been fairly steady over the last several decades, except for the period of 2005-2009 when the park was recovering from the impacts of Hurricane Ivan (2004), Hurricane Dennis (2005) and Hurricane Katrina (2005). Most notably, Highway 399 through the Santa Rosa Area and Fort Pickens Road, the only automobile access to the Fort Pickens Area, were closed for many years due to storm damage.

### Access and Mobility

Access and mobility were not cited as a significant challenge for Gulf Islands National Seashore. Some of the issues discussed are listed below.

- ❶ Davis Bayou Area does not have sufficient multimodal accommodations.
- ❷ Florida District units do not have sufficient wayfinding signage on area roadways.
- ❸ Visitors are not always aware of the Florida National Scenic Trail connections in the Fort Pickens Area.
- ❹ Entrance station congestion is an issue at the Fort Pickens Area in particular. This unit is a fee unit where visitors will stop at the entrance station to show a pass or pay a fee prior to entering. Oftentimes, visitors will also have questions about the park which can increase transaction times and create queuing and congestion. Gulf Islands NS is planning to add another lane and second entrance station.



Left: Florida National Scenic Trail (FNST) guide sign. Center: Historic signage for FNST. Right: Florida National Scenic Trail signage.

## Visitor Experience

A wide variety of visitor experiences are possible at Gulf Islands National Seashore, reflective of the variety of historic, cultural, and natural resources that the park can offer. Historic forts and batteries, multiple ecosystems and habitats, and various recreational activities can attract a range of visitors who may have differing expectations, travel needs, and stay for different lengths of time. Therefore, many transportation needs are unique to each park unit.

West Ship Island tends to attract visitors from throughout the region (within about 90 miles). Most visitors are from Mississippi and points west because there are other similar barrier island vacation options towards the east. Visitors to West Ship Island are generally middle to lower middle class families staying in the area one to two nights. Ship Island Excursions has continued to try to support these visitors by keeping prices manageable and amenities appropriate. Over half the visitors to this unit are repeat visitors. Most visitors (likely near 95%) travel to the island via the ferry, versus by private boats. Visitation to West Ship Island is driven in large part by the marketing and promotions done by Ship Island Excursions. It is estimated that the concession marketing and promotions accounts for about 80 percent of the total visitation.



Umbrellas and chairs for rent on West Ship Island.

Davis Bayou Area, Okaloosa Area, and Naval Live Oaks Area attract local visitors who are looking for a recreational facility where they can spend an afternoon with family. Naval Live Oaks Area also has many resources to engage youth in environmental education with programs and campgrounds to support youth programs.

Fort Barrancas Area attracts visitors who want to experience the historic sites included in this area. Public interest in the Blue Angels at Pensacola Naval Station likely supports this visitation. Visitors may be drawn from outside of the local community, but visits will likely only require a few hours or an afternoon.

Local visitors looking for opportunities to enjoy the seashore without large volumes of tourists will often use beaches on the Mississippi barrier islands, Santa Rosa Area, and Perdido Key. These visitors are likely familiar with travel in the area and visits will only stay for an afternoon.

Finally, Fort Pickens Area receives a mix of local and regional visitation. Local visitors use the beaches and campgrounds in the same way as the Santa Rosa Area or Perdido Key Area, to avoid large volumes of tourists. However, the historic batteries and Fort Pickens attract different types of visitors from the region. Visitors to the campgrounds may stay overnight in the park unit.

## Resource Protection

Resource protection is a critical element of the National Park Service mission. Resource protection and the critical resources of the National Seashore have been referenced throughout this document. This sections seeks to summarize some of the major historic, cultural, and natural resources that can be found at the National Seashore.

## Historical and Cultural Assets

The historic and cultural assets in Gulf Islands National Seashore focus on military history, specifically this country's history of coastal fortification. Major installations include:

- Fort Pickens and 10 coastal artillery batteries – [Fort Pickens Area](#)
- Fort Barrancas and Advanced Redoubt – [Fort Barrancas Area](#)
- Battery ruins – [Perdido Key Area](#)
- Fort Massachusetts – [West Ship Island](#)

The four forts are open to visitors and tours are provided. At this time, the interiors of the coastal artillery batteries in the [Fort Pickens Area](#) are not open to the public, but the exteriors of most are accessible. The planned Fort Pickens Ferry and Landside Shuttle Service may provide an opportunity to revitalize Battery Langdon for use as a shuttle storage and charging space. Working with regional cultural resources staff, the space will be restored to resemble its original appearance.

## Natural Resources

The natural resource assets in Gulf Islands National Seashore span a variety of ecosystems and habitats.

Barrier islands provide a home to Gulf Coast wildlife such as shore birds, sea grasses, turtles, and shellfish. Uncommon birds, animals, and marine life have habitats on these islands. These types of natural resources can be found at [Fort Pickens Area](#), [Okaloosa Area](#), [Santa Rosa Area](#), [Perdido Key Area](#), [Naval Live Oaks Area](#), [Petit Bois Island](#), [Horn Island](#), [East Ship Island](#), [West Ship Island](#), and [Cat Island](#). [Horn Island](#) and [Petit Bois Island](#) specifically are each federally designated wilderness areas.

Finally, [Davis Bayou Area](#) is a unique unit at Gulf Islands National Seashore. Natural resources and ecosystems in this unit are typical of the Mississippi Bayou including Coastal Mississippi upland hardwoods.



Left: Fort Pickens. Right: Disappearing gun at Battery Cooper



Left: Inside Fort Massachusetts. Right: Boardwalk at Perdido Key Area approaching the northern coast.



Left: Sting Ray at West Ship Island. Right: Great Blue Heron in the Fort Pickens Area.

## Negative Resource Impacts

This report has touched on a number of negative resources impacts taking place in Gulf Islands National Seashore. The following list summarizes many of the central themes discussed during this Focus Park visit.

- Barrier islands are dynamic by nature and always changing. Increasing numbers of extreme weather events (hurricanes) have resulted in extensive damage to historic, cultural, and natural resources. Extreme weather events also impact transportation infrastructure and in some areas have the potential to permanently alter transportation access.
- Barrier islands such as West Ship Island, East Ship Island, Horn Island, and Petit Bois Island are impacted by marine debris washing ashore from ships, boats, and off-shore drill rigs, as well as by visitor trash. Furthermore, on Horn Island and Petit Bois Island large numbers of visitors arriving on private boats (500 boats daily during peak season) docking and rafting on the island are causing damage to the natural resources in these designated wilderness areas.
- The sands along roadways on the barrier islands are nesting locations for many shorebirds. Vehicle traffic has resulted in as many as 150 road kills annually of these shorebirds.
- On-street parking in Perdido Key Area can have a negative impact on wildlife and vegetation that is unable to thrive under this stress. Vegetation is critical on the barrier islands as it can create stability in the island sand. This is critical during any weather event.

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# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



## Kennesaw Mountain National Battlefield Park

September 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at Kennesaw Mountain National Battlefield Park in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the SER LRTP effort, SER staff have identified nine Focus Park units that are representative of the broad range of units in the region. As part of the initial data collection phase of the project, the SER LRTP core project team will visit each of these Focus Parks over the course of several months to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 park units within the Southeast Region, each focus park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

The first of the nine Focus Park visits took place at Kennesaw Mountain National Battlefield Park (NBP) on July 8, 2014. The visit included conversations with park staff as well as a park tour and field review to observe firsthand specific transportation assets and conditions. The site visit was attended by the following individuals:

- Nancy Walther, Superintendent, Kennesaw Mountain NBP
- Anthony Winegar, Chief Ranger, Kennesaw Mountain NBP
- Kent Cochran, National Park Service Southeast Region
- Teresa Cantrell, National Park Service Southeast Region
- Makayah Royal, National Park Service National Capital Region
- Lewis Grimm, FHWA Eastern Federal Lands
- Teresa Parker, FHWA Eastern Federal Lands
- Chris Jaeschke, FHWA Eastern Federal Lands (via teleconference)
- Chris Conklin, VHB
- Nat Grier, VHB
- Kevin Keeley, VHB



cannons, memorials, historic structures, and historic transportation corridors. Access to these historical and cultural offerings is provided through paved roadways, an extensive trail system, and a visitor shuttle.

While the park's primary focus is on historical and cultural preservation and interpretation, it also serves as a popular recreational destination for local and regional residents. As the largest contiguous public green space in metropolitan Atlanta, the park experiences significant demand from recreational users. This demand has grown significantly over the past three decades, reflecting the tremendous growth in the county and the metropolitan area over that time period.

Due to its location in an increasingly urbanized area, Kennesaw Mountain NBP also experiences significant levels of non-recreational visitation. The park is bisected and bounded by multiple state highways that serve as major commuter corridors and are heavily congested during weekday peak hours. This congestion results in adverse impacts to access and mobility and visitor experience in and around the park.

The following sections of the report provide further details on the park's transportation conditions, challenges, and needs based on the conversations with park staff and field observations gleaned during the Focus Park visit.

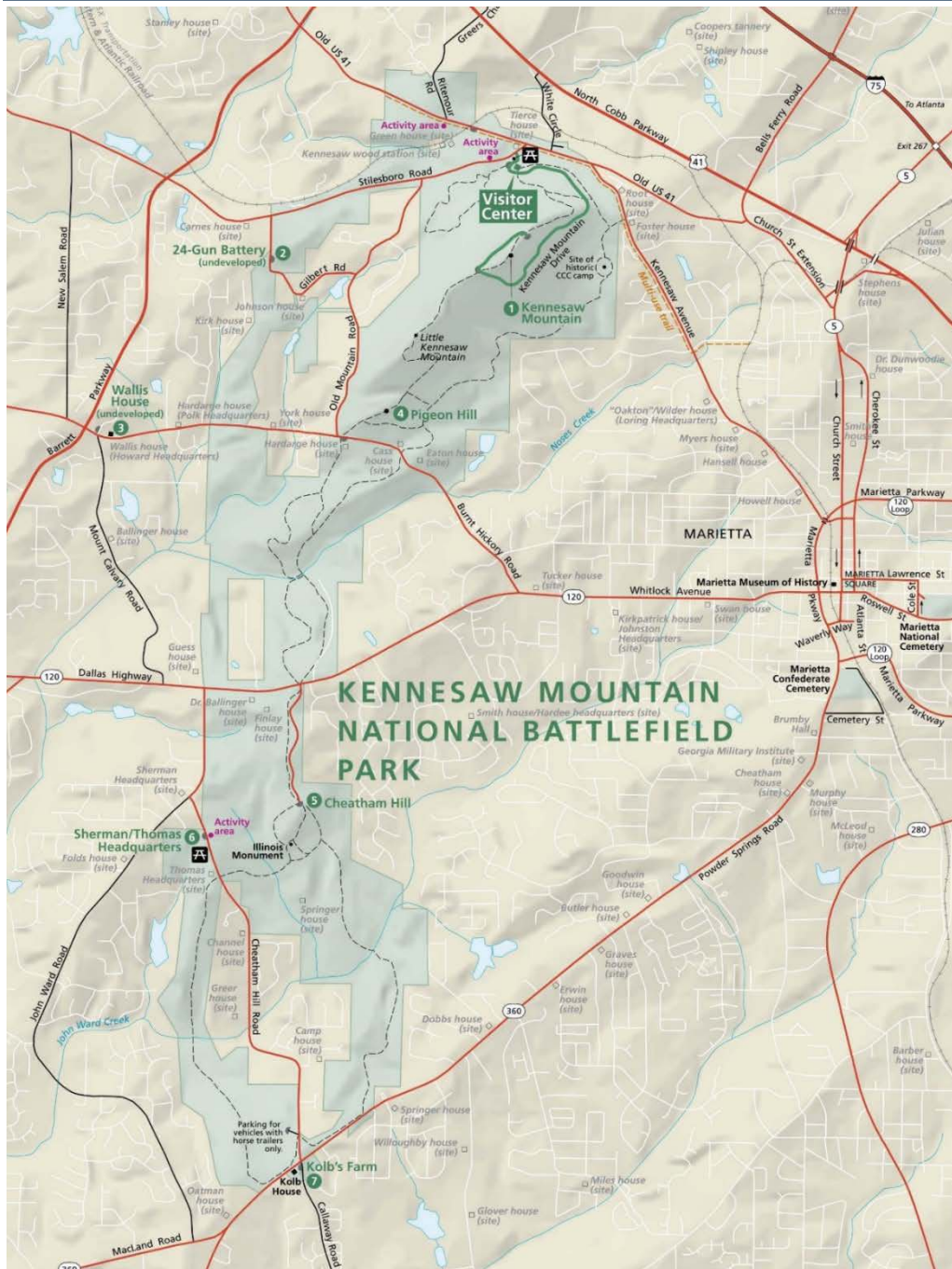
## Asset Management

### Transportation Assets

#### ROADS

There are 9 miles of roadway located within the Kennesaw Mountain NBP boundary, with nearly all of that roadway length owned by the National Park Service. See Figure 2 for a park map.

Figure 2: Map of Kennesaw Mountain NBP



Source: NPS.

Kennesaw Mountain Drive is a 1.5-mile, two-lane road that provides access to the Kennesaw Mountain NBP Visitor Center and to the peak of Kennesaw Mountain. The road, which is located entirely within the park boundary, is used by a variety of user groups—motorists, cyclists, pedestrians, and shuttle riders—to access both historical interpretation and recreational offerings on the mountain. The road is closed to private vehicles and bicyclists on weekends. This road is maintained by the NPS.

A number of east-west roadways that pass through the park serve as commuter routes and account for a majority of non-recreational visitors:

- ❶ Old US 41 and Stilesboro Road are two-lane roads that run through the northern end of the park and provide access to US 41 to the northeast (and I-75 beyond) and Barrett Parkway to the west. These roads see heavy peak hour use by motorists commuting to downtown Atlanta and to employment centers in the northern suburbs. In 2013, Old US 41 had an annual average daily traffic (AADT) of 15,610 vehicles per day (vpd) and Stilesboro Road had an AADT of 11,140 vpd in the vicinity of the Visitor Center.<sup>2</sup>
- ❷ Dallas Highway/Whitlock Avenue (GA 120) runs through the park's midsection and provides connections to Barrett Parkway and western Cobb County to the west and the City of Marietta and I-75 to the east. The road is two lanes within the park, but widens to four lanes just west of the park boundary. In 2013, Dallas Highway had an AADT of 24,990 vpd within the park boundary.
- ❸ Powder Springs Road (GA 360) runs along the southern edge of the park, and provides connectivity between southwest Cobb County and the City of Marietta. In 2013, Powder Springs Road had an AADT of 31,870 vpd in the vicinity of the intersection at Cheatham Hill Road.

Other major commuter routes that lie just outside the park's borders include North Cobb Parkway (US 41), which passes just north of the park and carries 33,950 vpd in the vicinity of the park; and Barrett Parkway NW, which serves as a major north-south connector in the county and carries 45,250 vpd.

Burnt Hickory Road is a two-lane east-west roadway that provides access to historical interpretation and recreational opportunities in the midsection of the park, including extensive hiking trails and interpretive trails at Pigeon Hill.

Proposed and planned roadway improvements in the park include:

- ❶ A major widening project already underway at the intersection of Powder Springs Road and Cheatham Hill Road at the southern end of the park. When completed, there will be 20 lanes (according to the final drawings) at the intersection.
- ❷ A proposed roundabout at the intersection of Cheatham Hill Road and John Ward Road, just outside the western boundary of the park.
- ❸ Proposed widening of Whitlock Avenue (GA 120) from two lanes to four lanes east of the park.

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<sup>2</sup> Traffic volumes were retrieved from the GDOT Traffic Counts website.

## **PARKING**

Kennesaw Mountain NBP has eight parking lots of varying size and levels of utilization. All parking lots in the park are free of charge.

Recent parking lot improvements include the expansion and improvement of the Burnt Hickory Road lot from a gravel lot with a 25-vehicle capacity to a paved lot with a 75-vehicle capacity; and the construction of a Visitor Center overflow lot along Old US 41 that can accommodate 300 vehicles. This facility was developed in partnership with the Cobb County and ownership has not been formally transferred to the NPS, although the NPS operates and maintains the lot.

Anecdotally, the lots with the highest utilization rates are the Visitor Center lot and the Burnt Hickory Road lot, which even after expansion consistently reach or exceed capacity during peak periods. The Cheatham Hill lot is underutilized due to the difficulty in accessing it during peak periods, when congestion on Dallas Highway (GA 120) makes turning out of Cheatham Hill Drive exceedingly difficult.

One parking lot, located on Cheatham Hill Road just north of the intersection at Powder Springs Road, is designated for vehicles with horse trailers only.

Park staff report “lack of parking” as the complaint they receive most frequently from visitors, despite the recent expansions in parking capacity.

## **PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES**

Kennesaw Mountain NBP features an extensive network of trails, including 22 miles of designated trails within the park boundary, 12 miles of which are open to equestrian access.<sup>3</sup> The trail network provides access to historical and cultural sites in the park, and also attracts large numbers of recreational users. Interpretive trails can be found at Cheatham Hill, Pigeon Hill, and on top of Kennesaw Mountain.

The mountain trail runs from the Visitor Center to the parking area at the top of the mountain, and parallels Kennesaw Mountain Drive for much of its length. This trail is popular with visitors seeking to reach interpreted sites and vistas on the mountaintop.

A multi-use trail runs along the south side of Old US 41 and continues along the west side of Kennesaw Avenue at the northern end of the park. This trail connects the overflow lot to the Visitor Center, and also links to trails in the park and to a neighborhood trail connection east of Kennesaw Avenue. The portion of the trail between Stilesboro Road and the Visitor Center overflow lot was installed in conjunction with the construction of the overflow lot.

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<sup>3</sup> NEPA Process for the Kennesaw Mountain National Battlefield Park Trail Management Plan and Environmental Assessment, Sept. 2009.



A new multi-use trail on the south side of Old US 41 connects the overflow lot to the Visitor Center.

Dallas Highway (GA 120) bisects the park at its midsection and creates a barrier to north-south trail connectivity within the park, as relatively high vehicle speeds and traffic volumes pose challenges to pedestrian and bicycle crossings despite the presence of a crosswalk across Dallas Highway at Cheatham Hill Drive.

#### **ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)**

The park operates a shuttle service between the Visitor Center and the top of the mountain via Kennesaw Mountain Road. The service runs on weekends only, when Kennesaw Mountain Road is closed to private vehicles. The charge for the shuttle is \$3.00 for persons aged 12 and over and \$1.50 for children ages 6 to 11; children under 6 ride for free.



The shuttle provides weekend service between the Visitor Center and the summit of Kennesaw Mountain.

The park also regularly hosts school and tour groups that arrive by charter bus; the park charges a fee per bus for charters, while school groups are free. The fee is taken from the NPS Commercial Tour Fee Schedule and is based upon the nature of the tour and size of the tour group. The fees are \$25 (1-6 persons), \$40 (16-25 persons), and \$100 (26+ persons).

## **Funding and Partnerships**

### **ROADS**

Perhaps the most innovative practice taking place at Kennesaw Mountain NBP is the park's partnership with Cobb County for roadway maintenance. The park issues a Special Use Permit (SUP) to the Cobb County Department of Transportation to perform right-of-way maintenance on all state and county routes within the park. This arrangement has allowed the park to share the cost and burden of maintaining some roadways within its boundary while avoiding further encroachment on the park boundary that may occur if NPS were to cede ownership of those roads to the county. Doing so would effectively reduce the park's boundary and limit the park's asset management options going forward.

Park staff reported that the SUP with the county can lead to disagreements over roadway design, as the county has a single design standard that is sometimes at odds with NPS standards.

Even with this unique partnership with Cobb County, the park continually faces funding shortfalls and cannot fully fund its transportation needs, whether road-related or otherwise. The park has explored implementing fees for using the park in the past, but has taken no action to date. The park currently does not charge a fee for admission.

### **PARKING**

Construction of the Visitor Center overflow lot was funded by the county, which had purchased the land from CSX. The lot lies adjacent to CSX tracks that pass through the northern end of the park. Ownership has not been formally transferred to the NPS, although the NPS operates and maintains the lot.

### **PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES**

Due to budget and staffing constraints, Kennesaw Mountain NBP performs no maintenance on trails within its boundary. All trail maintenance is done by the Kennesaw Mountain Trail Club, a volunteer organization.

The Park's management team is currently seeking \$5.8 million in FLTP funds for multi-use trail improvements in the park.

The park also partners with Cobb County on maintenance of some trails outside the park boundary, including several shared-use paths that link the park to surrounding areas. The multi-use trail along Old US 41 and Kennesaw Avenue is the result of a partnership effort between the park and the county.

### **ATS**

Kennesaw Mountain NBP owns a hybrid bus that it operates on weekends on Kennesaw Mountain Drive. Fuel and maintenance costs for the vehicle are estimated to be \$6,000 to \$7,500 annually. The park also pays approximately \$28,000 per year for shuttle drivers.

Park staff reported that the cost of operating the shuttle has approximately doubled in recent years, due to the need to purchase a handicap accessible bus. The park previously contracted with an external operator that used school buses on the Kennesaw Mountain Drive route, at an annual cost of approximately \$26,000.

Park staff estimated that approximately one-third of the shuttle operating costs are covered through farebox recovery. The park uses base operating funds to cover the remaining cost of shuttle operations. The use of base operating funds means that those funds are not available for

other park needs.

Multiple attendees of the site visit noted that inability to support ATS through farebox collection and the use of base operating funds to fill the gap in ATS funding are common themes throughout the region. Park staff requested that the SER LRTP highlight the need for more complete and reliable funding for alternative transportation.

In 2010, the Volpe Center conducted an assessment of the shuttle service as part of a broader assessment of the management of Kennesaw Mountain Drive. As part of that assessment, Volpe recommended expanding the shuttle service to operate seven days a week. During the Focus Park site visit, park staff stated that, while they support that recommendation, it doesn't seem to be financially feasible to implement at this point.

## Sustainable Operations

### Environmental Sustainability

The park's commitment to environmental sustainability can be seen in the recent purchase of a hybrid gasoline bus to replace the school bus that had previously operated on Kennesaw Mountain Drive. The park made the decision to purchase an alternative-fuel bus rather than a conventional vehicle in an effort to reduce emissions and noise within the park.

According to the 2013 State of the Park Report, the park recently took steps to mitigate its energy consumption, including installing a 60KW solar array on the roof of the Visitor Center and installing energy-efficient lighting, that reduced energy use by 64% in 2012 compared to the average for the previous three years.

### Financial Sustainability

#### FUNDING

A consistent theme voiced by park and regional staff during the Focus Park visit was chronic underfunding of transportation needs in the park. As mentioned previously, the park uses base operating funds to cover the gap in ATS funding, which reduces the resources available for other transportation projects. Park staff must therefore choose a limited number of transportation projects to fund, while leaving numerous other legitimate needs unfunded each year.

Federal funding opportunities have proven tricky since the passage of MAP-21 in 2012. The Sarbanes Transit in the Park (TRIP) program was discontinued under MAP-21, but is deemed to be covered under the Federal Lands Transportation Program (FLTP) (formerly the Federal Lands Highway Program – FLHP). However, multiple Focus Park visit attendees discussed the difficulty that parks face in accessing O&M money in this new policy environment. Attendees also emphasized the need to find new sources of funding, and cited multiple examples:

- FTA Ladders of Opportunity, for which O&M is an eligible use
- Highway Safety Improvement Program
- Rivers, Trails, and Conservation Assistance (RTCA) Program, which can provide assistance with grant writing

#### STAFFING

Staffing is another major challenge for the park. Park representatives reported that staffing has decreased while demands on the park have increased. Using operating funds to fill gaps makes it difficult to replace high-grade staff with similarly qualified employees; park staff cited multiple instances in which the park lost talented employees because it lacked the funds to convert them from term/seasonal to full-time. Increasingly, the park is relying on volunteers to fill staffing needs, which staff feel is not a sustainable practice in the long run. This theme of “doing more with less” was cited as common across the entire NPS.

The park has a permanent staff of 14, most of whom play multiple roles in managing park operations. Chief Ranger Anthony Winegar reported that, in addition to overseeing law enforcement in the park, his responsibilities include interpretation, special use permits. Volunteers in Parks projects, cultural and natural resource management, and lands/roadway related projects.

According to the site visit attendees, the impacts of the staffing shortage are felt park-wide:

- **Condition of transportation assets.** The park has neither the funding nor staffing to maintain trails, and relies on volunteers to handle trail maintenance.
- **Enforcement.** As part of the Park's MOU with the Cobb County Police Department, Cobb County expects the park to handle all non-fatal traffic incidents in the park; however, the park has only three full-time law enforcement officers and does not maintain a 24-hour shift.
- **Natural and cultural resources.** The park does not have a natural resources person on staff, and therefore cannot sufficiently address issues related to planning for climate change or preservation of historical and cultural resources.
- **Safety.** The park reports a proliferation in the deer population and a corresponding increase in wildlife crashes; however, the park has no one on staff to analyze the deer proliferation issue. Currently, the chief ranger is working with the Southeast Regional Office to implement a deer management plan.

## Safety

### Intermodal Conflicts

#### KENNESAW MOUNTAIN DRIVE

Intermodal conflicts are common in multiple locations in Kennesaw Mountain NBP, but most notably on Kennesaw Mountain Drive. Park staff report a notable increase in recent years in the number of users, the number of intermodal conflicts, and the severity of crashes.

On a typical day, a variety of different groups—private vehicles, bicyclists, pedestrians, and the shuttle bus—can be found using the mountain road simultaneously for recreation and to access the cultural, historical, and recreational offerings at the summit. Kennesaw Mountain Drive does not have shoulders, which means that all of the various user groups are operating in the roadway. It should be noted that private vehicles, bicyclists, and the shuttle bus never operate on the mountain road during the same time periods, due to the fact that the shuttle operates only at times when private vehicles and bicyclists are excluded from the mountain road. Many pedestrians choose to walk in the roadway rather than using an off-road trail that also provides access to the summit, possibly due to the fact that the road offers a paved surface and sweeping views of downtown Atlanta and beyond. The park directs pedestrians to walk in the outside (downhill) lane of Kennesaw Mountain Road.

One of the primary safety concerns on the mountain road is bicyclists traveling at excessive speeds. The posted speed limit on Kennesaw Mountain Road is 25 mph, and the speed limit signs include supplemental signage that states, “Including Bicycles.” According to park staff, however, bicyclists regularly exceed the speed limit when traveling downhill on the mountain road, which is particularly problematic given that pedestrians traveling in both directions are encouraged to use the outside (downhill) lane.

The roadway is in relatively good condition, having been microsurfaced in 2013; however, the park faces a pending lawsuit filed by a bicyclist who claims that poor roadway surface conditions prior to the 2013 resurfacing led to a crash and subsequent injury. Speed appears to be the cause of the crash according to the final report conducted by the NPS and the Cobb County Police Department park staff. Park staff noted that microsurfacing is not an effective treatment in parking areas due to the higher impact of wheel turning on the pavement surface.

The Volpe assessment, which focused on intermodal conflicts on Kennesaw Mountain Drive in addition to shuttle operations, recommended that shuttle service be expanded to seven days a week and that private vehicles be excluded from the mountain road at all times, and that the road cross section be reconfigured to create a buffered pedestrian facility on the roadway.

The park has considered closing the road to bicycles or excluding private vehicle access at all times, but has not yet implemented any of such measures. According to Superintendent Nancy Walther, managing private vehicle traffic would be the easiest to implement, but could have a serious impact on accessibility. While Park staff understand the Volpe study and support its recommendations, they feel that the recommended countermeasures are not financially feasible at this time.

## PARKING

Park staff reported that changes in parking management have helped reduce fatal crashes and near misses by reducing the availability of roadside parking. The park removed roadside parking spaces in conjunction with construction of the Visitor Center overflow lot and the Burnt Hickory Road lot, and in doing so removed the sources of a large number of vehicle-pedestrian conflicts in the park.

Even with the additional capacity, however, the Burnt Hickory Road lot still does not have enough spaces to accommodate demand during peak periods, and as a result traffic sometimes spills back onto the roadway from the lot, creating a potentially hazardous situation on Burnt Hickory Road.



The Burnt Hill Road parking lot expansion has tripled the lot's capacity to 75 spaces, and has allowed the park to eliminate parallel parking along the roadside.

## Data Gaps

Park staff identified gaps in data as a major obstacle to improving safety within the park. Most problematic is a lack of sharing of crash data among various law enforcement entities in the area. For instance, the Cobb County Police Department doesn't share crash data with the park, and park law enforcement doesn't report crashes to the state. Furthermore, Cobb County has a 45-minute clearance goal for all crashes in order to limit the impact on roadway operations; this emphasis on clearing crashes in a timely fashion can make it difficult to collect accurate data at crash sites.

Park staff also expressed frustration with the Department of Interior's Incident Management, Analysis, and Reporting System (IMARS). Difficulties in getting the interactive PDF form to work has forced the park to scan in all crash reports rather than entering them into IMARS, and has limited the park's ability to manage, analyze, and share crash data.

## User Experience, Mobility, and Access

### Visitation

Kennesaw Mountain NBP welcomed more than 1.9 million recreation visitors in 2013, making it the most visited battlefield in the NPS system. Recreation visitation at the park has more than doubled over the past two decades, rising from 929,767 visitors in 1993 to 1,924,076 visitors in 2013. In that same time frame, non-recreational park visits rose 145 percent, from 10.4 million to 25.5 million. Pass-through commuter traffic constitutes the vast majority of the non-recreation visits, with most of the remainder of the non-recreation visits accounted for by people accessing inholdings within the park. The dramatic increase in both recreational and non-recreational visits reflects the tremendous growth that has taken place in Cobb County and the rest of the northern metro area in the past 20 years.

Park staff estimated that approximately 80 percent of visitors come to Kennesaw Mountain NBP for recreation, rather than for historical interpretation. Most visitors come from metropolitan Atlanta, with a majority coming from Cobb County.

The park hosts a sizeable number of group visits, including school groups, children's organizations, and military groups. The park charges \$190 for a special-use permit, which is provided only after the proposed special event undergoes a screening process.

Park staff emphasized that not all local residents have the same needs and concerns. For instance, inholding residents tend to be more resistant to changes to the park transportation system than other local users.

### Mobility and Visitor Experience

Transportation plays a vital role in the visitor experience at Kennesaw Mountain NBP, as virtually all recreation visitors interact extensively with the park's transportation system during their visits. Some aspects of the transportation system—such as the coverage of the trail network, proximity of parking areas to recreation and interpretation opportunities, and the provision of alternative transportation in the form of the weekend shuttle—significantly enhance mobility and visitor experience. Other aspects detract from the visitor experience, most notably congestion on roads in and around the park and multimodal conflicts on Kennesaw Mountain Drive.

The park has taken multiple steps to mitigate conflicts on Kennesaw Mountain Drive in an effort to both bolster safety and improve the visitor experience. Foremost among those efforts is the engagement of the Volpe Center to identify an array of countermeasures that could improve conditions on the mountain road. Other measures include installation of a supplemental speed limit signage and a radar speed sign on the downhill side of the roadway in an effort to control vehicle and bicycle speeds.

Increasing levels of congestion in and around the park limit visitor mobility and have had a profound effect on visitor experience. Park visitors must use Old US 41 or Stilesboro Road, or both, in order to reach the Visitor Center and Kennesaw Mountain Drive. Both of these roadways are commuter routes and experience high levels of congestion in the vicinity of the Visitor Center during peak hours. Congestion on Dallas Highway leads to underutilization of Cheatham Hill Drive and the Cheatham Hill parking lot, as visitors have difficulty finding sufficient gaps to turn left into or out of Cheatham Hill Drive and therefore avoid accessing the park in that location. Congestion often makes it challenging to access the park from any direction during peak hours.

The park anticipates that the construction of the new Atlanta Braves stadium in Cobb County will

increase congestion in and around the park. The stadium, which is slated to open in 2017, will be located approximately 10 miles southeast of Kennesaw Mountain NBP.

In discussing ways to enhance the visitor experience, park staff cited the park shuttle as an obvious opportunity. The shuttle currently holds little appeal for visitors, as there is no interpretation on board and the interpretation of historical and cultural resources at the summit are limited by staffing and volunteer availability.

A prior effort to improve visitor experience entailed an interior vehicle tour route on park roads, which was proposed as part of the 1983 General Management Plan. The tour route idea ultimately was tabled after opposition by landowners with private inholdings in the park.

## Multimodal Connections

There are multiple multi-use trail connections between the park and surrounding neighborhoods, although visitors have requested additional facilities that would allow greater bicycle and pedestrian access to the park. During the Focus Park visit, park staff mentioned their preference to establish more neighborhood trail connections to meet demand. The park continues to work with the county to identify opportunities to fill gaps in the multi-use trail network within the park and to connect to adjacent county facilities.

Two Cobb County Transit (CCT) bus routes run within a quarter mile of the park boundary; however, there are no transit stops close to the park. The park used to be served by a CCT transit stop at the southern end of the park, but that stop is no longer in operation. The park is currently working with the county to reestablish a stop in the vicinity of Powder Springs Road at the southern end of the park. Establishing a transit connection could have multiple benefits: it could increase visitation, provide access to the park for underserved populations, and it could allow the park to access Federal Lands Highway Program (FLHP) Category III funding for alternative transportation.

## Mode of Access

Nearly all visitors to Kennesaw Mountain NBP arrive by private vehicle or tour bus, or walk from surrounding neighborhoods. Due to congestion in the park and perceived challenges in finding parking in NPS lots, some visitors park private vehicles on neighborhood streets along the park boundary and walk into the park. Use of transit to access the park is virtually nonexistent, according to park staff.

## Resource Protection

### Historical and Cultural Assets

Kennesaw Mountain NBP preserves and interprets a variety of historical and cultural assets related to its status as a battlefield and historic site. The most significant of these assets is the more than 11 miles of earthworks located within the park. These earthworks are the original fortifications built before and during the Civil War battle in 1864, and have been preserved in relatively good condition over the 150 years since the battle. The park also features cannon emplacements, historic structures, historical markers, a grave of an Unknown Soldier, monuments and memorials, and waysides.

The park continually seeks to strike a balance between providing safe and adequate access to these historical and cultural offerings while also ensuring that these assets are preserved and maintained for future enjoyment and appreciation.



Clockwise from top left: A wayside on Cheatham Hill; interpretation at the Illinois Monument; a cannon in front of the Visitor Center; and earthworks with an interpretive plaque .

### Negative Resource Impacts

Kennesaw Mountain NBP faces a number of challenges in its efforts to preserve historical, cultural, and natural resources within the park. A major challenge is the sustained increase in visitation and use over the past 20 years; as one park staff member put it, visitors are “loving the park to death.” Heavy use of the park’s transportation infrastructure and congestion in and around the park not only detract from the visitor experience, but also pose threats to the park’s mission as a battlefield park.

Encroachment from nearby development is another serious challenge, as the region’s sustained growth over the past several decades has brought suburbanization right to the park’s doorstep, with the result that the park is now surrounded on all sides by residential and commercial

development. Many private inholdings have been developed, and there is additional pressure to develop the remaining inholdings.

Park staff expressed concern about climate change impacts on the park transportation system, most notably in the form of trail degradation. Persistently dry conditions in the region have turned trail surfaces to fine dust, which washes away during heavy rain events. Two or three such heavy rainfalls can wash away the protective soil layer, and, with many cultural resources located 5-6 inches below the surface, park staff are seeing more instances of exposed artifacts within the park. These conditions have been exacerbated by increased use of the trail system and lack of trail maintenance by the park.



Erosion on the trail to the summit of Kennesaw Mountain.

Park staff also noted that existing waysides are not sufficient to meet the park's interpretive needs. Staff has submitted a PMIS to improve waysides in the park.

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# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



## Mammoth Cave National Park

September 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at Mammoth Cave National Park in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the SER LRTP effort, SER staff have identified nine Focus Park units that are representative of the broad range of units in the region. The SER LRTP core project team will visit each of these Focus Parks over the course of several months at the start of the LRTP effort to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 park units within the Southeast Region, each focus park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

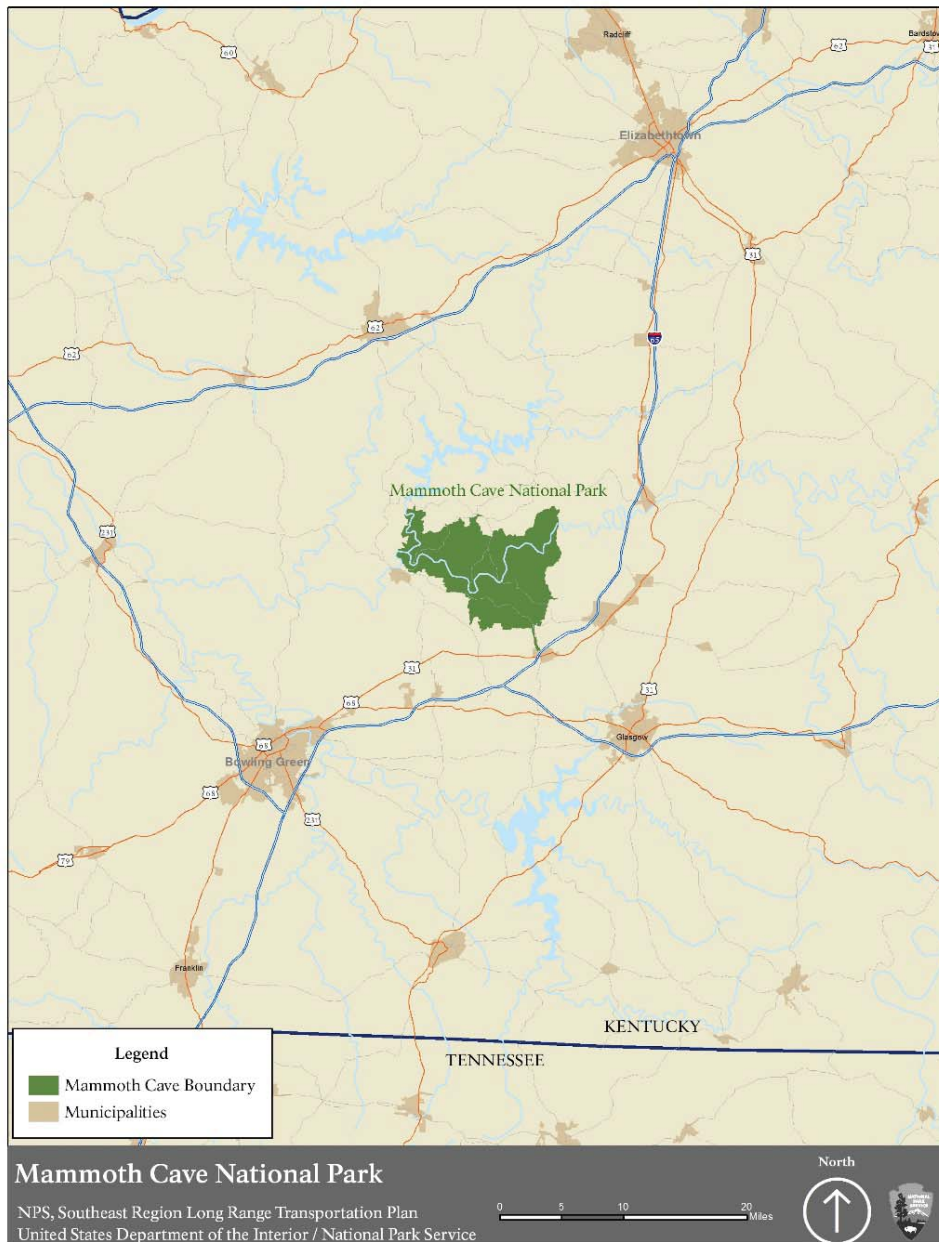
The sixth of the nine Focus Park visits took place at Mammoth Cave National Park (NP) on September 25-26, 2014. The visit included conversations with park staff as well as a park tour and field review to observe firsthand specific transportation assets and conditions. The site visit was attended by the following individuals:

- Sarah Craighead, Superintendent, Mammoth Cave NP
- Bruce Powell, Deputy Superintendent, Mammoth Cave NP
- Steve Kovar, Chief of Facilities Management, Mammoth Cave NP
- Dave Wyrick, Chief of Interpretation, Mammoth Cave NP
- Eddie Wells, Volunteer Coordinator, Mammoth Cave NP
- Mark Rich, Safety Officer, Mammoth Cave NP
- Lora Peppers, Chief Ranger, Mammoth Cave NP
- Mike Tomkosky, Mammoth Cave NP
- Teresa Cantrell, National Park Service Southeast Region
- Nat Grier, VHB
- Corey Pitts, VHB

## Park Overview

Mammoth Cave NP is located in south central Kentucky about 90 miles north of Nashville, Tennessee and 90 miles south of Louisville, Kentucky. (Figure 1). The park, which spans approximately 50,000 acres, was created to preserve the over 400 miles of known limestone caverns and surrounding natural environment. The caves have been a tourist destination since the 1800s. During the Civil War, the cave was mined for saltpeter to be used in manufacturing gunpowder.

Figure 1: Regional Context Map



Source: NPS and ESRI

The primary purpose of the park, which was established in 1941, is to “preserve, protect, interpret, and study the internationally recognized biological and geologic features and processes associated with the longest known cave system in the world; the park’s diverse forested, karst landscape; the Green and Nolin rivers; and extensive evidence of human history; and to provide and promote public enjoyment, recreation, and understanding.”<sup>1</sup> In addition to being a major destination for people interested in seeing the caves, the park is also a destination for people looking to explore the outdoors. The park provides opportunities for hiking, horseback riding, biking, and various paddle sports. The park exhaustively works to control and mitigate the impacts from visitation to the caves, natural areas, and the park’s inhabitants (plants and animals). Protecting endangered species through ecological preservation/restoration, environmental pollution monitoring and mitigating, and controlling invasive species are major efforts in preservation undertaken by the NPS at Mammoth Cave.

Mammoth Cave’s location just north of Bowling Green and south of Louisville near the Interstate 65 corridor means the park is easily accessible to a large number of people. The area surrounding the park is rural, but as Bowling Green, Kentucky’s third largest city, continues to grow, development pressures begin to creep closer. The park’s visitor center is located 5 miles from the interstate and the actual park boundary extends to I-65, meaning that the park is confronted with the environmental impacts of a high-volume highway. The park itself isn’t impacted by congestion from the area’s commuters, but will have high volumes of traffic associated with visitors during the weekends and summer months. There is regional traffic that does pass through the park, especially on Route 70 and at the Green River Ferry crossing. The capacity of the ferry and time it takes to complete the crossing can result in backups along Green River Ferry Road during high volume periods.

The following sections of the report provide further details on the park’s transportation conditions, challenges, and needs based on the conversations with park staff and field observations gleaned during the Focus Park visit.

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<sup>1</sup> Mammoth Cave National Park Foundation Document, 2014.

## Asset Management

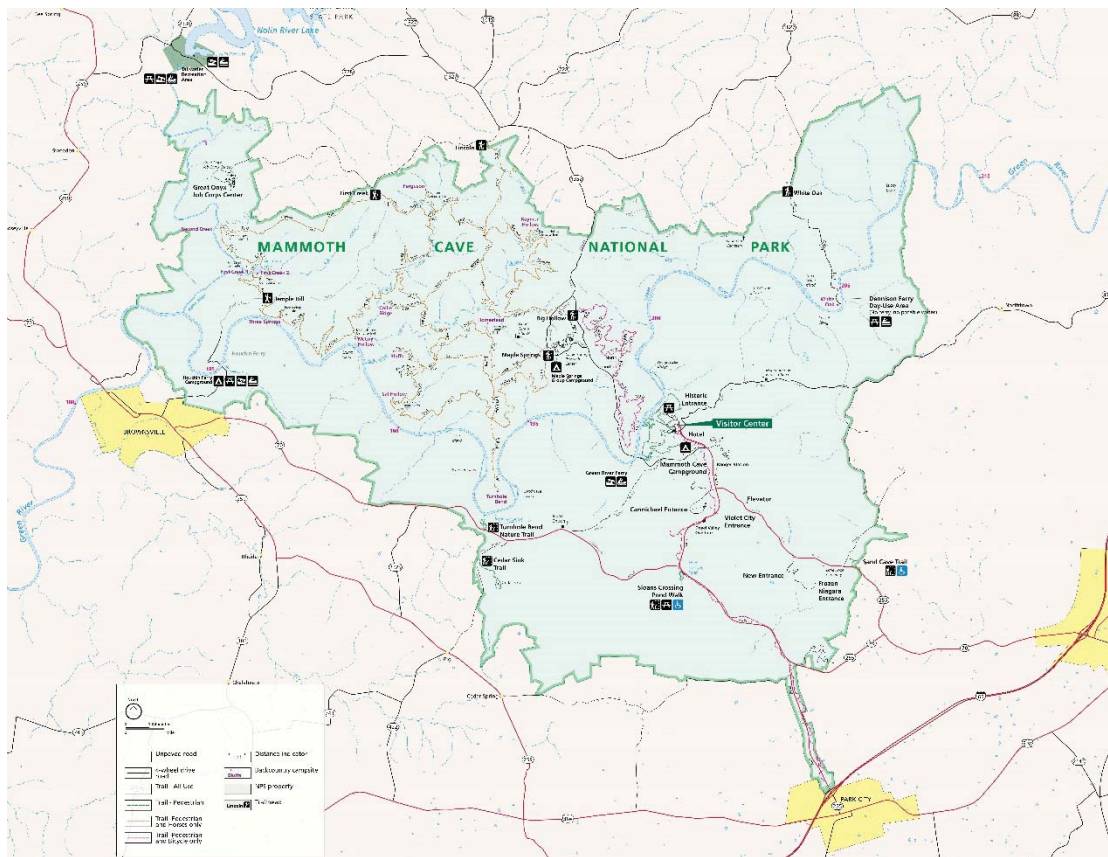
### Transportation Assets

#### ROADS

There are 43 miles of paved roads maintained by the park service. There are an additional 21 miles of roads within the park that are unpaved, totaling approximately 64 miles of roadway. See Figure 2 for a park map.

There are four major roads that travel into or through the park. Cave City Road (KY-255) and Mammoth Cave Road (KY-70) travel 7.8 miles from Cave City near the Exit 53 interchange of I-65 into the park, terminating at Mammoth Cave Parkway. Park City Road (KY-255) travels 2.7 miles from Park City near the Exit 48 interchange with I-65 into the park, terminating at Mammoth Cave Parkway. Mammoth Cave Parkway spans the 5.6 miles from the Visitor Center to the south and east where it terminates at Cave City Road outside the park. Brownsville Road (KY-70) travels 9.8 miles from Brownsville to its intersection with Mammoth Cave Parkway.

Figure 2: Map of Mammoth Cave NP

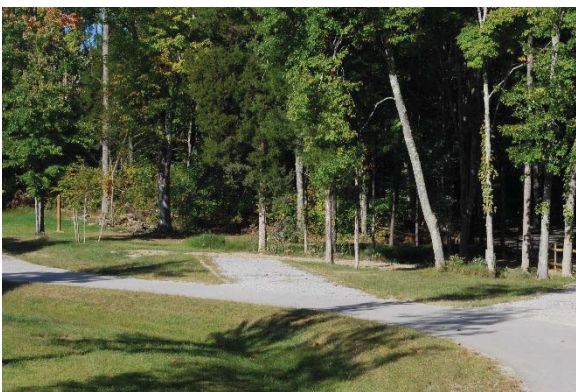


Source: NPS.

## PARKING

Mammoth Cave NP has 48 parking lots of varying size and levels of utilization. All parking lots in the park are free of charge, and almost 70 percent of the lots are paved. Parking accommodates visitors to specific sites, trailhead access, parking for horse trailers, parking for camping, and parking for park service vehicles. During high visitation periods the shoulder of the Mammoth Cave Parkway on the approach to the Visitors Center and some of the grassy fields around the Mammoth Cave Hotel are utilized to park vehicles. These areas are limited during periods of wet weather if the ground is too wet. Parking along the shoulder is also utilized along the approach of Green River Ferry Road to the river for people accessing the river for canoe and kayak launching or pickup.

Like many parks, demand for parking has high temporal variation. Parking lots can fill on summer and fall weekends and some Fridays but may have little or no use mid-week. Special events result in a noticeable excess demand, though this is normally accommodated through the designated overflow lots. Similarly, during peak equestrian use times, the areas designated for horse trailer parking may fill. There are many trails that are used by a multitude of different user groups. Parking isn't specified for horse trailer parking only in these lots, and sometimes parking spaces designed for trailers becomes occupied by non-trailer vehicles.



Clockwise from top left: Visitor Center Parking; Parking at Mammoth Cave Hotel; Parking at Green River Ferry; Horse trailer parking at Maple Springs Trailhead

## **PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES**

Mammoth Cave NP has roughly 140 miles of trails, including those within the caves. Many of the trails are designed for multiple user groups. Trails range from single-track dirt trails to wider packed gravel trails. There are over 15 miles of trails associated with the cave tours, well below the over 400 miles of actual cave that has been surveyed. Efforts are currently underway to rehabilitate the first mile of trail along the cave floor that is walked during the Historic Tour. Work will include the installation of concrete pavers, at-grade boardwalks, lint guards, safety rail and other improvements designed to minimize impact to cave resources. This is the most popular cave tour and the installation is in an effort to improve the safety of the trail which has deteriorated since construction in the 1940s and to reduce the amount of dust that gets disturbed, impacting the air quality in the cave. The tour route includes the only underground FHWA-inspected bridge.

Mammoth Cave provides over 65 miles of backcountry trails, primarily for use by hikers and horseback riders. The Maple Springs trailhead provides an accessible mounting ramp for horseback riders. The Big Hollow Trail is a roughly 10-mile trail in the backcountry, of which approximately 8 miles is open to mountain bikers. There are also 7 miles of trails surrounding the visitor center, providing guests access to the river, overlooks, and to the Historic Entrance.

Biking is allowed on all of the paved and unpaved park roads within Mammoth Cave NP. In addition, off-road riding is allowed on designated trails as well as the park's unpaved administrative roads. There are over 20 miles of designated off-road trails open to bikes. These include the Big Hollow, Maple Springs, and White Oak Trails in the backcountry as well as the Mammoth Cave Railroad Bike and Hike Trail. The latter is a crushed gravel trail traveling 9 miles from the Mammoth Cave Hotel into Park City. The trail recreates portions of the old Mammoth Cave Railroad line which carried visitors from Glasgow Junction (Park City) to the Cave prior to the proliferation of the private automobile.

## **WATER FACILITIES**

Both the Green and Nolin Rivers pass through Mammoth Cave NP and provide visitors a variety of recreational activities on the water. Fishing, canoeing and kayaking, swimming, and camping all occur in or along these rivers. There are three locations along the 26 miles of Green River located within the park for launching water craft. The Dennison Ferry launch has steep grades and is designed for smaller craft, while the Green River Ferry and Houchins Ferry launches are able to accommodate larger craft being launched via trailer. Launches and take outs at the Green River Ferry site need to be coordinated with the ferry operator. The ferry cannot operate when people are trying to launch or take out. The existing launches are insufficient to handle the volume of activity the park receives during high visitation periods, creating safety concerns at the Green River Ferry site. Plans for lowering the approach and constructing a more substantial launch and take-out site have been made for the Green River Ferry site that would place greater separation between the launch and the ferry. The park also has a number of outfitters who provide canoe and kayak gear as well as guided trips.



*Left: Accessible horse mounting ramp; Right: Green River Ferry and the launch/take-out.*

### ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

The park currently provides two forms of alternative transportation systems within the park. The park has two locations where they provide ferry crossings: the Green River and Houchins ferries. Currently, the Green River Ferry site is the only active site due to budget constraints. Both sites are currently in need of upgrades to the ramp due to fluctuations in the water level of the river. The Green River Ferry site is a vital crossing for local traffic traveling through the park. The Green River Ferry operates year round, except Christmas day, from 6:00 a.m. to 9:55 p.m. The only exceptions are when water levels on the Green River are dangerously high or low. High water levels, and the associated current, make it too dangerous for the ferry to safely load/unload vehicles. Low water levels restrict the ability for vehicles with trailers, such as horse, to board the ferry due to the angle with the road—in general, oversize vehicles, including RVs, are prohibited because of length constraints.

The Houchins Ferry crossing has been closed since 2009. Due to budget constraints and the low vehicle demand, this site will likely remain closed into the future. The Houchins Ferry campground, on the south side of the crossing, remains open.

Mammoth Cave NP provides transportation to cave tours not associated with the Historic Entrance via buses. The buses are owned by the park, but operated through a concession agreement. The buses move approximately 180,000 visitors each year. Currently, the concessionaire operates eight buses used to access five tour entrances: the Great Onyx, Carmichael, Violet City, Frozen Niagara, and New Entrance. In 2010, the park constructed a bus loop at the Visitor Center to help alleviate some of the issues with bus operations. The buses currently pick up tour visitors at the loop and drop off tour visitors in front of the hotel during the spring, summer, and fall seasons. This arrangement was made at the request of the hotel, who felt foot traffic through the hotel to the gift shop and café would increase by having them walk through the hotel to return to the Visitor Center. This arrangement does result in some conflicts between the buses and people walking to the hotel from the parking lots on busy days. Pick up and drop off occurs at the loop only in the winter months, while the hotel operates with restricted services.



Clockwise from top left: Cave Tour bus; Green River Ferry; Houchins Ferry; Cave Tour bus loop pick-up (Shelter A).

## Funding and Partnerships

### ROADS

The park did not note any significant funding challenges for road projects outside of not having enough funding to meet every need on an annual basis and having to prioritize projects. This is the same problem confronting every park unit, county, state, and federal highway agency.

Park staff noted that there are discussions to improve Flint Ridge Road to allow improved access from the north and to Dennison Ferry. This would be a cooperative project with local government.

The upgrade of Route 70 southeast of the Park was cooperative with the State and local government to improve east-west movement and safety. The Park realigned the intersection of Route 70/Mammoth Cave Pkwy and Park City Road to promote this realignment, but the realignment at the intersection of Route 255 and Route 70 at Turley's Corner has yet to occur, though may still, and would be funded by the State, largely with Federal aid money.

As at many parks, the Park has had mixed success in installing and updating wayfinding and other brown signs outside of the park boundaries.

### PARKING

The Visitor Center lot was upgraded relatively recently. The park is developing plans to improve the hotel parking lot as well. There is some discussion of improving the access and usability of the overflow lots, but there is concern of the visual and environmental impacts. Similarly there are capacity issues at several water access points, but no current plans for expansion.

## **PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES**

The surrounding communities have had discussions with the park about extending the trail network to their boundaries and creating additional connections for biking. Both Cave City and Brownsville have asked about extending the trail network, plans were developed for an extension to Brownsville, but funding has not been obtained to complete construction. The Mammoth Cave Railroad Bike & Hike Trail was completed with Rails to Trails funds.

## **ATS**

The existing ferries have had issues with the fluctuating levels of the Green River. The Houchins Ferry has been closed due to funding cuts with no immediate plans for re-opening the ferry. The Green River Ferry plays a significant role in the local transportation network beyond providing access to other parts of the park. Improvements for extending the ramps on both sides of Green River Road have been identified, along with creating a new canoe and kayak launch and takeout facility to handle the increased volume and improve safety. The improved launch is not programmed to be constructed until 2018. General maintenance and upkeep of the ferry is a challenge. There is a significant training requirement for the operators due to the requirements associated with US Coast Guard certification. Additionally, every two years the ferry cables are replaced and the ferry itself is pulled out of the water for inspection. The newer ferry boat is located at Houchins and will likely take the place of the Green River Ferry at some future point. The outdated ferry will be retained to provide spare parts for the operational ferry. Yearly operational costs of the Green River Ferry are approximately \$100,000 per year and are paid for out of the park's base operating costs.

## Sustainable Operations

### Environmental Sustainability

Mammoth Cave NP has many environmental concerns they are monitoring and attempting to mitigate in an effort to reduce the impacts to the natural environment. The formation of the caves thousands of years ago due to water infiltrating the surface sandstone and eroding the underlying limestone is still occurring today. This continued interaction and the ecosystem it created within the cave network is impacted by larger regional waterways leading into Mammoth Cave NP. As such, the park is dedicated to monitoring pollutants within the water as well as runoff. As part of this protection, the park is working to enhance the water quality of road and parking lot runoff from storm events and has already installed an oil and grit separator in the Hotel parking area. Additionally there is substantial concern about the potential impact of spill of hazardous materials. The park also works with partner agencies to understand and monitor water quality within the region as much of the water in the park infiltrates well outside the park boundaries.

The park routinely monitors ambient concentrations of ozone (O<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), nitric oxide (NO), total reactive nitrogen (NO<sub>y</sub>), and particulate matter (PM<sub>2.5</sub>, and PM<sub>10</sub>). The park also routinely monitors visibility, atmospheric deposition, and meteorology. The park is designate as a Class 1 airshed and anticipates being declared a non-attainment area for ozone; the primary concern is with electrical generating stations, stationary sources, and mobile sources.

The monitoring of air quality and flows extends to the caves. Changes in air flows are believed to be impacting bat populations. In an effort to protect the caves' environmental integrity of the while mitigating impacts to the native species, the park installed security gates that allow for the movement of bats in and out of the caves while maintaining the exchange of air at appropriate rates.

Another challenge to the bat population has been the introduction of White Nose Syndrome, a fungus that is adversely impacting bat populations. To minimize the potential of tour visitors transporting the White Nose fungus outside the park, the park has installed White-nose Stations to decontaminate visitors' shoes upon exiting the caves.

The park also utilizes alternative fuels on a number of the vehicles in the park's fleet. Many of the vehicles are currently using propane as opposed to diesel. This includes four buses of the eight-bus fleet, both ferries, and many of the administrative and maintenance equipment, including two lawn mowers. The park was the first Department of the Interior unit to install a biodiesel fuel station. The park does use electric vehicles for some of the utility vehicles, with a consideration for adding electric cars and all-terrain vehicles. The recent renovation and expansion of the park's visitor center was completed under the Green Building Council's Leadership in Energy and Environmental Design (LEED) guidelines. This resulted in the building receiving LEED Gold certification. They are planning to install hybrid vehicle charging stations in the Visitor Center Lot.

## SER LRTP Focus Park Visit Summary: Mammoth Cave NP



Clockwise from top left: Electric Park Service vehicle, alternative fuel Park Service van, Liquid propane gas fueling station, Leadership in Energy and Environmental Design (LEED) Gold award for the Visitor Center.

Park staff are working to understand the overall capacity of the existing infrastructure, particularly for the cave and the river. While there are limits on individual tours, these are primarily logistical, related to bus operations or availability of staff. The park is trying to understand whether there are inherent carrying capacities of the caves, river and trails to understand how best to manage the assets in the future.

The Park is also trying to ensure it is night-sky friendly and looking to limit the use of outdoor lighting or develop the ability to turn lights off to assist with evening programming.

## Financial Sustainability

### FUNDING

As with all units, funding continues to be a challenge. Mammoth Cave NP is fortunate in that they have fee revenue to provide additional flexibility in operations and budgeting. The park identified a number of improvements to enhance access and the visitor experience that are currently unfunded. Similarly, without substantial improvement to available funding, the Houchins Ferry will remain out of service for the foreseeable future.

### STAFFING

The Park has a robust staff, with much of the staff focused around the interpretation, maintenance, and resource management of the caves. The primary concern related to transportation is the certification of the ferry operators and ensuring the staff are able to maintain that certification given the regular training requirements.

The park is the exclusive law enforcement agency within its jurisdiction, so the Park maintains a number of officers. They coordinate with local jurisdictions for life safety: the Park secured funds to purchase an engine which resides in the Park City Fire Department, which is also responsible for fire protection for the park.

## Safety

### Intermodal Conflicts

The park had a road safety audit (RSA) completed in August 2011. The park felt that the data that was used to justify the RSA overrepresented the severity of crashes occurring within the park. The RSA concluded that the highest priority crash type to address were single vehicle, road departure crashes. The assessment determined that there was no single concentrated location, but rather many scattered locations along the parks major roads. A common characteristic observed was the presence of horizontal curves. Recommendations included a wider edge line, rumble stripes/strips, uniform application of warning signage, and the uniform application of speed zoning. Other suggestions included upgrading signage to comply with the most recent retroreflectivity standards, addressing guardrail deficiencies, and controlling the deer population. Several of the recommendations from the report have since been implemented.

The park did not comment on any single problematic location within the park. Some of the areas already mentioned include the conflicts between the Green River Ferry and the volume of canoe and kayak traffic and the launch and takeout. This should be resolved when the new launch/takeout is constructed. There is concern that when Lock & Dam 6 is removed, the increased flow speed will increase recreational water use on the river, particularly at Houchins, and could increase conflicts with the Ferries as well as put-in/take-out operations. There is also a concern about the drop in the elevation of the river if Lock & Dam 6 is removed (an anticipated three-foot drop at the Green River Ferry and a nine-foot drop at the Houchins Ferry).

Another problem area discussed was the area around the Doyel Valley Overlook. The construction of the boardwalk on the opposite side of the road resulted in random road crossings by pedestrians. This area was examined during the RSA and some recommendations were developed. The park did not remove the *Congested Area Ahead* signs or install variable speed signs to be activated when pedestrians are present. They did install a crosswalk at this location, which anecdotally has resolved the problem with random crossing locations.

Winter weather operations were raised as another area of general roadway safety concern. The park has limited snow-clearing equipment and it is not uncommon to get sufficient snow to make the roadways unsafe. As it is rare that the snow is an issue for a multi-day period, the primary concern is that there are not gates to close the park roads when they feel it is necessary to close the park. Installation of ITS, such as variable message signs, would also help in notifying the public of closures of roads, ferries, etc. As with many parks, the issue of bicycle and equestrian traffic conflicts arises regularly. They have addressed this primarily by focusing on hiking/biking trails and hiking/equestrian trails, with limited numbers of trails available to all three users.

There has been some disagreement over the “official” route into the park, but this has been more of a political issue between the municipalities that are gateway cities to the park. Money was spent to improve Park City Road and adjust the alignment with Mammoth Cave Parkway to make it the main route to the visitor center. Cave City felt that the route along Cave City Road had always been the main route, and the park realigned Mammoth Cave Parkway and Park City Road to a more traditional T-intersection with a stop from Park City Road. However, an agreement on how to realign Mammoth Cave Parkway and Cave City Road at Turley’s Corner could not be reached. This has led to confusion for visitors as to which route should be used to access the park. Complicating this issue is privately-owned signage that informs the public that continuing straight along Cave City Road is the shortest route into the park. The park would like visitors coming in from Cave City to turn onto Mammoth Cave Parkway and avoid Cave City Road north of Turley’s Corner because of the horizontal curves and the bus traffic associated with cave tours. Discussions

about revising signage to direct traffic down Mammoth Cave Parkway as a temporary solution until the intersection can be redesigned has been considered.



Clockwise from top left: Radar speed limit sign and warning signage at Doyel Valley Overlook; Intersection of Cave City Road and Mammoth Cave Parkway at Turley's Corner; intersection of Mammoth Cave Parkway and Park City Road; horizontal curve warning.

## Data Gaps

Park staff did not identify specific data gaps as hindering transportation operations or planning. The park keeps generally good visitation estimates for cave tours, bus ridership, river usage, and trail usage.

## User Experience, Mobility, and Access

### Visitation

Visitation at Mammoth Cave was reported at just over 500,000 in 2012. Overall visitation figures appear to be holding steady based on past figures. Recent figures point to a trend of increasing visitation to the Green River area and higher number of water-based recreation activities. Cave visitation has been holding at right around 400,000 visitors per year.

### Mobility and Visitor Experience

Transportation plays a vital role in the visitor experience at Mammoth Cave NP. The primary mode of access is going to be by private vehicle due to the location of the park. Access via Park City is easy and clear. There can be confusion about wayfinding when entering from Cave City and visitors may encounter congestion outside the park. Roadway congestion within the park is rare though there are regular issues in and around the parking areas. The congestion can have an impact on the tour bus schedules in addition to impacting general traffic. Additionally, congestion was reported around the Green River Ferry during the busier times of the year between vehicles wishing to cross the river using the ferry, parking to access the river, and outfitters attempting to collect kayaks. Additionally, the ferry cannot carry cars across the river when people are attempting to launch or take out a canoe or kayak. Plans are in place to try and expand parking and improve the launches.

### Multimodal Connections

The park has a connection to Park City via the Mammoth Cave Railroad Bike and Hike Trail. Additionally, cyclists will enter the park via existing roads. The other multimodal connection outside the park is associated with the Green River. There are some users who will canoe or kayak into the park from outside the boundary and travel through the park, sometimes overnighing along the river.

### Mode of Access

Nearly all visitors to Mammoth Cave NP arrive by private vehicle. A small number may paddle in from the surrounding area via the Green River, but this number is difficult to determine. The other primary mode of access would be via bus tours. There aren't any opportunities for access via public transportation because of the location of the park.

## Resource Protection

### Historical, Cultural, and Natural Assets

The primary asset for the park to protect is the cave system. Included in the protection of the cave system is the protection of the flora and fauna that live in the caves. The park is home to 1,300 plant species, including more than 70 threatened, endangered, or state-list species, and 36 animal species.<sup>2</sup> Beyond the cave system, the park features one of the most biologically diverse river systems in North America.

As mentioned above, the Park Service goes to great lengths to monitor both air and water quality. Efforts to mitigate runoff, reduce the impacts of visitation, and keep an eye on changing air quality are all currently underway. Also inside the caves are manmade items left throughout the history of the caves. Items used from the time the caves were an active mine still remain. Beyond the caves are the protection of the natural habitats and waterways within the park. These areas are home to many species of plants and animals and are also connected to cave. In addition to the abundant natural assets, there are a number of historic churches within the park, many of which are used for services a limited number of times per year.



Clockwise from top left: Canoeing along the Green River; the Historic Entrance to Mammoth Cave; deer grazing near the visitor center; historic artifacts from past mining operations inside the cave.

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<sup>2</sup> Mammoth Cave National Park Foundation Document, 2014.

## Negative Resource Impacts

Efforts to mitigate the negative impacts of visitation to the park are currently underway. These include improvements to the Historic Tour route, including placing pavers and installing lint curbs. Other consideration needs to be given to the growth in use of biking, horseback riding and river travel. The park issues permits to commercial outfitters which allows the park some ability to manage and monitor river use; however, this growth impacts the park's natural resources through increased impacts of use as well as adding to conflicts with other users.

As mentioned earlier, there is concern that Lock & Dam 6 will fail in the future, not only impacting the water currents along the river but also the water levels. Existing challenges associated with water levels on the Green River and the ferry operations, presented in a previous section of this report, will only deteriorate with the loss of the lock and dam.

The areas around the park don't have large land development pressures immediately around the park, but future extension of Interstate 66 as well as the addition of an interchange at US 31 and I-65 could have negative impacts on the park associated with increased air quality and water quality impacts associated with higher traffic volumes in the vicinity.

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# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



## San Juan National Historic Site

November 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at Fort Sumter National Monument in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the SER LRTP effort, SER staff have identified nine Focus Park units that are representative of the broad range of units in the region. The SER LRTP core project team will visit each of these Focus Parks over the course of several months at the start of the LRTP effort to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 park units within the Southeast Region, each focus park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

The ninth and final Focus Park visit took place at San Juan National Historic Site (NHS) on November 12-13, 2014. The visit included conversations with park staff as well as a park tour and field review to observe firsthand specific transportation assets and conditions. The site visit was attended by the following individuals:

- Walter Chavez, Superintendent, San Juan NHS
- Jose Flores, Acting Facility Manager, San Juan NHS
- Yanira Martinez, Management Assistant, San Juan NHS
- Ernesto Padilla, Chief Ranger, San Juan NHS
- Teresa Cantrell, National Park Service Southeast Region
- Lewis Grimm, FHWA-EFLHD (by phone)
- Dan Nabors, VHB
- Kevin Keeley, VHB

### Park Overview

San Juan National Historic Site is located in San Juan, Puerto Rico. The park is located in the historic section of Old San Juan, and preserves and interprets some of the oldest fortifications in the Western Hemisphere and the oldest European structures in the National Park System.<sup>1</sup> The fortifications preserved as part of San Juan NHS remained an active military installation for more than 400 years, first for the Spanish Empire and then for the United States. The park also enjoys designation as a UNESCO World Heritage Site.

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<sup>1</sup> San Juan National Historic Site Park Asset Management Plan, 2008.

Figure 1: Map of San Juan NHS



The park is relatively compact, spanning only 75 acres, and consists of four principal structures:

- ❶ **Castillo San Felipe del Morro**, commonly referred to as **El Morro**, is the oldest of the forts in the park. Construction of El Morro began in 1539, and lasted for nearly 250 years. El Morro sits at the western tip of Isleta de San Juan, the island on which Old San Juan is located.
- ❷ **Castillo San Cristobal** is the second principal fort preserved as part of San Juan NHS. It is located in Old San Juan, approximately 0.8 miles east of El Morro. San Cristobal was the largest fortification built by the Spanish in the New World.
- ❸ **The historic City Wall**, or **La Muralla**, runs along the edge of Old San Juan, stretching from San Cristobal on the north side of the peninsula to just east of the San Juan Gate on the south side. The National Park Service owns approximately 2.5 miles of the historic City Wall, which used to circle the entirety of Old San Juan.
- ❹ **Fortin San Juan de la Cruz**, commonly referred to as **El Canuelo**, is a smaller fort located across San Juan Bay from El Morro. El Canuelo, which is not regularly staffed by the park, is located on a small spit of land that is also home to a state park.

San Juan NHS also owns and maintains the San Juan Gate, which was constructed in 1520 and served as the official entrance for visitors to Puerto Rico for hundreds of years. The San Juan Gate is located at the southeast corner of the park.

One of the park's primary transportation assets is the Paseo del Morro, a waterfront pedestrian walkway that parallels La Muralla. The Paseo, when completed, will provide a pedestrian connection between the San Juan Gate and San Cristobal. Another critical component of the park's transportation system is the tram service, which carries park visitors between El Morro, San Cristobal, and various locations in Old San Juan.

The remainder of the report provide further details on the transportation conditions, challenges, and needs based on the conversations with park staff and field observations during the visit.

## Asset Management

### Transportation Assets

#### ROADS

Due to its compact size and location in an urban center, San Juan NHS has relatively few roadway assets, and relies heavily on the local street network for access to the park. The Commonwealth of Puerto Rico owns the roads in Old San Juan but has turned over responsibility for roadway maintenance to the Municipality of San Juan. Calle Norzagaray, an east-west roadway that borders the park on the north side of Old San Juan, is owned in part by the NPS and in part by the Commonwealth.

The entrance road to El Morro is wholly owned and maintained by the park. The entrance road is closed to private vehicles; the only motorized vehicles permitted on the road are the park tram and NPS vehicles. The park owns a short, unnamed loop roadway that provides access and egress from a pair of parking lots at the Visitor Center at San Cristobal. San Juan NHS also has jurisdiction over San Augustin Road, which runs along the southwest side of the park, although the Commonwealth is the owner of the road.

#### PARKING

There are two NPS-owned parking lots at San Juan NHS, both of which are located at San Cristobal. One lot, which is located behind the Visitor Center and is currently being reconstructed, is reserved for employee and tram parking. The other lot, located in front of the Visitor Center and accessible from Avenida Luis Munoz Rivera, is used for visitor parking and shuttle bus parking; however, the visitor spaces have been reallocated for use as employee parking while the employee lot is under construction. Construction on the employee lot was expected to be completed in December 2014. The employee lot has space for approximately 20 passenger vehicles and three trams. The Visitor Center lot has 25 standard spaces and six shuttle bus parking spaces.

Visitors to the San Cristobal, El Morro, and La Murralla can park in a number of municipal garages in Old San Juan. The municipal garages are relatively inexpensive and generally have ample spaces. Free street parking is also available in Old San Juan, although spaces are limited.

Visitors to El Manueto can use the parking area at the state park adjacent to the fort.

#### PEDESTRIAN FACILITIES

Paseo del Morro is a pedestrian walkway that runs along the San Juan Harbor waterfront, parallel to La Muralla, between the San Juan Gate and the base of El Morro. The Paseo is open from 6 a.m. to 10 p.m. daily. As of December 2014, approximately 1.25 of the Paseo had been constructed and were open to the public. Currently, the Paseo dead ends below El Morro; pedestrians must backtrack in order to exit the walkway at the San Juan Gate. When fully completed, the walkway will extend approximately three miles from the San Juan Gate to a point past San Cristobal, near the Capitol building.

The Paseo del Morro is being built in stages, with the next phase due to extend the walkway from El Morro to the historic cemetery in summer 2015. Park management are targeting 2017 as the completion date for the portions of the walkway to be built on NPS-owned land. Segments of the Paseo are slated to be constructed on non-NPS land; the park is working with the Commonwealth and Municipal governments to develop plans to complete those segments.

San Juan NHS is considering adding benches and exercise equipment at various points along the

Paseo to enhance visitor experience.



Clockwise from top left: Waysides provide interpretation along the Paseo del Morro; a view of the newest section of the Paseo, with the redesigned light posts; pedestrians navigate a narrow sidewalk in Old San Juan, adjacent to San Cristobal; the Paseo passes under an historic El Morro guard tower.

In addition to the paths and walkways located within the fortifications themselves, the park has a few other pedestrian facilities that are important links in the park transportation system. These include a walkway adjacent to the El Morro entrance road that provides pedestrian access to El Morro, and a sidewalk on the north side of Calle Norzagaray that connects El Morro and San Cristobal.

Park visitors also use the network of sidewalks in Old San Juan to access various parts of the park. In general, these sidewalks tend to be very narrow, uneven, and congested. A new municipal paved multiuse trail is under construction along Avenida Luis Munoz Rivera, and will connect Old San Juan with the upscale commercial center of Condado to the east.

On one Saturday morning each month, the Municipality of San Juan shuts down all of the streets in Old San Juan to accommodate pedestrians and bicyclists.

### **ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)**

The centerpiece of the San Juan NHS transportation system is the tram service, which launched in 2007. The tram route carries visitors between El Morro, San Cristobal, and various locations in Old San Juan. The service operates between 9 a.m. and 6 p.m. seven days a week, year-round. There is no fee to ride the tram.

The park owns five two-car trams, but is currently running only two trams due to a driver shortage. Each tram has a capacity of 45 passengers. The vehicles run on diesel fuel.

The tram currently operates on a 3.8-mile loop, which takes approximately 30 minutes to complete. The park plans to expand the tram route in 2015; the expansion would add three stops at the eastern end of Isleta de San Juan—for a total of 23 stops—and would lengthen the round-trip travel time by approximately 15 minutes. The park has created a new brochure to market the expanded service.

The NPS tram has an annual ridership of approximately 560,000. Ridership figures are tracked manually, based on a daily head count submitted by each tram driver.

The vast majority of the most pressing transportation needs identified by park staff involved the tram service, including: hiring additional drivers; getting the route extension in place; replacing tram vehicles; and replacing signage at tram stops located within NPS jurisdiction. Park management also expressed a desire for better tram data, so that they can better understand who rides the tram and determine whether tram usage matches high season visitation patterns.

The park also owns a dock at El Manueto.

**Figure 2: Map of Existing and Proposed NPS Tram Service Area**



## **Funding and Partnerships**

Due to the fact that park visitors need to use non-NPS transportation facilities to access San Juan NHS and move between different sites within the park, park management must work closely with the Commonwealth and Municipal governments in an effort to keep both the NPS and non-NPS transportation systems in good working order. Maintaining these relationships requires a significant time investment by park management, and at times can be contentious, depending on the political situation in the mayor's and governor's offices. Park staff reported that, currently, the working relationship between the park and the Commonwealth and Municipal governments is relatively contentious and unproductive.

Further complicating these relationships are complex jurisdictional issues related to certain transportation assets. For example, the NPS and the Commonwealth of Puerto Rico each own a portion of Calle Norzagaray, which borders the park on the north side of Old San Juan. A 1976 cooperative agreement states that the municipality owns San Augustin Road near San Juan Gate, but the NPS has jurisdiction over the road. Park management expressed interest in working out a land swap with the municipality that would straighten out some of the ownership lines and reduce confusion and conflict over jurisdiction of certain land parcels and transportation assets. Such a swap appears unlikely to happen during the current mayor's and governor's tenure.

### **PARKING**

San Juan NHS has an agreement with the governor's office to allow Commonwealth police officers who work at the governor's mansion to park their private vehicles on NPS property along San Augustin Road, which provides access to the park maintenance area. The park provides 32 spaces for this purpose; however, police officers sometimes park their vehicles in the roadway for extended periods of time, and in doing so block park maintenance vehicles' access. Park management has sent a letter to the governor's office requesting that they adhere to the parking agreement and keep the roadway clear for maintenance vehicles.

Park management has a medium- to long-term vision of building a visitor parking lot just east of Old San Juan, and providing shuttle service to the park. The NPS is also hoping to acquire land from the Commonwealth to add bus parking at the east end of the park, along Avenida Luis Munoz Rivera, in conjunction with a plan to create a new park entrance. The park had worked with the previous Municipal administration to develop preliminary plans for the land acquisition; however, those efforts have stalled under the new administration, which has shown no interest in working with the park on the matter.

### **PEDESTRIAN FACILITIES**

According to an agreement between the NPS and the Commonwealth, the Commonwealth is charged with providing security and maintenance on Paseo del Morro. The Commonwealth has a contract with a third-party firm to provide those services; however, according to park staff, the contractor does very little to fulfill its obligations under this contract, and as a result the park performs most of the Paseo maintenance itself. For instance, many of the original light fixtures along Paseo del Morro are failing due to design features that could not withstand the salty and moist environment (park staff noted that the NPS was not involved in the original Paseo lighting design). Due to inaction by the Commonwealth's contractor, the park has decided to use its own maintenance staff to replace the lighting along the Paseo.

San Juan NHS will need to work with the Commonwealth and Municipal governments to complete the portions of the Paseo del Morro that are not located on NPS property. The park does not anticipate receiving much, if any, financial support from local governments, and intends to seek Rivers, Trails and Conservation Assistance Program funding and Public Land Corps funding for those sections of the Paseo.

Park management expressed frustration with the San Juan mayor's office, which has repeatedly told the park that they have no money to contribute toward the construction of the Paseo del Morro, but was able to allocate \$28 million for the multiuse trail. Furthermore, construction of the multiuse trail has complicated the implementation of new tram stops, as it has made multiple tram stops inaccessible to tram riders. Park staff reported that they have received no communication from municipal officials about the trail construction.

## ATS

San Juan NHS purchased three two-car trams with ATS funding prior to launching the tram service in 2007. The park reconstructed the access road to El Morro ahead of implementing the tram service, which allowed for the placement of a tram stop just outside the El Morro entrance. In 2012, the park used ATS funding to replace the three trams and purchase two additional trams.



Left: An NPS tram travels along the entrance road to El Morro.  
Right: Construction of a Municipal multi-use path inhibits access to an NPS tram stop.

Tram operations cost the park approximately \$20,000 annually. While there is no charge to ride the tram, park management placed donation boxes on board the trams in 2013, which generated approximately \$25,000 in donations over the following 12 months. Those funds were used to pay for a brochure, driver overtime, and light vehicle maintenance.

San Juan NHS relies on a unique three-party agreement for the funding, operation, and maintenance of its tram system. Under the agreement, the NPS is responsible for purchasing the vehicles, storing them, and performing light maintenance; CODEVISA, a quasi-governmental agency whose primary mission is cultural promotions and event management in support of tourism, provides the tram drivers; and the Municipality of San Juan is responsible for heavy maintenance on the vehicles.

In addition to the park tram, CODEVISA operates two of its own tram routes in Old San Juan, and rotates its drivers between the park route and its own routes. CODEVISA submits report on tram operations, including ridership data, to the park on a quarterly basis.

As it pertains to the tram agreement, park management characterized their current relationship with the Municipality as a “constant battle.” The park often encounters pushback from the Municipality over maintenance needs and costs, and disagreements between the two parties can lead to maintenance delays. If those delays last for an extended period of time, the park usually simply covers the cost of the maintenance rather than continue to negotiate with the municipality. Park staff also expressed frustration over a lack of communication from the municipality on road closures in Old San Juan, which often occur with little advance notice. Park management regularly attend Municipal planning meetings for Old San Juan events, which have a significant impact on

tram operations, and stress the need to avoid road closures on tram routes in order to efficiently move people around the city.

As with other aspects of the park's relationship with the municipal government, the political affiliation of the administration in power has a significant impact on the municipality's responsiveness to the park's maintenance requests. In 2011, the park superintendent made a presentation to municipal leaders about the economic benefits of the park; he reported that, while municipal and Commonwealth leaders understand those benefits, their actions don't always reflect such an understanding because "politics overrides everything."

Park management reported that they have a good relationship with Tram International, the firm that manufactured the trams. Tram International has helped the park work with the municipality to determine what is covered under the tram warranty.

## Sustainable Operations

### Environmental Sustainability

San Juan NHS is undertaking multiple efforts that demonstrate the park's commitment to environmental sustainability. The park is planning to do a wind study for new sections of the Paseo del Morro to determine if they can generate enough wind energy to power all of the lighting on the Paseo. The park also has taken sea level rise into account in the design of the Paso.

The park is exploring options for converting its trams to biodiesel, which is currently infeasible due to a lack of nearby fueling stations. The park is considering applying for ATS funds to install a biodiesel station closer to Old San Juan.

San Juan NHS recently started the process of attaining Climate Friendly Park designation.

### Financial Sustainability

#### FUNDING AND FINANCIAL CONDITIONS

Park staff reported that the park is quite adept at securing available funding. Despite being a relatively small park, San Juan NHS was third highest recipient of repair/rehabilitation funding in the Southeast Region in FY 2014.

The park traditionally has not received much cyclic money, although that amount has increased in recent years. San Juan NHS received approximately \$1 million in cyclic funding in FY 2014.

#### STAFFING

The park's greatest staffing needs are related to tram drivers. As of November 2014, a driver shortage had limited San Juan NHS to running only two of its five trams for an extended period of time. During the Focus Park visit, park staff were optimistic that the driver shortage would be resolved in the very near future, and that the park would soon begin running four trams simultaneously.

According to the agreement between the NPS and CODEVISA, all tram drivers are required to be bilingual. In reality, relatively few drivers meet that requirement. Park staff stated that, with English speakers in high demand in Puerto Rico's tourism economy, CODEVISA has difficulty finding bilingual candidates willing to work for minimum wage. The park is considering using donations to provide a stipend for bilingual drivers in an effort to attract more qualified candidates. The park is also considering hiring a dedicated tram mechanic as a term position in an effort to reduce its reliance on the Municipality of San Juan for maintenance.

Tram drivers receive overtime pay for special events, during which trams run for extended hours.

The park relies heavily on its maintenance staff for improvements to transportation-related infrastructure, including the Paseo del Morro. Park management prefers to do maintenance and improvement jobs using in-house staff whenever possible due to cost considerations. The number of maintenance employees varies depending on current projects, and can range from 35 FTEs to more than 100 FTEs. The park has been without a Facilities Manager for two years, which has impacted the maintenance staff's capacity and which park management identified as one of its primary staffing needs.

## Safety

One of the park's primary safety issues involves pedestrian-vehicle conflicts in the San Cristobal parking lot loop. Because it is the main drop-off location for tour groups arriving to San Cristobal via bus or van, the parking lot loop features relatively high volumes of heavy vehicle traffic, as well as private vehicles looking for parking. There is a paved sidewalk on the left side of the parking lot that provides access to the San Cristobal Visitor Center; however, pedestrians often walk in the roadway despite posted signs directing them to use the sidewalk. Conflicts are exacerbated by the fact that visitors arriving by bus or van must walk into the parking lot loop roadway for at least some period of time regardless of which side of the road the buses discharge their passengers: if a bus parks and unloads on the right side, visitors must cross the loop to reach the sidewalk, and if a bus parks and unloads on the left side, visitors still must disembark through the right-side doors and into the roadway to reach the sidewalk. Park management's long-term plan is to eliminate parking and bus drop off from the San Cristobal loop, and establish a new drop-off location at the east end of the park.

The park plans to redesign the entrance road to El Morro to separate pedestrian and tram traffic. There is currently a paved walkway adjacent to the roadway, but the pavement is contiguous and the sidewalk is not clearly delineated from the roadway. As a result, many pedestrians treat the entire width of pavement—both the roadway and sidewalk—as a pedestrian walkway, which leads to conflicts with trams attempting to reach the tram stop at the entrance to El Morro.



Pedestrians walk in the roadway on the entrance road to El Morro.

The park is also working to eliminate issues involving tour buses going the wrong way down the one-way section of Calle Norzagaray in front of El Morro, which can lead to both safety concerns and congestion on that portion of the roadway. The park would like to address this issue by widening the one-way section of Calle Norzagaray and opening it to two-way traffic. Doing so requires working with the municipal government, as both the NPS and the Municipality of San Juan have jurisdiction over portions of the roadway. The park made significant progress in this regard with the previous municipal administration, with the municipality providing some preliminary design assistance and the NPS committing to paying for construction; however, these efforts have stalled under the current municipal administration.

Park staff reported a safety concern with the open-air tram involving passengers failing to wait for the tram to come to a full stop before disembarking. According to park staff, there were a handful of incidents in which passengers exiting a moving tram had suffered minor injuries.

## User Experience, Mobility, and Access

### Visitation

San Juan NHS welcomes approximately 1.3 million visitors annually. Park staff estimate that 80 percent of those visitors are made up by cruise ship passengers. The park experiences its highest visitation between November and May, which corresponds with high season for tourism in Puerto Rico. Summer months see a decrease in cruise ships, but an uptick in local visitation. October is the park's slowest month.

During peak season between November and May, park visitation is heavily impacted by the number of cruise ships docked in San Juan. The cruise ship port can accommodate up to seven ships simultaneously; with most ships capable of carrying between 4,000 and 5,000 passengers, the park can receive up to 30,000 visitors from cruise ships on peak days. The park anticipates that visitation from cruise ship passengers will increase in the next few years, as the Municipality of San Juan recently extended one of its docks to accommodate the new Quantum class cruise ship, one of the largest in the world.

San Juan NHS works closely with the cruise ship operators in promoting the park to passengers and providing passengers with advance information about the park. Many tour packages offered by the cruise ships feature the park, and operators also show an NPS promotional video on board the ships.

Locals and tourists use San Juan NHS differently. San Cristobal is more popular with tourists, and is busiest during the week, while El Morro is busier on the weekends, when many locals come to visit the fort and picnic on the lawn. A majority of visitors to San Cristobal enter through the Visitor Center on the lower level, adjacent to the tour bus drop-off loop.

San Juan NHS charges a \$5 admission fee for visitors aged 16 and over to enter San Cristobal and El Morro. Children under the age of 16 are admitted free of charge. Fee stations are located in both El Morro and San Cristobal, and the admission fee covers visits to all areas of the park.

The park hosts a large number of school groups, for whom the park entrance fee is waived. The Discovery Center at San Juan NHS, which was built using a combination of entrance fees and funding from the park's Friends group, provides educational programming for school-aged children. Park staff reported that many school groups do not plan well for their visits, and as a result they are often unfamiliar with the fee waiver, the park's chaperoning rules, and the education opportunities available through the Discovery Center. One of the superintendent's goals for 2015 is to increase awareness in local schools about advance planning for park visits.

Visitors to San Juan NHS can schedule Ranger-led tours through the park. Taxi drivers also can obtain permits, with requisite level of training from NPS staff, to lead tours. Park staff continually struggle with the issue of non-permitted taxi drivers giving tours. Rangers will halt this practice when they see it, but the park does not have enough personnel to perform widespread enforcement.

### Mobility and Visitor Experience

The San Juan NHS tram is a critical component to mobility in the park and in Old San Juan. Due to a driver shortage that has limited the park to operating only two of its five trams at any given time, the park is experiencing overcrowding and long wait times on its tram route. Park staff reported waits of up to 45 minutes during peak periods.

Trams are often overcrowded on specific segments of the loop, such as between the cruise ship piers and El Morro, and nearly empty on other segments. In certain locations such as the entrance to San Cristobal, wait times could be greatly reduced if visitors were to board trams traveling in the opposite direction. Doing so would entail additional travel time, but would assure them a seat. Park staff have encouraged tram drivers to share this advice with visitors, with limited success.



Clockwise from top left: Visitors waiting to board an NPS tram are unable to do so due to a lack of available seats; a bus and municipal tram block the entrance to the San Cristobal drop-off loop; cruise ships docked in San Juan; shuttle buses parked in the San Cristobal loop.

The park tram does not currently feature interpretation on board, although park management is considering putting rangers on trams to provide interpretation during special events, when trams run on an extended schedule.

The tram receives heavy use from both tourists and locals. Park management reported that they initially were surprised by local residents' preference for the open-air NPS trams to the closed air-conditioned vehicles used on other non-NPS routes in Old San Juan.

Old San Juan frequently experiences high levels of congestion, which can severely hamper mobility for park visitors. Private vehicles, taxis often block roads, and Municipal police frequently block roads, thereby cutting off access to trams, with little or no advance notice.

During peak periods—such as when the maximum number of cruise ships are in port or when large numbers of school groups are visiting the fort—the park needs to accommodate up to 30 tour buses and up to 20 school buses at one time. The Visitor Center loop at San Cristobal, which serves as the primary drop-off location for tour buses, becomes congested during peak periods, as shuttle buses and private vehicles compete for scarce space. Shuttle buses often idle in areas not designated for bus parking.

The San Cristobal loop requires continuous monitoring to enforce parking, standing, and idling restrictions, and the park tries have a ranger assigned to the loop throughout the day. Park management would like to eliminate parking and tour bus drop-off areas in the San Cristobal loop, and instead send NPS trams through the loop.

Park management recently addressed an issue with Municipal trams and buses blocking the entrance to the San Cristobal loop by moving the bus stop to the far side of lot entrance; however, some trams and buses still stop at the near side of the entrance despite the relocation of the stop.

Events in Old San Juan have a significant impact on both park visitation and on mobility in and around the park. The San Sebastian Festival in January brings up to 100,000 people to Old San Juan, and involves numerous street closures that impact the park tram route. The park sometimes will bring in additional law enforcement staff from other parks to assist during major events. Park staff also have difficulty getting to work during major events.

The park grounds themselves also become congested during events and when large numbers of school groups are visiting.

## **Multimodal Connections**

San Juan NHS can be reached by numerous modes, including tram, ferry, private vehicle, taxi, walking and bicycling. Three tram routes, including the NPS tram and two routes operated by CODEVISA, provide access to the park and to various sites around Old San Juan. Once implemented, the expanded NPS tram service will provide service to the eastern end of Isleta de San Juan. The Municipality of San Juan had developed plans for a direct transit connection between Old San Juan and other parts of the city, but those service expansion plans have been shelved by the current administration. Currently, transit service from other areas of San Juan terminates at the Covadonga bus terminal located approximately a half-mile east of Old San Juan.

Ferry service is available near the cruise ship piers, and provides a connection to the south side of San Juan Bay and Tren Urbano, a rail link to other locations in and beyond San Juan.

Water taxi service is scheduled to begin in 2015, and will run between the San Juan Gate and El Manueto. Park management has been working with a concessionaire to establish a commercial use permit for the water taxi service, which will include on-board interpretation. During the Focus Park visit, park management was excited about the potential for increased visitation at El Manueto and for cross-marketing between the park and the Bacardi distillery, a very popular tourist destination located near El Manueto.

The Paseo de la Princesa is a Commonwealth-owned pedestrian facility that connects to the Paseo del Morro at the San Juan Gate. Paseo de la Princesa provides a key pedestrian link between the cruiseship piers and San Juan NHS.

## **Access for Underserved Populations**

The La Perla neighborhood of Old San Juan is located adjacent to the park between El Morro and San Cristobal, and is sandwiched between the historic wall and the Atlantic Ocean. La Perla is a relatively isolated and underserved neighborhood that is home to a number of low-income families. El Paseo Del Morro, when completed, will pass through this neighborhood. The park has worked closely with La Perla residents in its planning for the sections of El Paseo that will run through the neighborhood. As a result of these efforts, the park will construct two sets of stairways that will link La Perla to El Paseo and better connect the neighborhood to recreational opportunities in the park.

The park also performs an annual cleanup in La Perla as part of its volunteer cleanup program, which receives participation from the Boy Scouts and from local private schools.

## Resource Protection

### Historical and Cultural Assets

San Juan NHS preserves and interprets a variety of historical assets that are central to its mission and status as an historic monument, most notably the forts at El Morro and San Cristobal and the historic wall. The park's maintenance staff is known throughout the park service for its unique set of masonry skills, and the park often receives requests to help with preservation projects at other NPS park units. San Juan NHS trains all of its masons in-house, and also offers training at local universities. The park also runs a "Junior Masons" program through the Discovery Center to teach children about masonry and the importance of historical preservation.

San Juan NHS tries to keep historical and cultural preservation in mind in designing transportation projects. For instance, the park used to use asphalt for paving projects, but in recent years switched to concrete aggregate, which is more consistent with the character of the park and its fortifications. In the mid-1990s, in responding to a hurricane that damaged a parking lot at El Morro, the park decided not to rebuild the parking lot in order to enhance the historic character of El Morro. In planning and constructing the Paseo del Morro, the park has chosen an unobtrusive design that fits with the look and feel of the park's historic assets.

### Negative Resource Impacts

San Juan NHS faces a number of challenges in its efforts to preserve historical, cultural, and natural resources within the park. Primary among them is the impact of wave action on the historic fortifications. The park has used the construction of the Paseo del Morro as an opportunity to reinforce the riprap along the shoreline to better protect the fortifications. Landslides are another issue that the park is hoping to address through Paseo design and construction.

The park is home to a large number of iguanas, an invasive species that burrows into the limestone walls and has a destructive effect on the historic fortifications. Feral cats can be found throughout the park, and especially along the Paseo del Morro. While not destructive, the cats are a nuisance and have a negative impact on visitor experience.

# National Park Service Southeast Region Long Range Transportation Plan

## Focus Park Visit Summary



## Stones River National Battlefield

September 2014



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## Introduction

### Background

The purpose of this report is to document the findings from the site visit conducted at Stones River National Battlefield in conjunction with the development of the National Park Service Southeast Region (SER) Long Range Transportation Plan (LRTP).

As part of the SER LRTP effort, SER staff have identified nine Focus Park units that are representative of the broad range of units in the region. The SER LRTP core project team will visit each of these Focus Parks over the course of several months at the start of the LRTP effort to meet with park staff and learn more about the transportation systems at each park unit. The Focus Park visits are intended to provide the core project team with a better understanding of both shared and unique unit level transportation conditions, needs and opportunities, and strategies. Because the core project team cannot visit all 66 park units within the Southeast Region, each focus park will serve as representative of other parks in the region with similar missions, settings, and transportation assets and challenges. The lessons learned from the Focus Park visits will inform multiple subsequent processes and products, including the park unit transportation survey, the baseline and future conditions analyses, and the needs assessment.

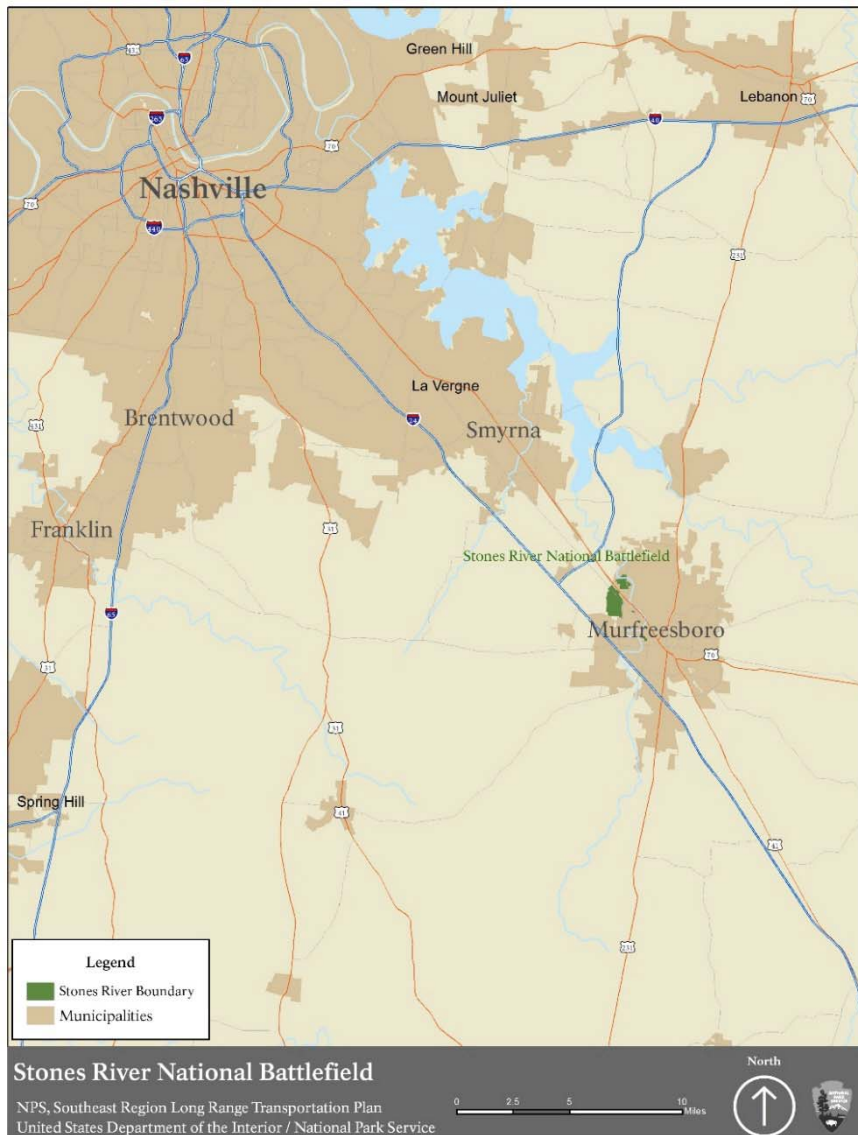
The fifth of the nine Focus Park visits took place at Stones River National Battlefield (NB) on September 23-24, 2014. The visit included conversations with park staff as well as a park tour and field review to observe firsthand specific transportation assets and conditions. The site visit was attended by the following individuals:

- Gayle Hazelwood, Superintendent, Stones River NB
- Gib Backlund, Chief of Operations, Stones River NB
- Chip Bradley, Maintenance, Stones River NB
- Teresa Cantrell, National Park Service Southeast Region
- Nat Grier, VHB
- Corey Pitts, VHB

### Park Overview

Stones River National Battlefield is located adjacent to Murfreesboro, Tennessee, about 30 miles southeast of Nashville (Figure 1). The park, which spans roughly 700 acres, memorializes the Battle of Stones River fought at the turn of 1863. There are six distinct units encompassing portions of the original battlefield, headquarters sites, and the subsequently constructed Fortress Rosecrans.

Figure 1: Regional Context Map



Source: NPS and ESRI

The Park contains Stones River National Cemetery, which was established in 1862. The Park was established in 1927, under the secretary of war. It was transferred to the National Park Service in 1933. According to the original enabling legislation, the park was created “with a view of preserving and marking [the] field for historical and professional military study.”<sup>1</sup> The park preserves and interprets a variety of historical and cultural features that support this mission, including fortifications, cannons, memorials, historic structures, and historic transportation corridors. Access to these historical and cultural offerings is provided through paved roadways and a trail system. See Figure 2 for a park map.

While the park’s primary focus is on historical and cultural preservation and interpretation, it also serves as a popular recreational destination for local and regional residents. There are many

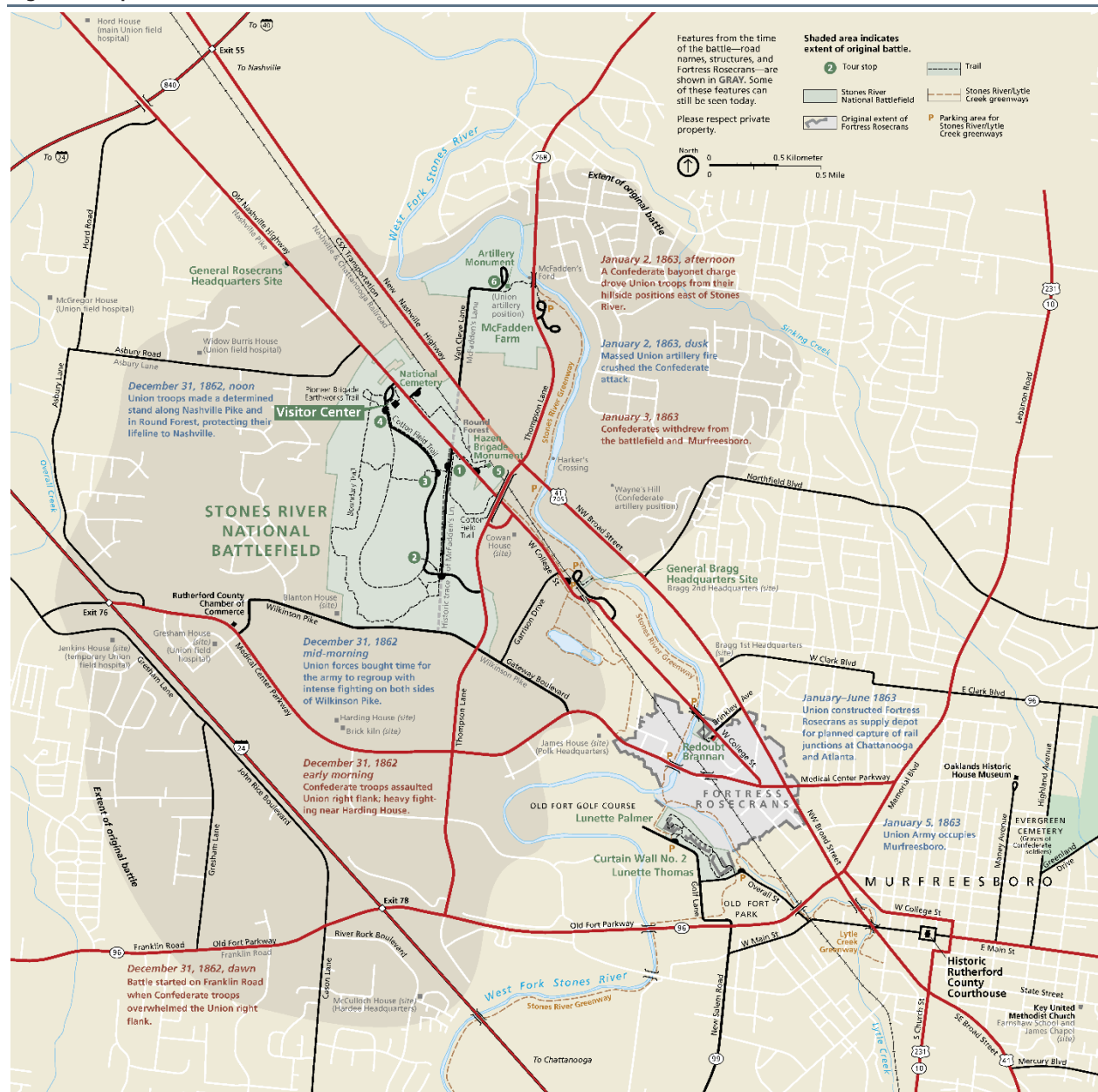
<sup>1</sup> 44 Stat 1399 as reproduced in the 1998 General Management Plan

visitors who come to walk, run, or bike along its paths and trails.

Due to its location in an increasingly urbanized area, Stones River NB also experiences significant levels of non-recreational visitation. The park is bisected and bounded by multiple highways that serve as major commuter corridors and are heavily congested during weekday peak hours. This congestion results in adverse impacts to access and mobility and visitor experience in and around the park.

The following sections of the report provide further details on the park’s transportation conditions, challenges, and needs based on the conversations with park staff and field observations gleaned during the Focus Park visit.

**Figure 2: Map of Stones River National Battlefield**



Source: NPS

## Asset Management

### Transportation Assets

#### ROADS

There are just over 2 miles of paved roads maintained by the park service. As part of the management plan, the park has closed much of the historic driving loop though has plans to expand the driving loop in the future.

The primary access road for the park is Old Nashville Highway. In 2011, the park constructed a new entrance off of Thompson Lane to respond to changing development patterns and improve ease of access to the park. Old Nashville Highway—which becomes West College Street within the City—provides access to four of the six park units. Access to McFadden Farm is via Nashville Highway (US 41); Lunette Palmer is connected to the City's Old Fort Park and accessed via Old Fort Parkway. All of these roads are key elements of the regional road network and experience high volumes and often high speeds. Most are congested in the peak hours.

A CSX rail line cuts through the park. While early in the park's history (and even prior to its designation as a park) the rail line played an important role in providing passenger access, today it is a freight line and serves to bisect the park. While the park contains much of the historic McFadden's Lane, this crossing has been closed for safety reasons and visitors must now drive, utilizing the Thompson Lane rail overpass.

Although there are long-term plans to update the driving tour, there are no substantial proposed roadway improvements within the park. There are a number of projects in the immediate vicinity including:

- ❶ Widening of Wilkinson Pike to three lanes with sidewalk and curb on the south side.
- ❷ Widening of Thompson Lane to four lanes, north of US 41. This will likely impact the City park opposite the McFadden Farm, but there is also the possibility to construct new access to McFadden Farm as part of this project.
- ❸ The County's LRTP calls for widening of Old Nashville Pike. While it is unlikely that would result in taking of land from the park (it might not be widened through the park), it would increase vehicle traffic and could increase issues with speeding.

#### PARKING

Stones River NB has one primary parking lot for each of the six sections. Additionally, there are small pull-out lots along the auto tour route. All parking lots in the park are free of charge. Anecdotally, there are few parking problems. Parking at the Visitor Center can fill up, particularly midday and on weekends during the summer. There is also a small lot at the intersection of Van Cleve Lane and Park Road that is popular with recreational users and regularly fills. The park added two gravel spaces and is considering adding a couple more to accommodate this demand. Staff noted that for large events, such as Memorial Day, demand far outstrips supply, but they are able to mow fields to serve as overflow visitor parking. They feel long-term demand will require further expansion of the existing parking. Parking was not considered an issue at the McFadden Farm site.



Visitor Center parking lot

### **PEDESTRIAN AND BICYCLE FACILITIES**

Stones River NB has nearly 7 miles of trails for hiking and bicycling. The park also connects to the City of Murfreesboro's Stones River Greenway System at many locations. The greenway provides direct access to all areas of the park except the General Rosecrans Headquarters Site. The City just completed its 25-year plan for Greenways and Blueways and there is potential for additional and enhanced connections between the park and the network.



Left: Paved multi-use path; Right: Many use the park for recreation.

### **ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)**

The park does not currently provide any alternative transportation options. Commuter buses operate on US 41. There is no good local transit access to the park, though they are working with the City on the possibility of one or more stops.

## Funding and Partnerships

### ROADS

As the road network is relatively small, it is not the primary focus of operations and maintenance in the park. Additionally, much of the roads are in relatively good condition as a result of recent upgrades to the auto trail.

One of the primary challenges for the park has been wayfinding and signage to the park. While this continues to be a concern, they have a long-established relationship with the County and Convention and Visitors Bureau which has resulted in the inclusion of Stones River NB on the recently installed wayfinding signs (over a 10-year process). Coupled with the new entrance, complaints of inability to find the park have dropped noticeably. There is still concern, though, that wayfinding and signage to the outlying sites is difficult.

The park has also worked with the Tennessee Department of Tourism to help promote the park. It is a stop along the Jack Trail, a driving tourism trail covering central Tennessee.

### PARKING

Parking for many of the outlying areas are joint with City parks so the City is responsible for maintenance of these parking areas.

The park has developed a strong relationship with the County jail. Inmates provide a wide range of maintenance support throughout the park, including grounds maintenance in parking areas and visitor centers.

### PEDESTRIAN, BICYCLE, AND EQUESTRIAN FACILITIES

The park has a mix of paved and unpaved trails. As they are generally flat, and many of the paved trails recently repaved, they have lower maintenance requirements than might be experienced at other parks.

As noted above, the City's Greenway system connects to nearly all sections of the park. The Park has worked to strengthen these connections and the City views the park as a recreational asset.



County wayfinding sign directing traffic to Stones River NB

## Sustainable Operations

### Environmental Sustainability

The park's core mission revolves around preservation of the battlefield and it sees protecting the surrounding environment as a central component of that mission. Invasive species are a primary concern of the park and they have worked hard to control and, if possible, eliminate invasive species. They have also worked with the City to understand and catalog invasive species in its park, particularly those contiguous to Stones River NB, but have found that the City has even fewer resources to control.

The park has invested in alternative fuel vehicles. They have two E85 vehicles which they will fill with E85 when possible but there is only one nearby source. They normally use B20 for diesel vehicles. While they use pure gasoline for equipment, they are exploring the possibility of using E10.

### Financial Sustainability

#### FUNDING

Stones River NB has benefited from a number of repair and upgrade projects in recent years so much of the transportation infrastructure is in good condition. They did note that completion of the tour route will be roughly \$10 million, an amount they are unsure how and when will be funded.

The park is also working to reinvigorate its Friends group. They hope that increased activity and donations can help offset costs and provide more funding flexibility.

#### STAFFING

Staffing is a challenge for the park. Like most parks, current full-time staff are fewer than where they "should be" for reasons of retirement, attrition, and sequestration. As noted above, the park makes regular use of local inmates to assist with maintenance. They noted that actually getting work crews from the jail is not the issue—it is finding park staff to supervise them and ensure that they are put to best use.

## Safety

### Intermodal Conflicts

Park staff noted that accidents within the park are extremely rare. The biggest issue is on Old Nashville Highway, which is a county road. There is a flashing beacon at the crossing between the Visitor Center and the cemetery; the beacon is new within the past five years and traffic generally seems to yield to pedestrians. The primary issue is actually that motorists, with some regularity, lose control and hit the cemetery wall, resulting in expensive repairs.

Vehicle speeds within the park are generally low and pedestrians and bicycles are largely separated from vehicles.

As noted above, there are not good direct connections between the different sections of the park for pedestrians and bicyclists, although the Greenway System provides a high-quality connection that is generally grade separated from the surrounding road system. There are reports that some individuals will jump the fence along McFadden Lane/Van Cleve Lane to cross the railroad tracks rather than drive or use the Thompson Lane overpass. The park noted that they would like to improve this connection—all the way to the McFadden Farm—but there is no identified project to do so.



Left: Example of walking/bicycling path adjacent to roadway; Right: Flashing beacon at cemetery crossing

### Data Gaps

Park staff did not identify specific data gaps as hindering transportation operations or planning. They noted that while they have generally good visitation estimates for the main battlefield site, several of the outlying sites have no counters or other way to track usage.

## User Experience, Mobility, and Access

### Visitation

Recreational visitation at Stones River NB was reported at roughly 260,000 in 2013. While visitation has experienced a slow decline since the late 1990s, it has risen noticeably in the past two years near record level. These may be related to 150<sup>th</sup> anniversary events. This also coincides with the enhanced entry and continued development in the vicinity of the new entry. Non-recreational visitation is nominal.

Visitors are a mix of local visitors and those coming from greater distances. Anecdotally, they are seeing increased visitation from Nashville, as it is an easy day, or even part-day, trip. There is some international visitation, likely associated with the airport and the growing presence of automobile and other manufacturing headquarters.

### Mobility and Visitor Experience

Transportation plays a vital role in the visitor experience at Stones River NB. Most visitors arrive by personal vehicle. Signage and wayfinding—both to find the park and navigate within it—have improved dramatically in recent years, challenges traveling and navigating between sites remain.

Traffic on the surrounding roads does not have substantial impact on the battlefield proper, but it makes accessing many of the other sites difficult. McFadden Farm is a particular challenge, with limited signage directing visitors to the site. Egress from the site can be extremely challenging: while there is a signal not far to the south, which can assist in creating gaps, particularly for right-turning traffic, left turns remain challenging. There is no signal for 3.5 miles, resulting in minimal gaps, and traffic is often traveling at 45 mph or faster. Furthermore, the exit corresponds with a rail spur crossing US 41 making use of the median as refuge a challenge.

The multiple sites result in a separate challenge in that travelling between them interrupts the battlefield experience. The local street network makes access to Fortress Rosecrans difficult. Its distance from the Visitor Center and battlefield, and the adjacent development patterns all contribute to a feeling of disconnectedness of the sites. Although McFadden Farm is closer, it also suffers from a feeling of disconnectedness and discontinuity of experience. The challenging navigation coupled with the traversal of the commercial and industrial development detract from the experience, all the more notable because it is on the auto tour. The City has helped to minimize the visual intrusion by creating a Battlefield zoning overlay east of the battlefield which imposes a 35-foot height limit, but the hospital successfully argued for an exception (to build to 125 feet) so there is also risk to the primary battlefield.

### Multimodal Connections

As noted previously, the park has multiple connections to the City of Murfreesboro's Stones River Greenway System. There are bicycle lanes along Thompson Lane.

City of Murfreesboro operates a transit system referred to as the Rover. Two of its routes serve the hospital and Medical Center proximate to Thompson Lane though none of the service is directly adjacent—or otherwise within easy walking distance of—the park. The park has had discussions with the City about the possibility of installing a stop or creating a slight modification to a route to allow access to the Park.

### Mode of Access

Nearly all visitors to Stones River NB arrive by private vehicle. A small number may walk or bike in using adjacent streets or the Greenway System, while use of transit is scant. They are noting an increase in the number of tours and coach buses visiting the park. Proximity to Nashville and the airport makes it an easy trip. Staff anticipate a steady increase in tour visitation.

## Resource Protection

### Historical, Cultural, and Natural Assets

Stones River NB preserves and interprets a variety of historical and cultural assets related to its status as a battlefield and historic site. Among these are portions of Fortress Rosecrans, the largest enclosed earthwork built during the Civil War. These earthworks are the original fortifications built in 1863 after the battle, and have been preserved in relatively good condition over the 150 years since the battle. The park also features cannon emplacements, historical markers, monuments and memorials, and waysides.

The park continually seeks to strike a balance between providing safe and adequate access to these historical and cultural offerings while also ensuring that these assets are preserved and maintained for future enjoyment and appreciation.



Left: Cannon emplacements; Right: Stones River National Cemetery

### Negative Resource Impacts

Stones River NB faces a number of challenges in its efforts to preserve historical, cultural, and natural resources within the park. The park expects visitation to continue to grow and demand for recreational uses to increase. The park is one of a few, and among the largest, contiguous open spaces in the area. Accommodating this growth while preserving the historical, cultural, and natural landscapes will continue to be a challenge.

Invasive species continue to be a primary concern of the park. This is not expected to have a large direct impact on transportation assets, although as the park strengthens its connections to the Greenway, where the City has less focus on control of invasive species, there will be increased exposure. Climate change is contributing to changing species. There are armadillos in the park; while not a substantial concern at present, there is the possibility of future collision issues.

Air quality is an issue within the park. Regionally the area is non-attainment for ozone and they have measured elevated levels of ozone within the park. There is also concern that other pollutants, particularly as the area around the park has developed rapidly and continues to do so, will have detrimental impacts on the monuments. Staff also noted that Stones River is an impaired watershed so stormwater treatment is an issue. The park is connected to the City's stormwater system, though, so there is not an immediate concern.

Looking forward, the park is focused on night sky preservation and natural sounds. They are looking to provide light and sound buffers from the surrounding roads as well as consider the impact of roads within the park. This could include adoption of modified road surfaces or trail designs to preserve natural sounds and reduce vehicle noise.

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the science of insight

# NATIONAL PARK SERVICE SOUTHEAST REGION LONG- RANGE TRANSPORTATION PLAN: TRANSPORTATION SURVEY RESULTS

3.3.2015



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# NATIONAL PARK SERVICE SOUTHEAST REGION LONG-RANGE TRANSPORTATION PLAN: TRANSPORTATION SURVEY RESULTS

PREPARED FOR:  
VHB

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## 1.0 INTRODUCTION

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During November 2014 through January 2015, RSG worked in partnership with the National Park Service (NPS), Federal Highway Administration Eastern Federal Lands Highway Division (EFLHD), and VHB to administer a transportation-related survey to the superintendent at each park unit within the NPS Southeast Region (SER). The purpose of the survey was to collect information that will help the NPS develop a long-range transportation plan (LRTP) for the SER. In particular, the survey instrument was designed to collect information about transportation-related conditions, needs and issues, and effects on park resources and visitors' experiences in each park unit in the SER. This memo describes the methods used to design and administer the survey instrument, and presents tabular results of the survey. A copy of the survey instrument is included in Appendix A.

## 2.0 METHODS

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### 2.1 | SURVEY INSTRUMENT

The survey instrument was organized into six sections. The first section of the survey instrument, entitled “Unit Description,” includes questions concerning the type of area surrounding the park unit, transportation modes used to access and travel within the park unit, park staff perceptions of the condition of transportation components within the park unit, and the extent to which potential external pressures are a problem for the park unit.

The second section of the survey instrument, entitled “Visitation & Transportation-related Visitor Experiences,” includes questions concerning how park staff expect visitation to the park unit to change in the next 10 years and corresponding impacts on transportation needs in the park unit, and the extent to which various transportation-related issues negatively impact visitors’ experiences in the park unit.

The third section of the survey instrument, entitled “Visitor Information & Communications Technology,” includes a question about the adequacy of and importance to visitors of various transportation-related information sources.

The fourth section, entitled “Transportation Improvements & Funding,” includes questions about funding priority levels for potential transportation improvements for the park unit, the importance and quality of transportation-related data available to park staff, whether or not the park unit has completed a Self-Evaluation and Transition Plan, and whether or not the park unit has transportation-related partnerships with other agencies, organizations, and/or groups.

The fifth section of the survey instrument, entitled “Climate Change, Sustainability, & Livability,” includes questions about the vulnerability of the park unit’s transportation facilities and network to climate change impacts, and programs and actions planned or implemented by the park unit to address climate change, livability, and sustainability.

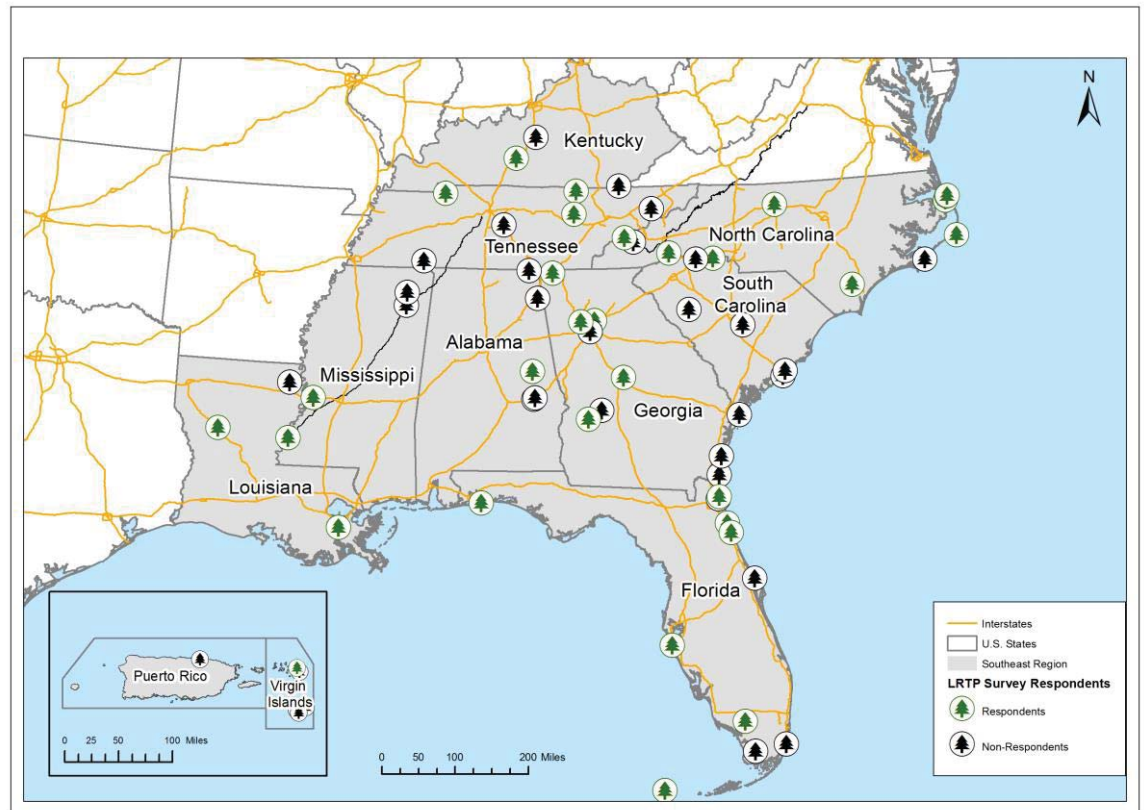
The sixth and last section of the survey instrument, entitled “Other Comments” includes a question that asks respondents to provide any other thoughts, concerns, issues, or challenges related to transportation within the park unit.

### 2.2 | SURVEY ADMINISTRATION

The population to which statistical generalization is intended for the transportation survey is park superintendents and supporting park staff at park units in the SER. The survey was e-mailed to the superintendent at each of the 67 park units within the SER by SER Office administrative staff during November 2014. A series of follow-up emails was sent to park superintendents in January 2015 to remind them about the survey and encourage those who had not yet completed and returned the survey instrument to do so.

A total of 27 responses was received, representing 31 of the 67 park units in the SER and resulting in a 46% response rate.<sup>1</sup> A complete list of SER park units that responded to the survey can be found in Appendix B. The map in Figure 1 displays all of the park units within the SER and indicates the park units from which a completed survey instrument was received. As denoted in the map, a completed survey instrument was received from at least one park unit within every state within the SER.

**FIGURE 1. MAP OF SER PARK UNITS AND PARK UNITS WITH COMPLETED SURVEY INSTRUMENTS**



## 2.3 | SURVEY LIMITATIONS

Like all surveys, this survey has several general limitations that should be considered when interpreting results, as follows:

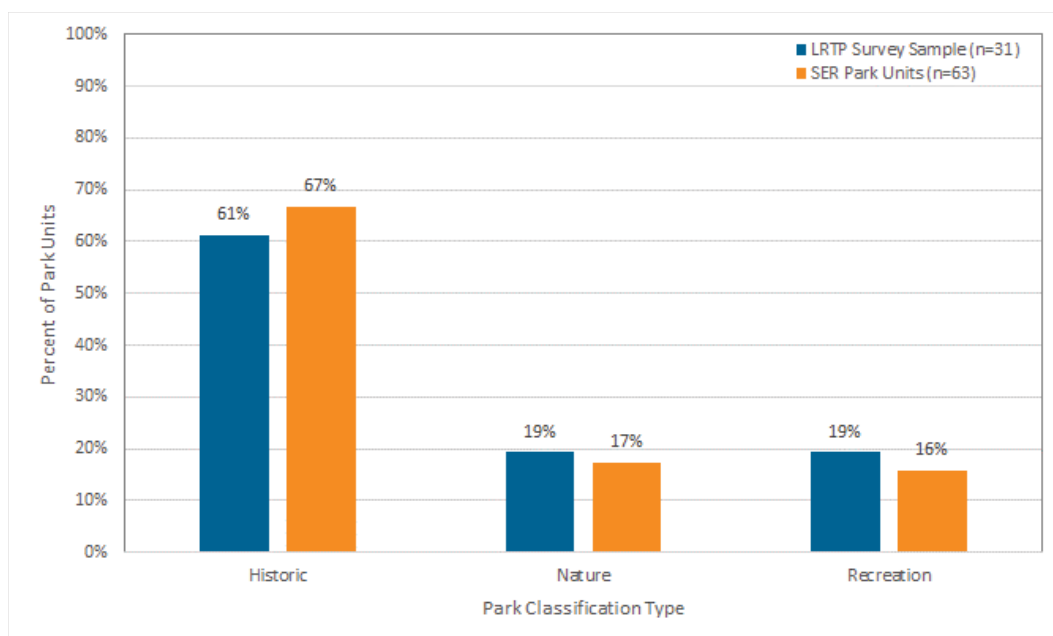
<sup>1</sup> One survey instrument was completed for the jointly administered but physically separated Castillo De San Marcos National Monument and Fort Matanzas National Monument unit; One survey instrument was completed for the jointly administered but physically separated Jean Lafitte National Historic Park and Preserve and New Orleans Jazz National Historic Park units; One survey instrument was completed for “the Outer Banks Group” which includes three separate and distinct park units: Cape Hatteras National Seashore, Fort Raleigh National Historic Site, and Wright Brothers National Memorial.

1. This was a self-administered survey, which may have been completed in its entirety by the superintendent of the park unit or with input from other park staff. Thus, the respondent universe may vary among park units.
2. The data reflect park staff perceptions of transportation-related conditions during the study period of November 2014 through January 2015. Thus, the results present a “snapshot-in-time.”

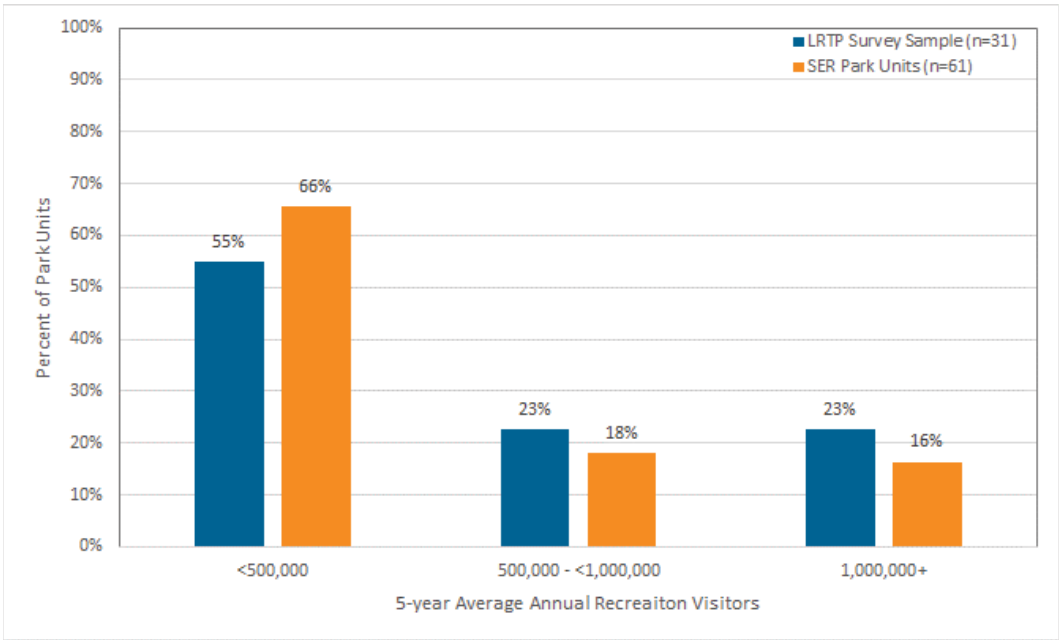
In addition, the sample size for this study is small ( $n=31$ ). The small sample size is due, in part, to the fact that there are only a total of 67 park units in the SER; thus, even with a 100% response rate, the study would have a relatively small sample size. While a 46% response rate in this study is within the range of what is typically considered an acceptable response rate for mail and email-based surveys, the overall sample size ( $n=31$ ) limits the statistical reliability of the results (this equates to being 95% confident that the survey findings will be accurate to within 18 percentage points).

While the overall sample size in the study is small, the distribution of park units in the survey sample is similar to that of SER park units generally, with respect to park type (Figure 2). However, the summary statistics in Figure 3 suggest SER park units with relatively low visitation may be slightly under-represented in the survey sample, and SER park units with relatively high visitation may be slightly over-represented in the survey sample. This and the other limitations noted should be considered when interpreting the results in this study.

**FIGURE 2. PARK UNIT TYPE – TRANSPORTATION SURVEY SAMPLE VERSUS ALL SER PARK UNITS**



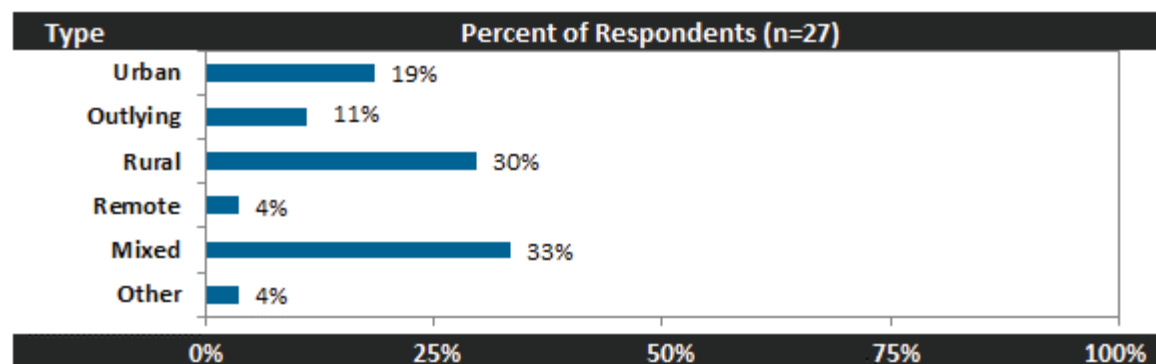
**FIGURE 3. 5-YEAR AVERAGE ANNUAL RECREATION VISITORS – TRANSPORTATION SURVEY SAMPLE VERSUS ALL SER PARK UNITS**



The remainder of this report includes graphical and tabular results of the transportation survey. Verbatim open-ended and/or “other” responses are listed below figures of responses, when questions included open-ended and/or “other” response options. Sample sizes (i.e., number of responding park units) for each question and item are reported in the figures and tables of results.

### 3.0 GRAPHICAL AND TABULAR SURVEY RESULTS

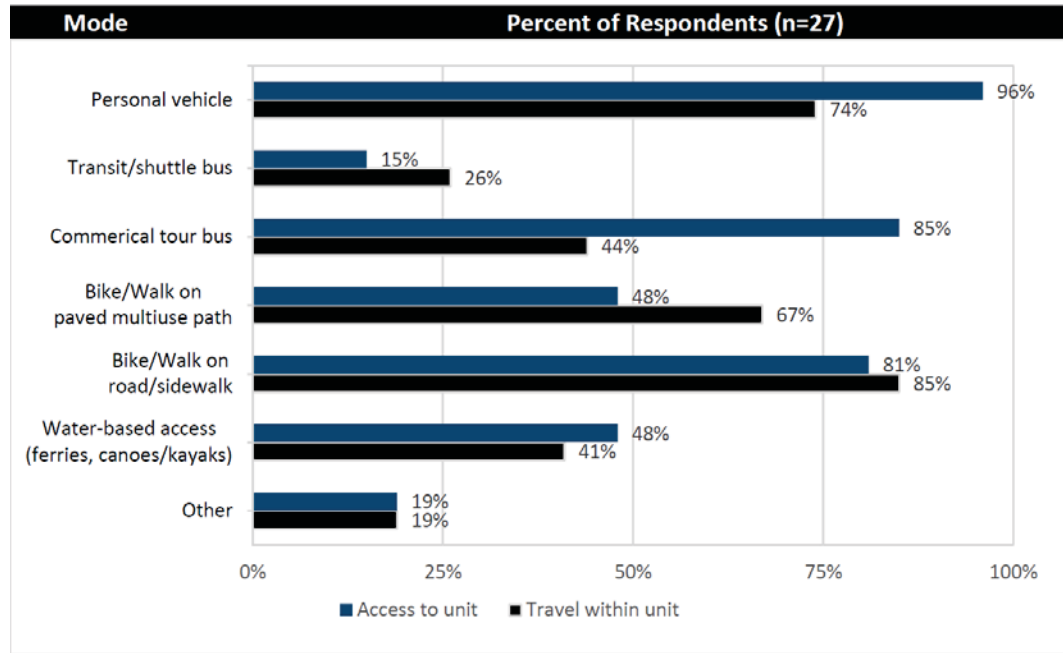
**FIGURE 4. HOW WOULD YOU BEST DESCRIBE THE SURROUNDING AREA IN WHICH YOUR UNIT IS SITUATED?**



**TABLE 1. LIST OF OTHER RESPONSES (VERBATIM SURVEY RESPONSES)**

Area	Unit
The Outer Banks Group consists of three park units (CAHA, FORA & WRBR) the surrounding areas range from Outlying to Remote	The Outer Banks Group (CAHA, FORA,WRBR)

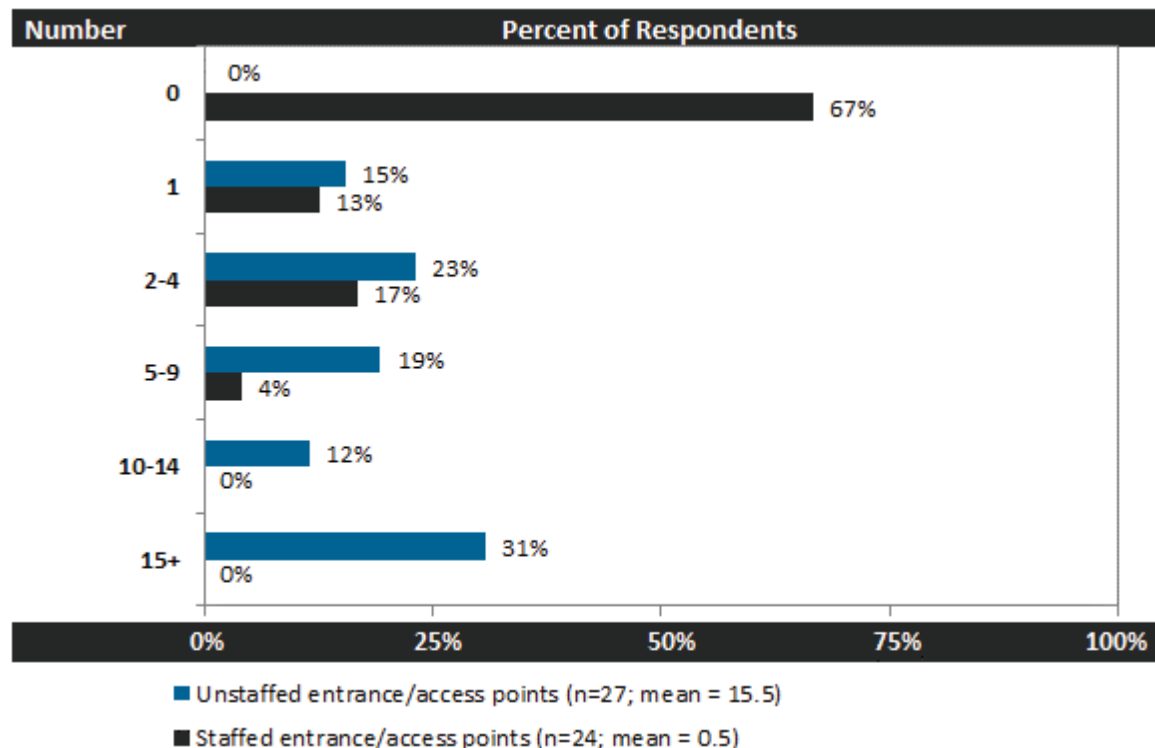
**FIGURE 1. WHAT MODES OF TRANSPORTATION DO VISITORS USE TO (A) ACCESS YOUR UNIT, AND (B) TRAVEL WITHIN YOUR UNIT?**



**TABLE 1. LIST OF OTHER MODES OF TRANSPORTATION VISITORS USE TO (A) ACCESS UNIT AND (B) TRAVEL WITHIN UNIT**

Mode	Unit	Access to unit	Travel within unit
Aircraft (The group has 3 airfields within the parks) & Water vessels	The Outer Banks Group (CAHA, FORA, WRBR)	X	
Seaplane	Dry Tortugas National Park	X	
Horse-drawn wagons	Obed Wild & Scenic River	X	
Horse-drawn wagons	Big South Fork National River and Recreation Area	X	X
Walk on unpaved trail	Virgin Islands National Park		X
Walk, Sam Shortline Train	Jimmy Carter NHS	X	X
Walk, work vehicles	Cane River Creole National Historic Park		X

**FIGURE 6. APPROXIMATELY HOW MANY STAFFED AND UNSTAFFED ENTRANCES/  
ACCESS POINTS TO YOUR UNIT ARE THERE?**

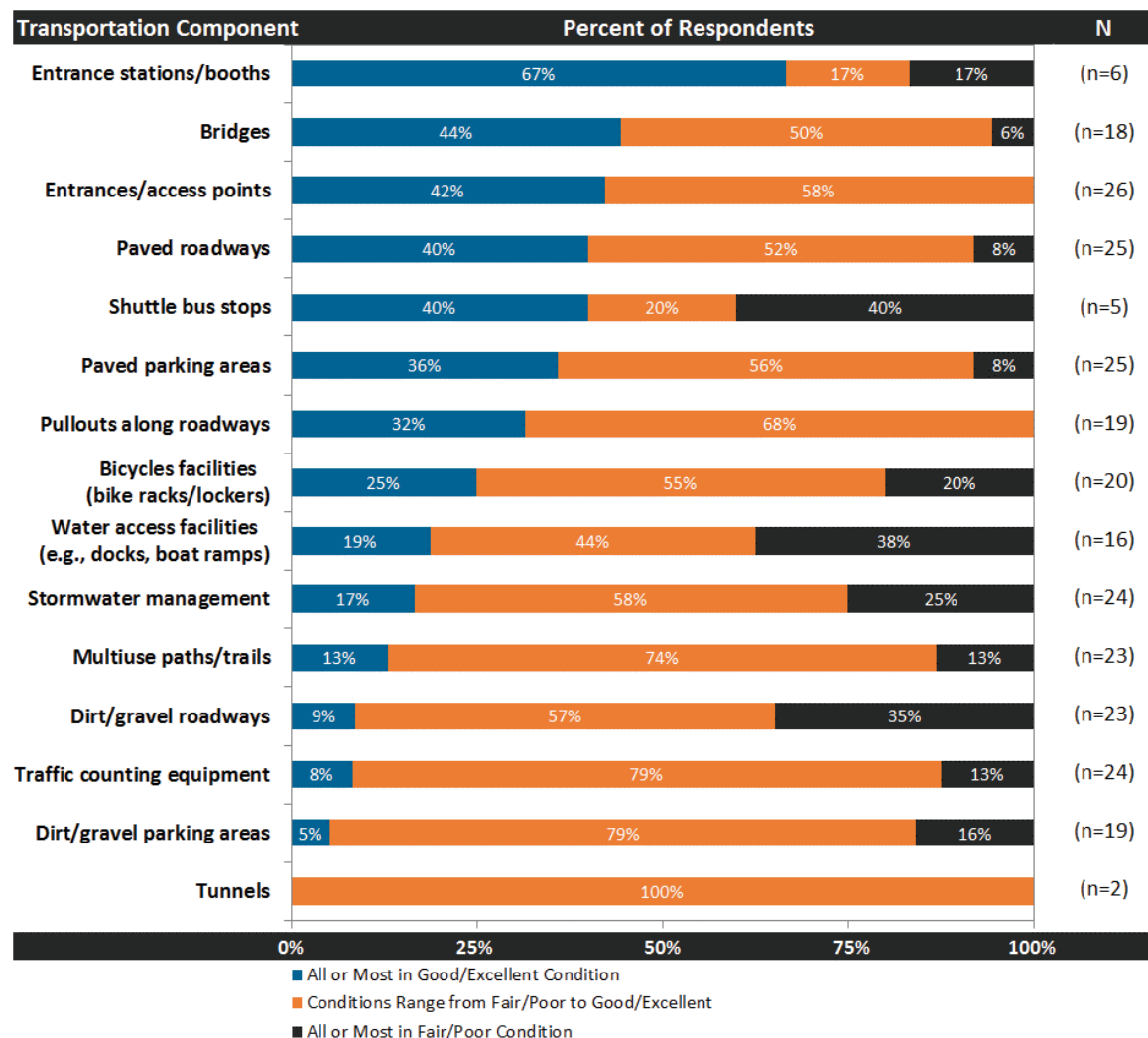


**TABLE 3. APPROXIMATELY HOW MANY STAFFED AND UNSTAFFED ENTRANCES/  
ACCESS POINTS TO YOUR UNIT ARE THERE?**

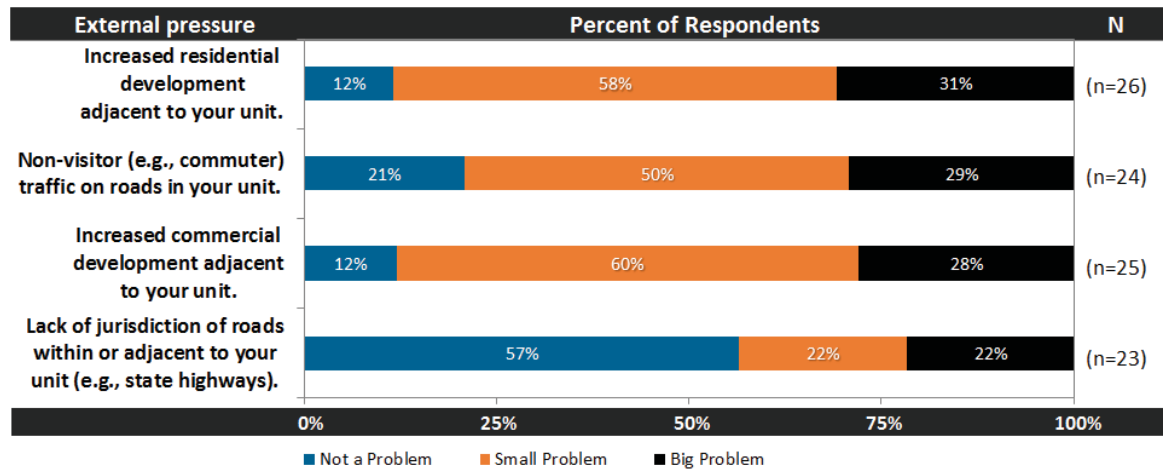
Park Unit	Unstaffed Entrance/ Access Points	Staffed Entrance/ Access Points	Total Entrance/ Access Points
Carl Sandburg Home National Historic Site	2	0	2
Kings Mountain National Military Park	3	0	3
Chickamauga and Chattanooga National Military Park	15+	1	16
Virgin Islands National Park	4	0	4
Fort Donelson National Battlefield and National Cemetery	5	0	5
Big South Fork National River and Recreation Area	100+	0	100
Obed Wild & Scenic River	13	0	13

Park Unit	Unstaffed Entrance/ Access Points	Staffed Entrance/ Access Points	Total Entrance/ Access Points
Chattahoochee River National Recreation Area	15	0	15
Guilford Courthouse National Military Park	12	0	12
Horseshoe Bend NMP	5	1	6
Jimmy Carter NHS	1	2	3
Natchez Trace Parkway - NATR	100+	0	100
Cane River Creole National Historic Park	5	0	5
Dry Tortugas National Park	1	1	2
Great Smoky Mountains National Park	11		11
Mammoth Cave National Park	9	0	9
Moore's Creek National Battlefield	1	0	1
Ocmulgee National Monument	2	0	2
Castillo De San Marcos and Fort Matanzas National Monuments	10		10
The Outer Banks Group (CAHA, FORA, WRBR)	being coastal parks these parks have unlimited access	1	1
Timucuan Ecological and Historic Preserve	4	3	7
Vicksburg NMP	20	2	22
Big Cypress National Preserve	23	0	23
De Soto NM	1	0	1
Kennesaw Mountain National Battlefield Park	7	0	7
Jean Lafitte NHP&P and New Orleans Jazz NHP	15		15
Gulf Islands National Seashore, MS, FL	18 (water=unlimited)	2	20

**FIGURE 7. PLEASE INDICATE HOW YOU PERCEIVE THE CURRENT CONDITION OF EACH OF THE FOLLOWING TRANSPORTATION COMPONENTS WITHIN YOUR UNIT.**



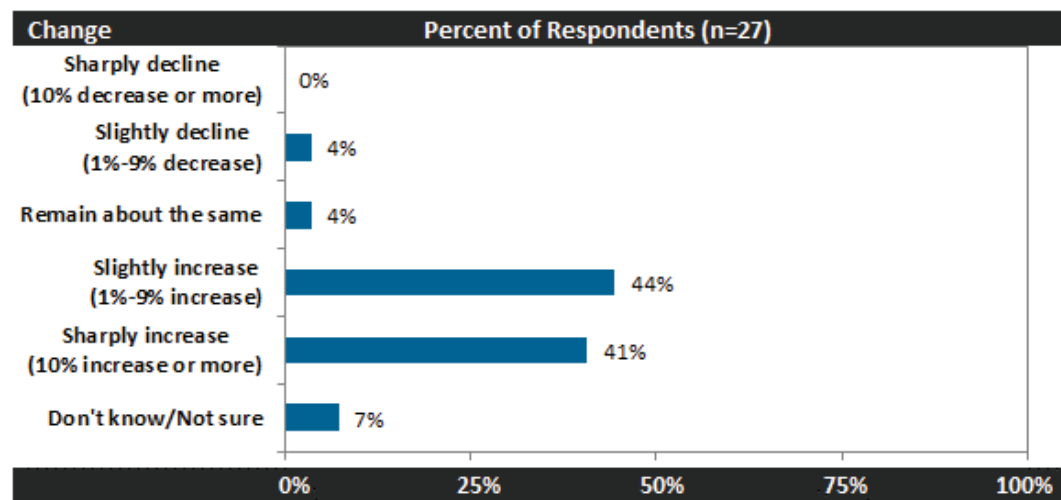
**FIGURE 8. TO WHAT EXTENT ARE THE FOLLOWING POTENTIAL EXTERNAL PRESSURES A PROBLEM FOR YOUR UNIT?**



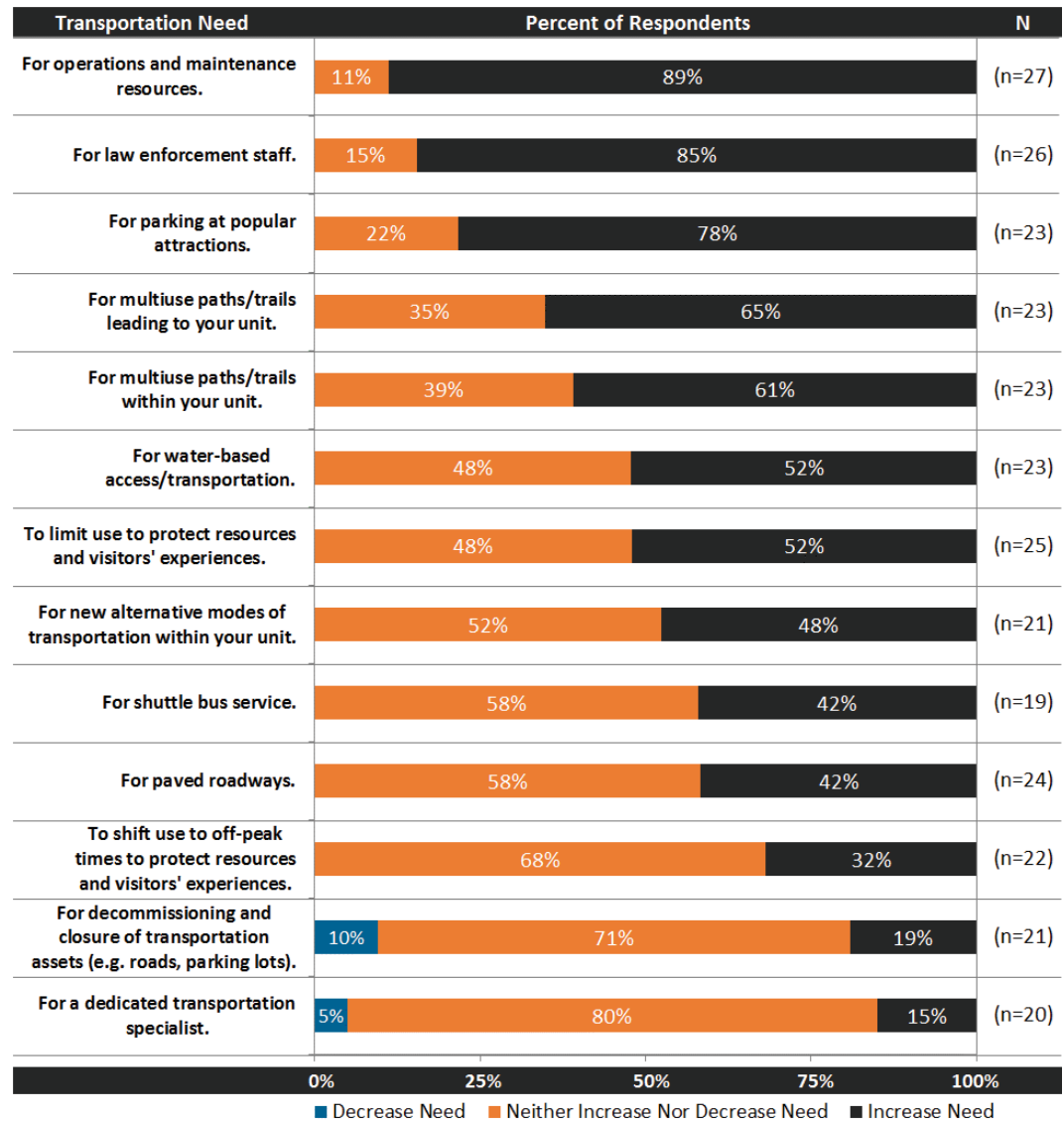
**TABLE 4. LIST OF OTHER RESPONSES (VERBATIM SURVEY RESPONSES)**

External Pressure	Unit	Rating
Derelict adjacent property located next to the Carter compound that poses a security risk, potential for structural fire, tree management, and visual effect.	Jimmy Carter NHS	Big Problem
Increased demand for authorized commercial access services which would exceed established carrying capacity	Dry Tortugas National Park	Small Problem
Lack of bicycle facilities connecting to each unit	Chattahoochee River National Recreation Area	Big Problem
Too many rental cars, not enough space, congestion is horrific during the winter months	Virgin Islands National Park	Big Problem

**FIGURE 9. HOW DO YOU EXPECT YOUR UNIT'S VISITATION TO CHANGE IN THE NEXT 10 YEARS?**



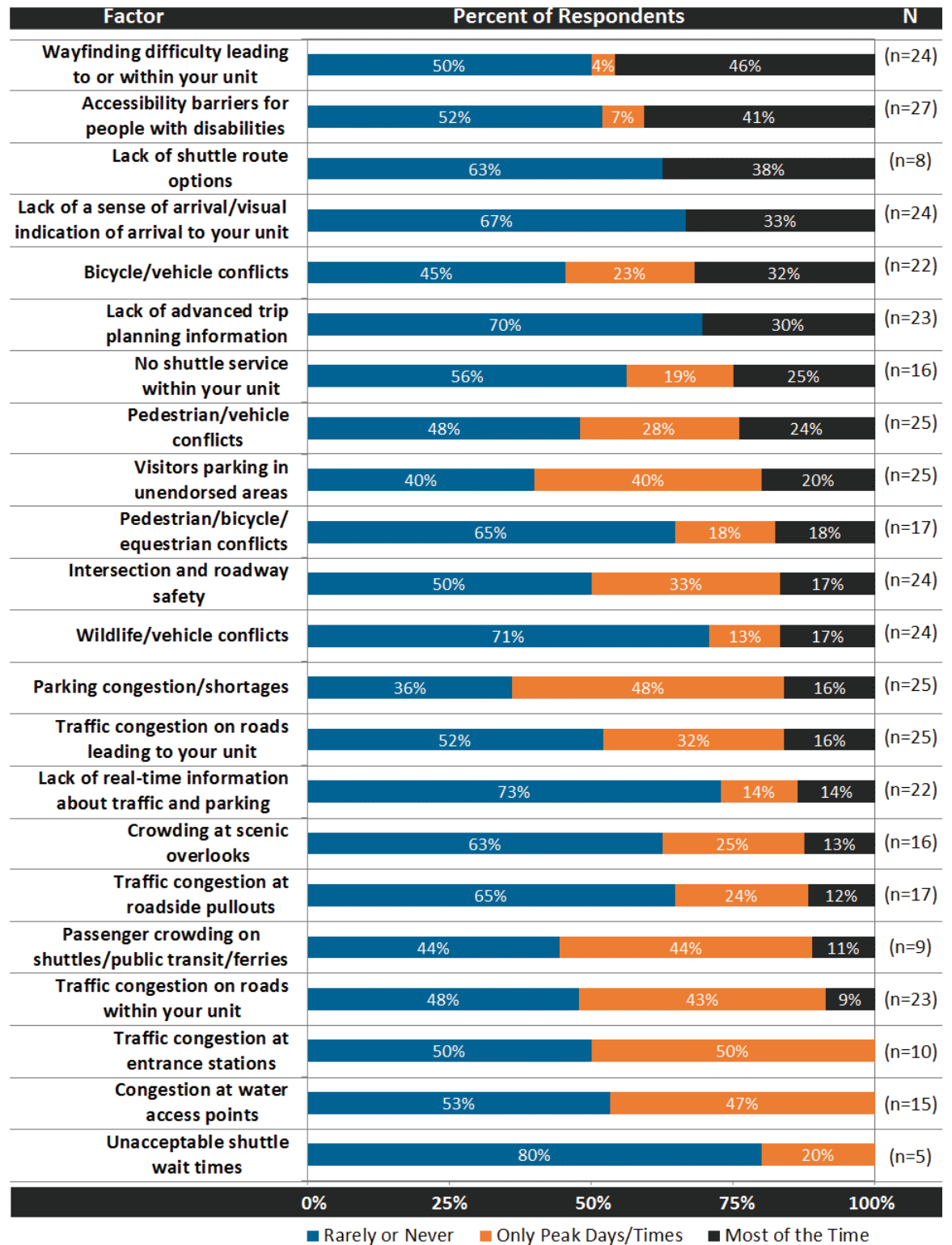
**FIGURE 10. HOW DO YOU EXPECT VISITATION TRENDS IN THE NEXT 10 YEARS WILL IMPACT TRANSPORTATION NEEDS IN YOUR UNIT?**



**TABLE 5. LIST OF NEW ALTERNATIVE MODES OF TRANSPORTATION WITHIN UNIT  
(VERBATIM SURVEY RESPONSES)**

<b>Mode</b>	<b>Unit</b>	<b>Rating</b>
Bicycle transportation and water transportation (kayaks, canoes, etc)	Virgin Islands National Park	Increase Need
Boat Tour/Tram Tour	(TIMU) Timucuan Ecological and Historic Preserve	Increase Need
Develop infrastructure for biking and running as a means of outreach and to support wellness.	Jimmy Carter NHS	Increase Need
Improved bike access and commercial transportation alternatives	Jean Lafitte NHP&P and New Orleans Jazz NHP	Increase Need
Not modes but technologies - all electric vehicles or alternative fuel vehicles will be greater use and support infrastructure for these technologies	Great Smoky Mountains National Park	Increase Need
Passenger Ferry, Shuttle Service, multi use path/trails	Gulf Islands National Seashore, MS, FL	Increase Need
Public transportation stops at the park	Kennesaw Mountain National Battlefield Park	Increase Need
Tram	Guilford Courthouse National Military Park	Increase Need
Transit, multi use trail	Virgin Islands National Park	Increase Need

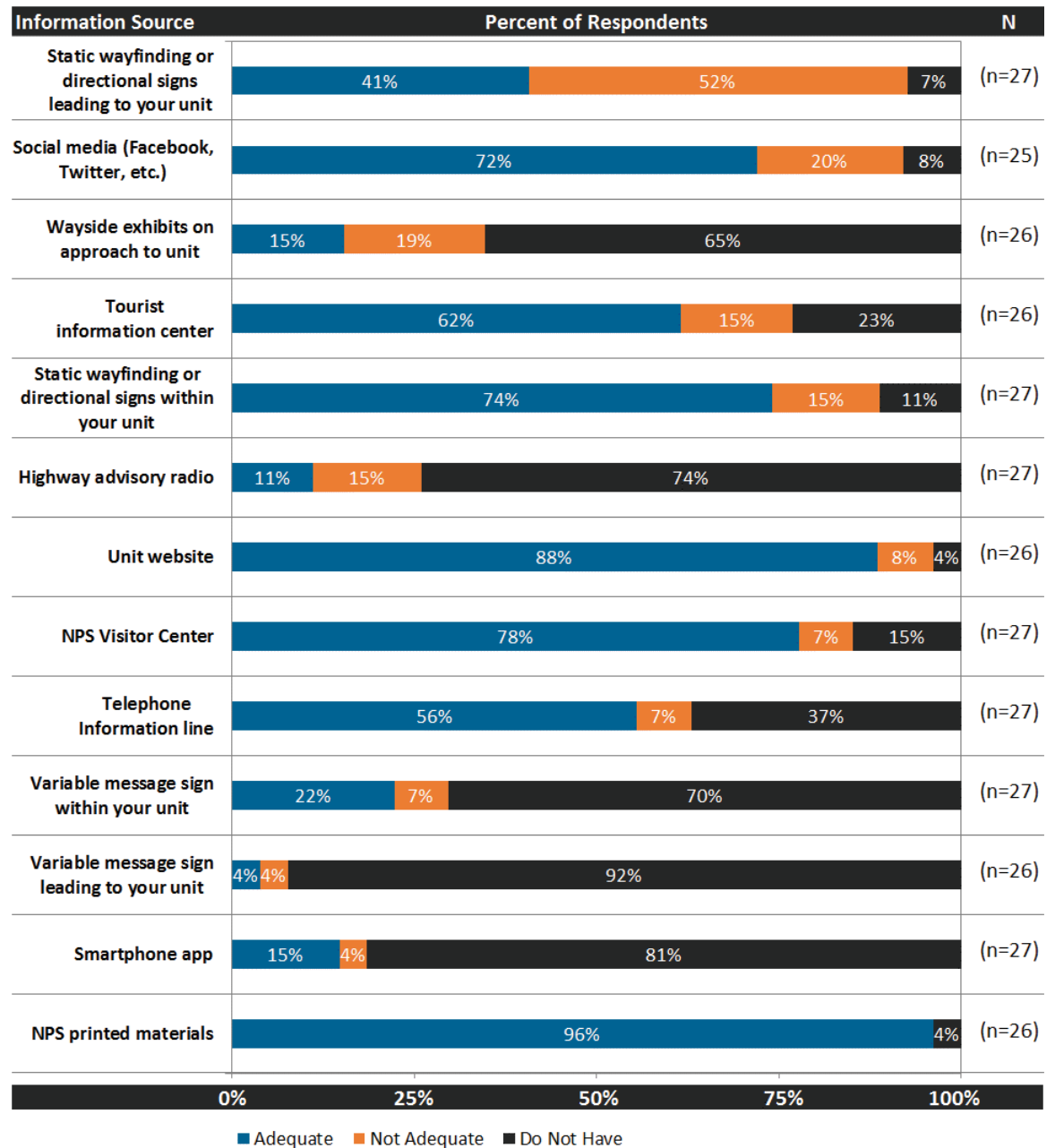
**FIGURE 11. TO WHAT EXTENT DO THE FOLLOWING FACTORS NEGATIVELY IMPACT VISITORS' EXPERIENCES WITHIN YOUR UNIT?**



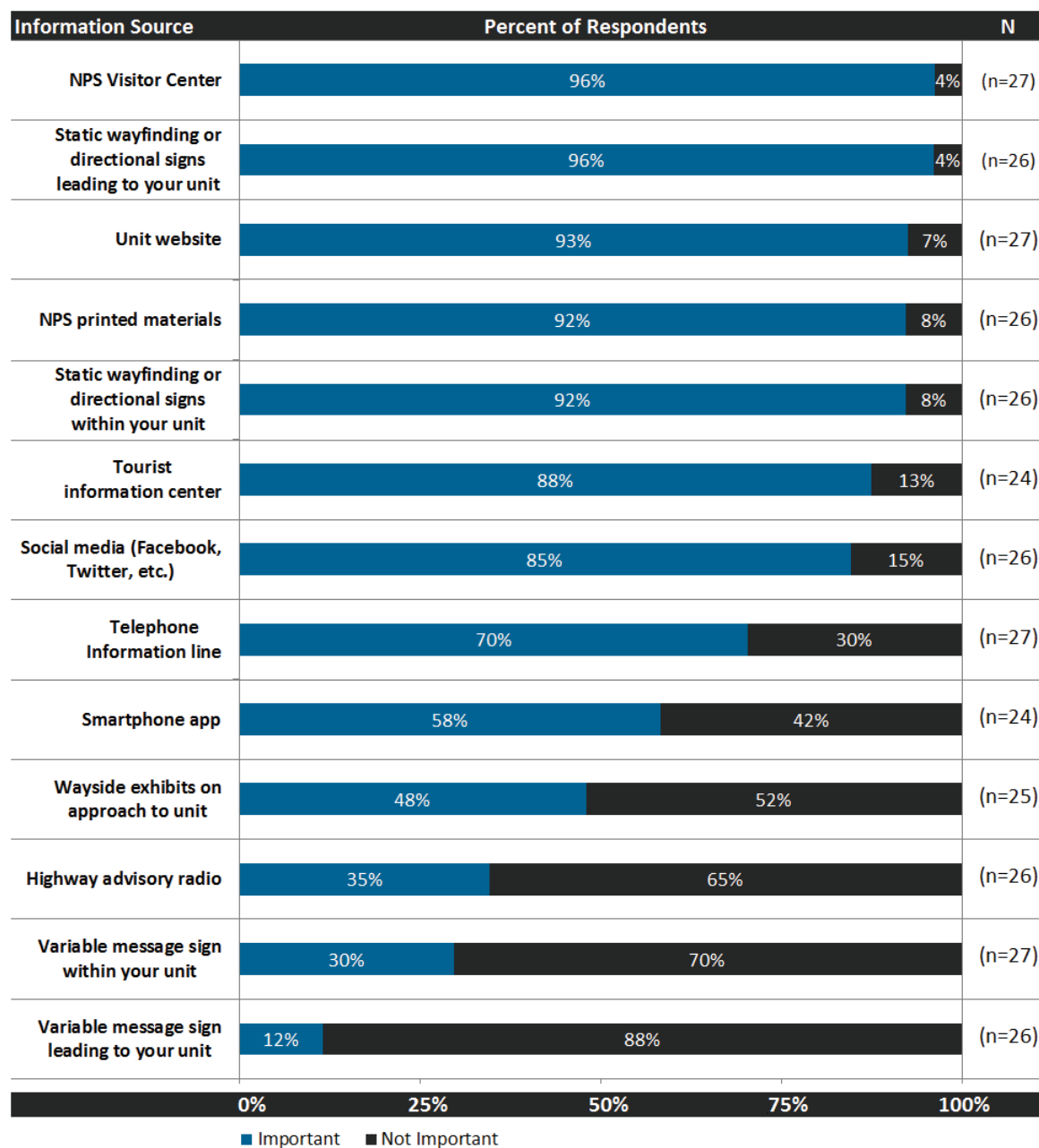
**TABLE 6. LIST OF OTHER FACTORS NEGATIVELY IMPACTING VISITORS' EXPERIENCES  
(VERBATIM SURVEY RESPONSES)**

<b>Factor</b>	<b>Unit</b>	<b>Rating</b>
For the 3rd one (Lack of a sense of arrival), some units could use better sense of arrival and wayfinding signage leading to the unit. Also, in a proposed/improved bicycle connection, wayfinding would be a key component to encourage people that a connected/safe route exists to experience each unit of the CRNRA.	Chattahoochee River National Recreation Area	n/a

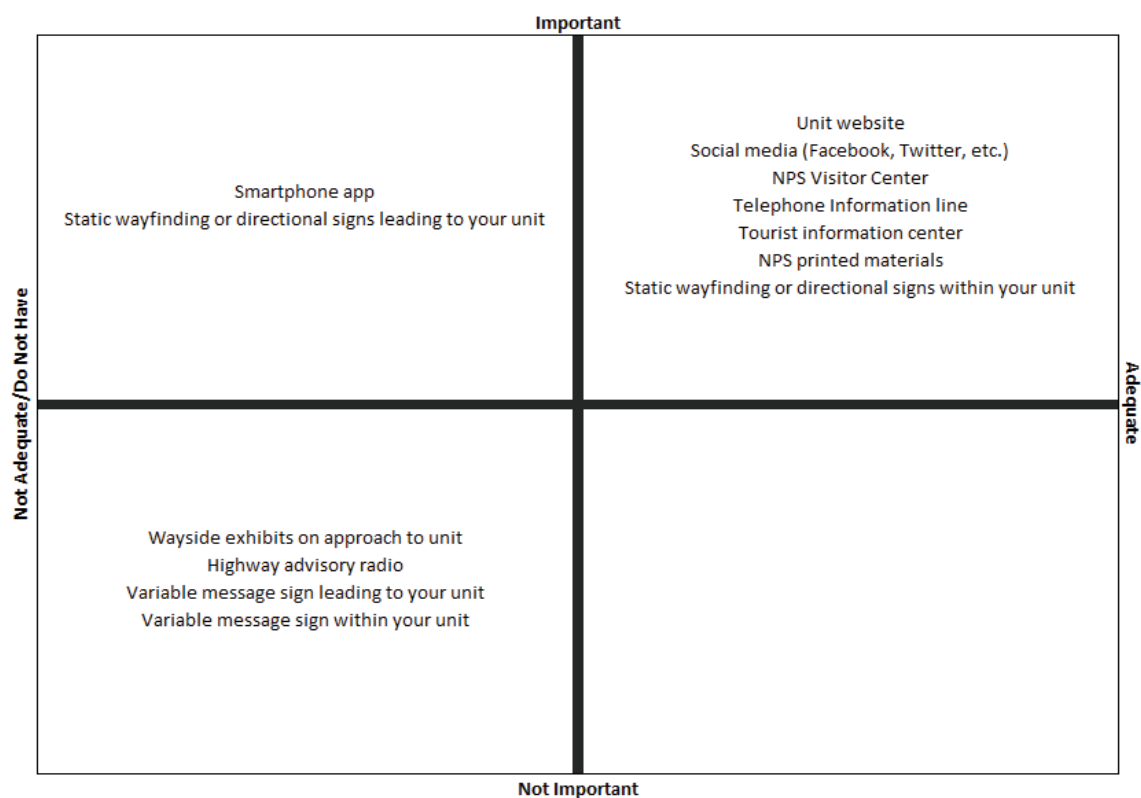
**FIGURE 12. FOR EACH OF THE FOLLOWING INFORMATION SOURCES, CHECK TO INDICATE WHETHER THE TRANSPORTATION INFORMATION YOUR UNIT PROVIDES THROUGH THE SOURCE IS ADEQUATE.**



**FIGURE 13. FOR EACH OF THE FOLLOWING INFORMATION SOURCES, CHECK TO INDICATE WHETHER HAVING THE TRANSPORTATION INFORMATION AVAILABLE THROUGH THE SOURCE IS IMPORTANT TO VISITORS.**



**FIGURE 14. FOR EACH OF THE FOLLOWING INFORMATION SOURCES, CHECK TO INDICATE WHETHER OR NOT: (A) THE TRANSPORTATION INFORMATION YOUR UNIT PROVIDES THROUGH THE SOURCE IS ADEQUATE; (B) HAVING TRANSPORTATION INFORMATION AVAILABLE THROUGH THE SOURCE IS IMPORTANT TO VISITORS - IMPORTANCE/ADEQUACY MATRIX**



**Note:** Information sources were placed in a quadrant within the matrix, based on majority responses to the adequacy and importance questions. For example, for “Unit website,” 88% of respondents reported that their Unit website was “Adequate” and 93% reported that their Unit website was “Important,” therefore “Unit website” is positioned in the upper right hand quadrant of the matrix.

**TABLE 7. LIST OF OTHER INFORMATION SOURCES (VERBATIM SURVEY RESPONSES)**

Information source	Unit	Rating
Highway Signs (I-75)	De Soto National Memorial	Do Not Have, Important
Transportation information to and from park is managed through the contracted seaplane and ferry operators	Dry Tortugas National Park	Adequate, Important

**FIGURE 15. PLEASE RATE THE FUNDING PRIORITY LEVEL FOR EACH OF THE FOLLOWING TRANSPORTATION IMPROVEMENTS IN YOUR UNIT.**

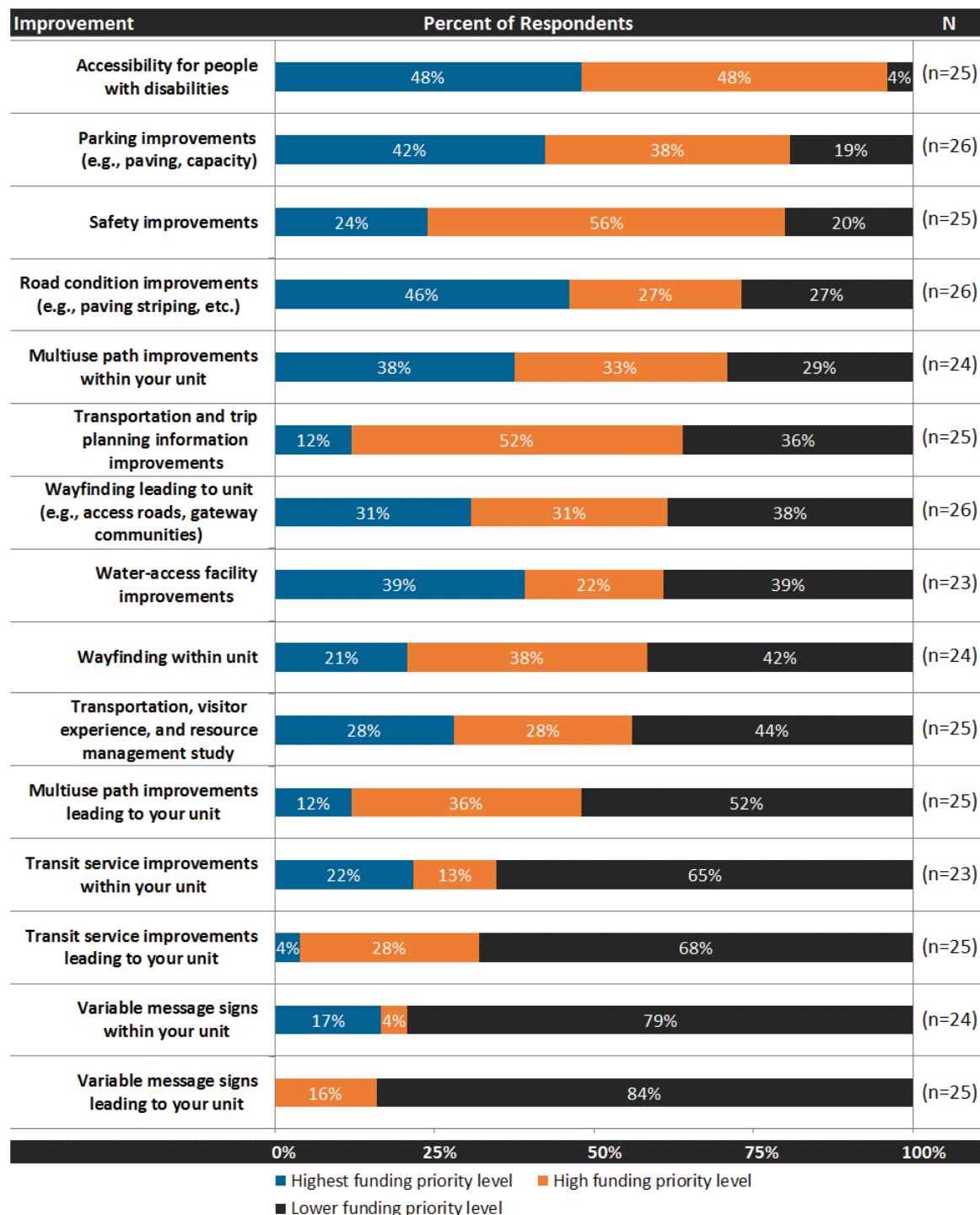
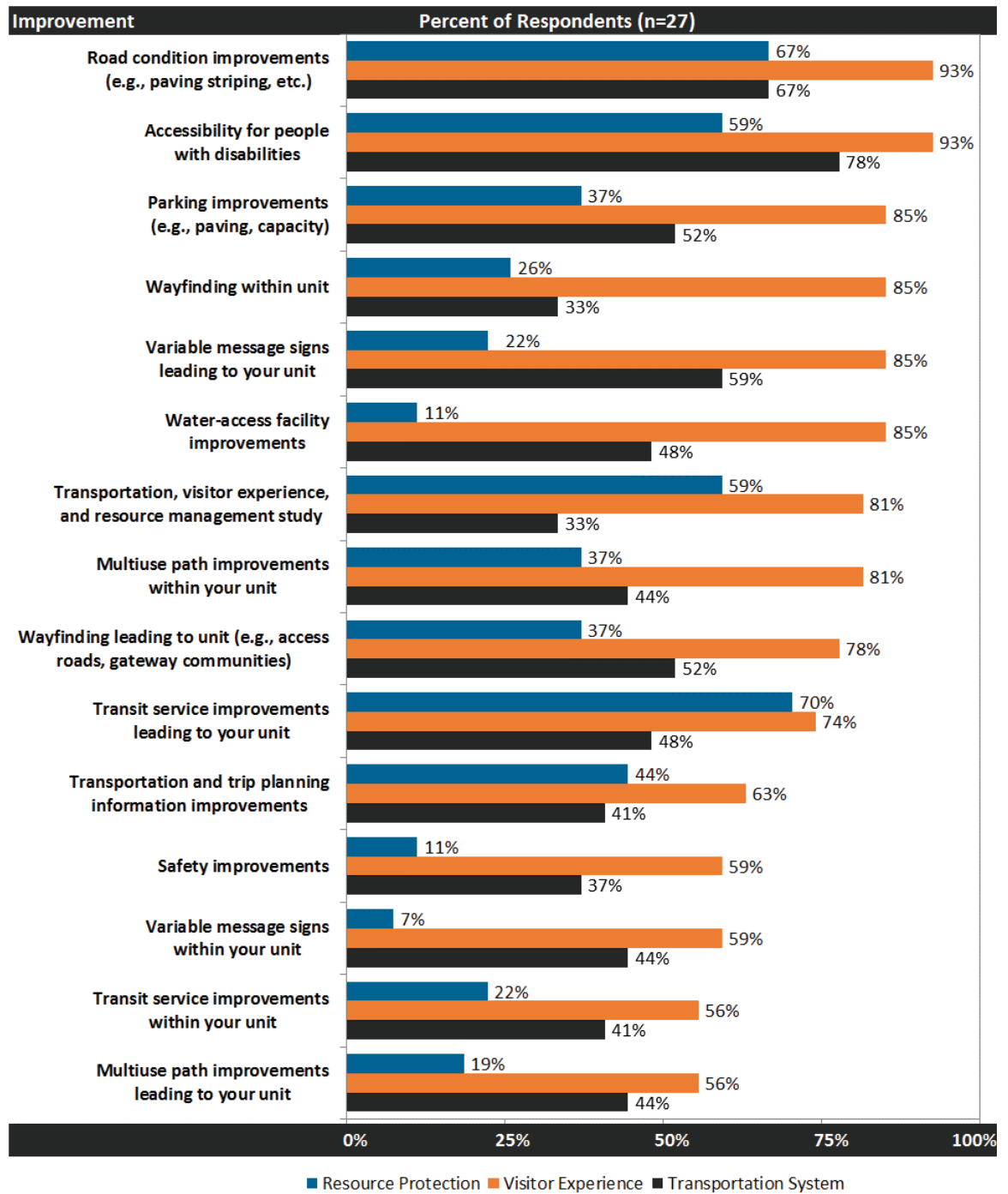


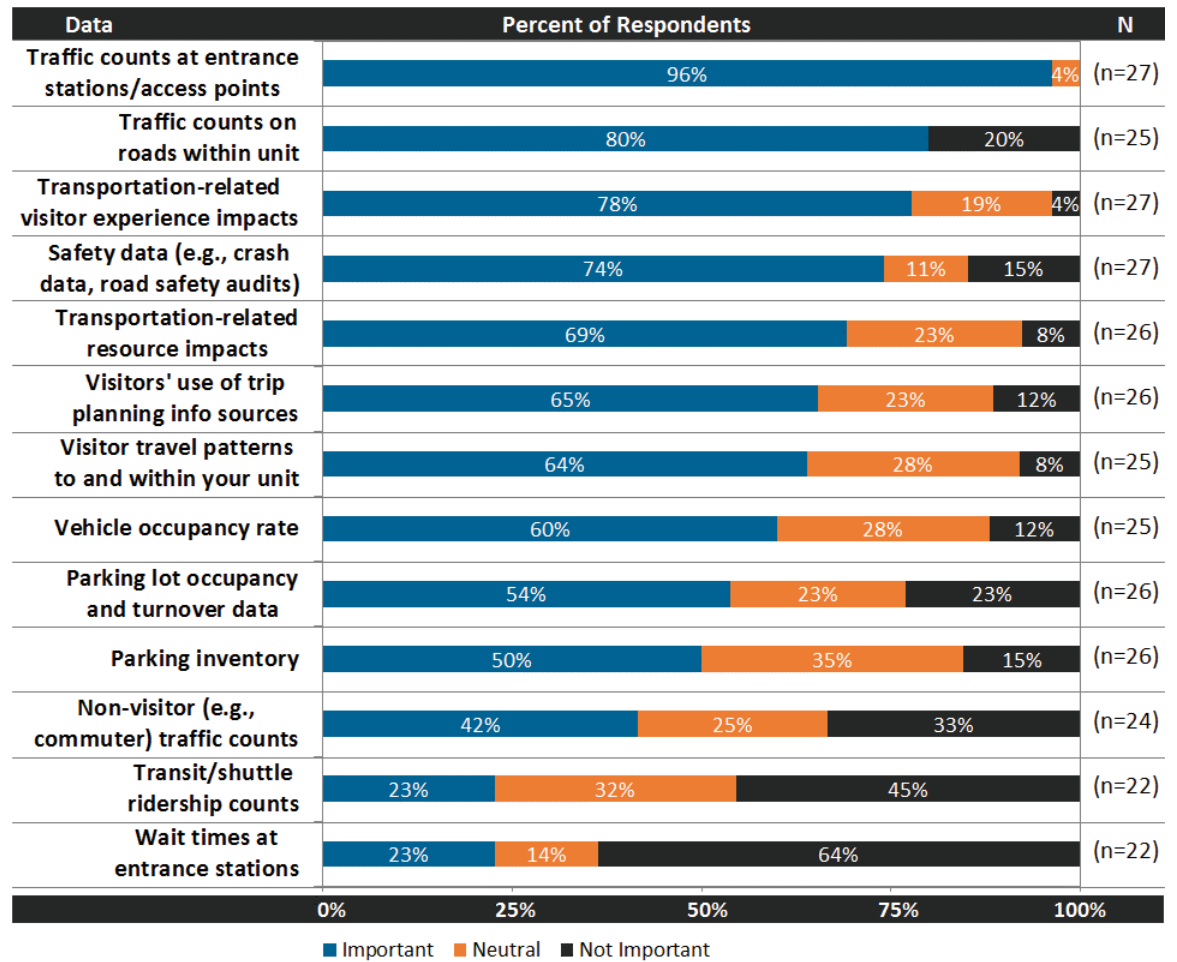
FIGURE 16. FOR EACH OF THE FOLLOWING TRANSPORTATION IMPROVEMENTS, PLEASE INDICATE WHICH NEEDS EACH WOULD ADDRESS.



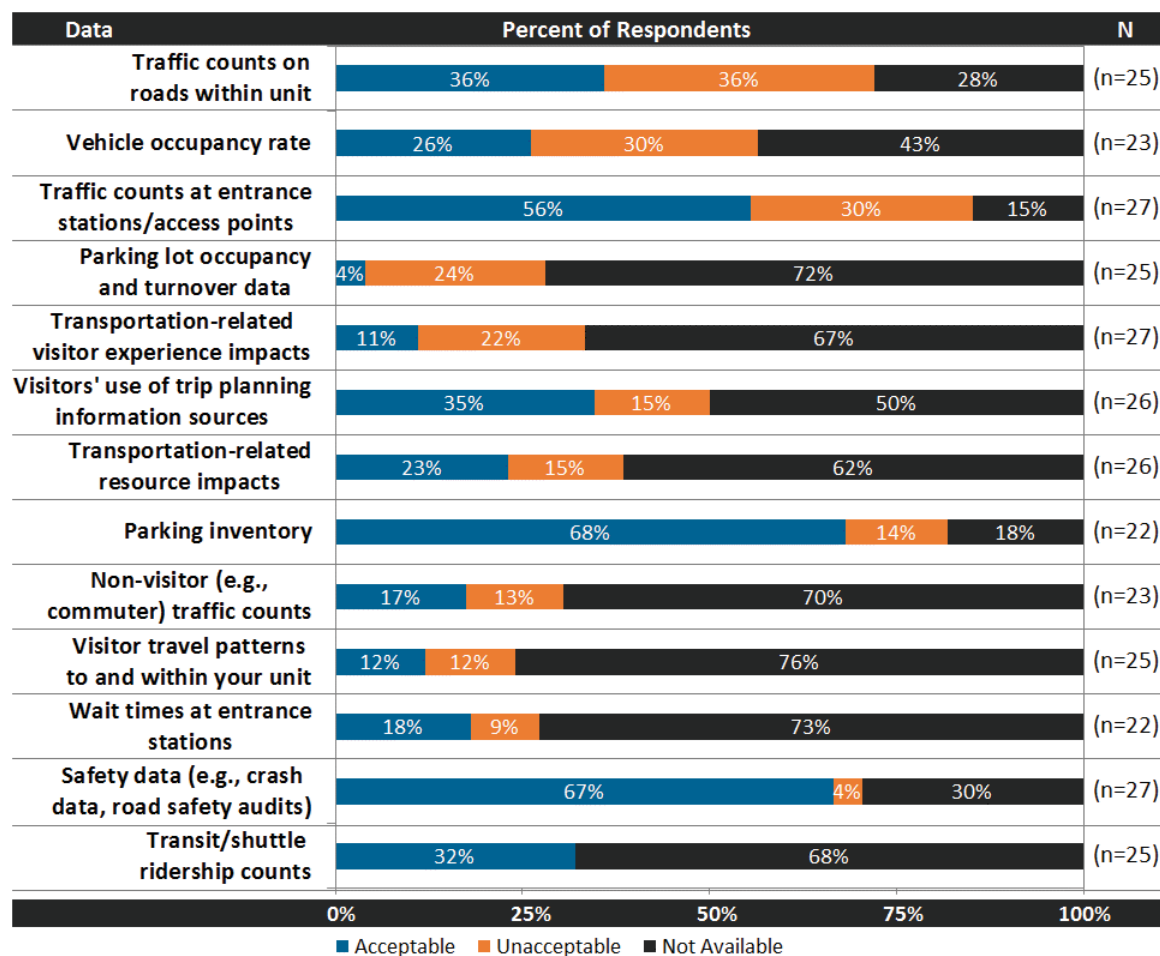
**TABLE 8. LIST OF OTHER TRANSPORTATION IMPROVEMENTS (VERBATIM SURVEY RESPONSES)**

<b>Improvement</b>	<b>Unit</b>	<b>Rating</b>
Increase bicycle connectivity (Expanding on Multi-use path improvements)	Chattahoochee River National Recreation Area	Highest funding priority level, for Resource Protection, Visitor Experience, Transportation System
Mitigating commercial vehicle (logging/large trucks) through park tour road - long used as public cut-through	Fort Donelson National Battlefield and National Cemetery	High funding priority level, for Resource Protection, Visitor Experience, Transportation System

FIGURE 17. PLEASE RATE HOW IMPORTANT THE FOLLOWING TRANSPORTATION-RELATED DATA ARE FOR MANAGEMENT OF YOUR UNIT.



**FIGURE 18. PLEASE RATE THE CURRENT PERCEIVED QUALITY OF THE FOLLOWING  
TRANSPORTATION-RELATED DATA AVAILABLE TO YOUR STAFF**

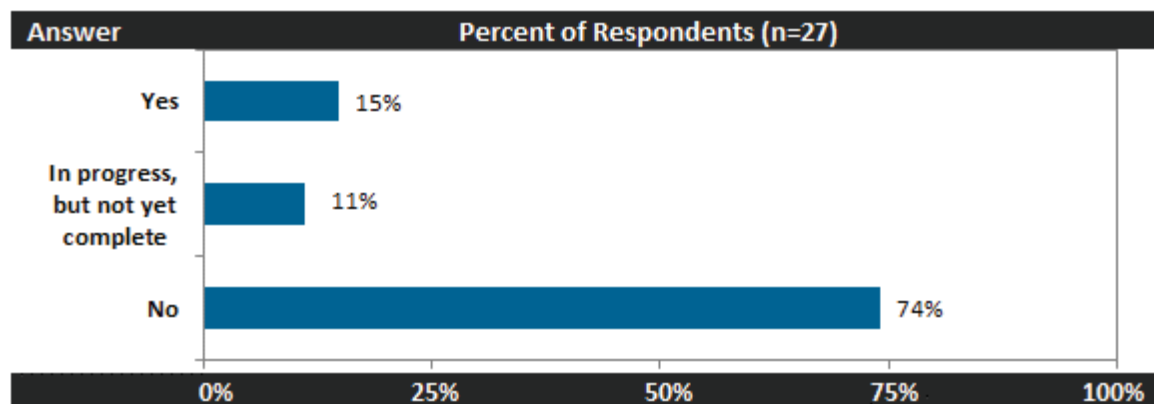


**FIGURE 19. PLEASE RATE HOW IMPORTANT THE FOLLOWING TRANSPORTATION-RELATED DATA ARE FOR MANAGEMENT OF YOUR UNIT AND THE CURRENT PERCEIVED QUALITY OF THE DATA AVAILABLE TO YOUR STAFF - ACCEPTANCE/IMPORTANCE MATRIX**



**Note:** Transportation data types were placed in a quadrant within the matrix, based on majority responses to the acceptability and importance questions. For example, for “Safety data,” 74% of respondents reported that Safety data were “Important” and 67% reported that Safety data were “Acceptable,” therefore “Safety data” is positioned in the upper right hand quadrant of the matrix.

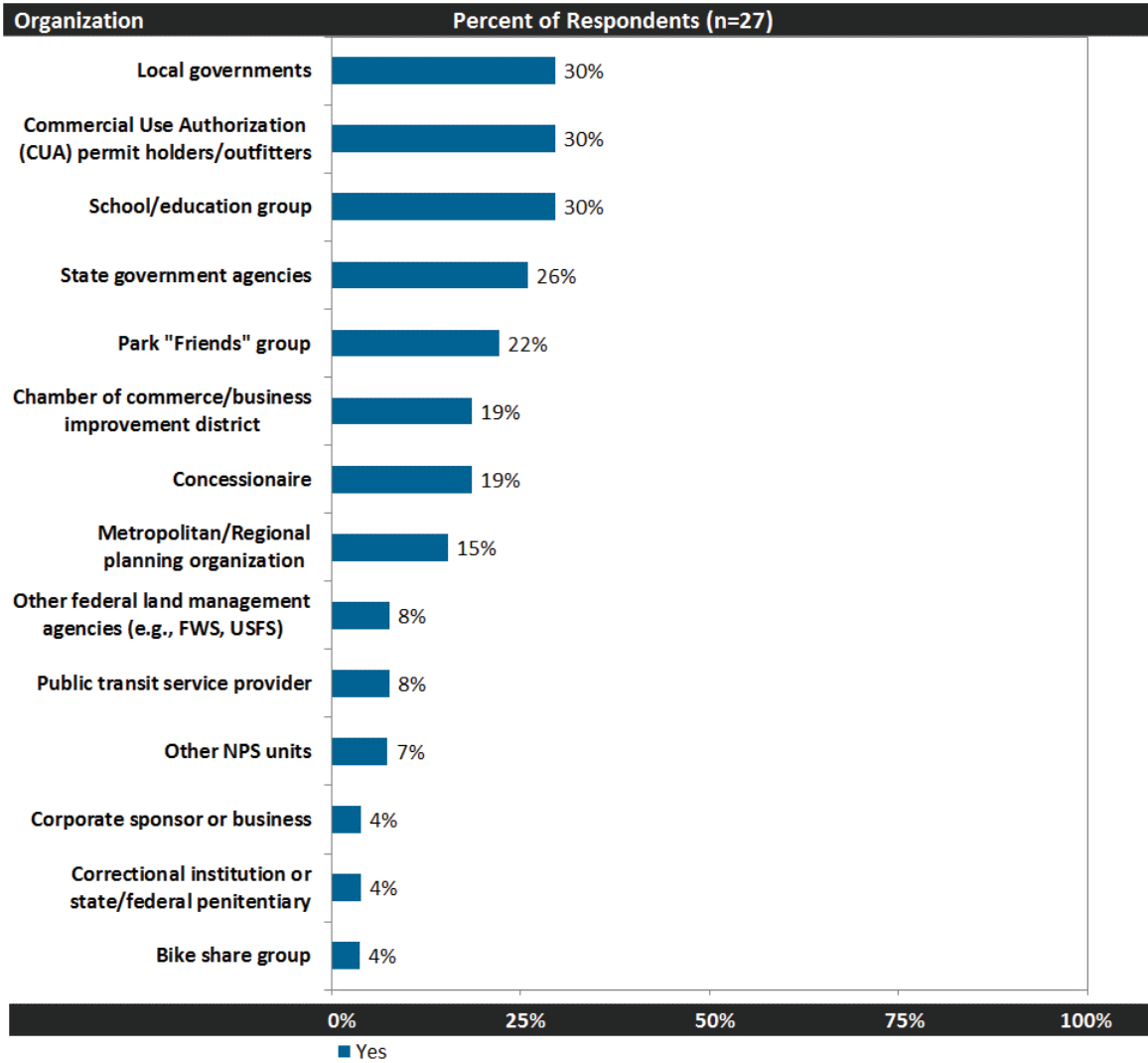
**FIGURE 20. HAS YOUR UNIT COMPLETED A SELF-EVALUATION AND TRANSITION PLAN TO ASSESS ACCESSIBILITY OF YOUR PROGRAMS, POLICIES, AND PRACTICES?**



**TABLE 9. LIST OF YEAR SELF-EVALUATION AND TRANSITION PLAN WAS COMPLETED**

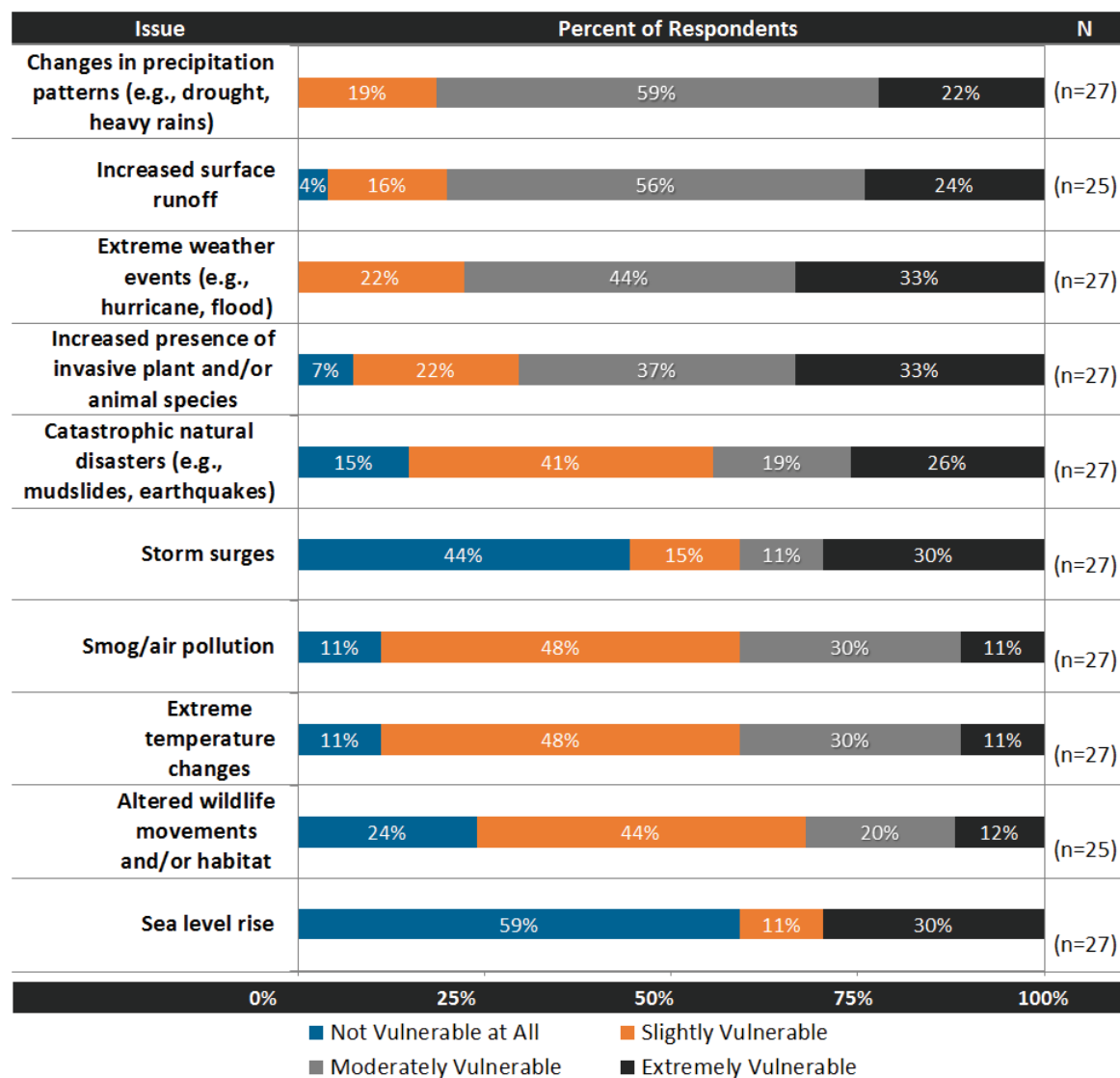
Year	Unit
~2009	Kings Mountain National Military Park
2010	The Outer Banks Group (CAHA, FORA, WRBR)
October 2012	Jimmy Carter NHS

**FIGURE 21. DOES YOUR UNIT HAVE TRANSPORTATION-RELATED PARTNERSHIPS WITH THE FOLLOWING ORGANIZATIONS?**

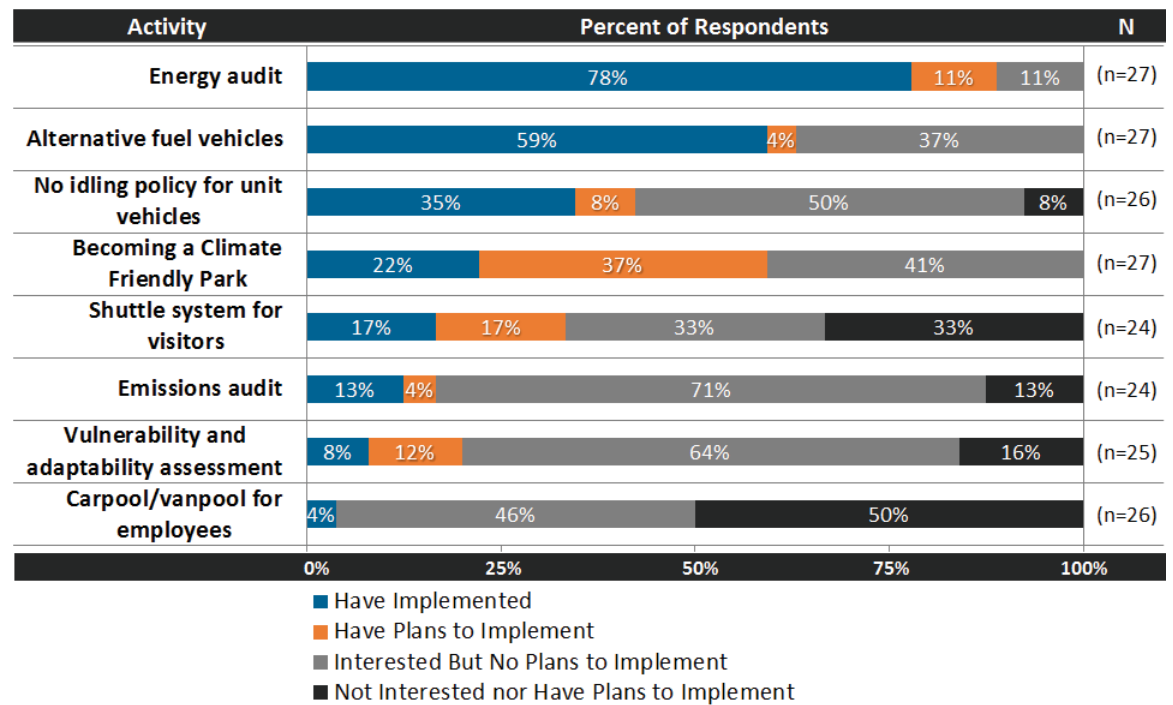


Refer to Appendix C for a verbatim list of partnership organizations listed by respondents.

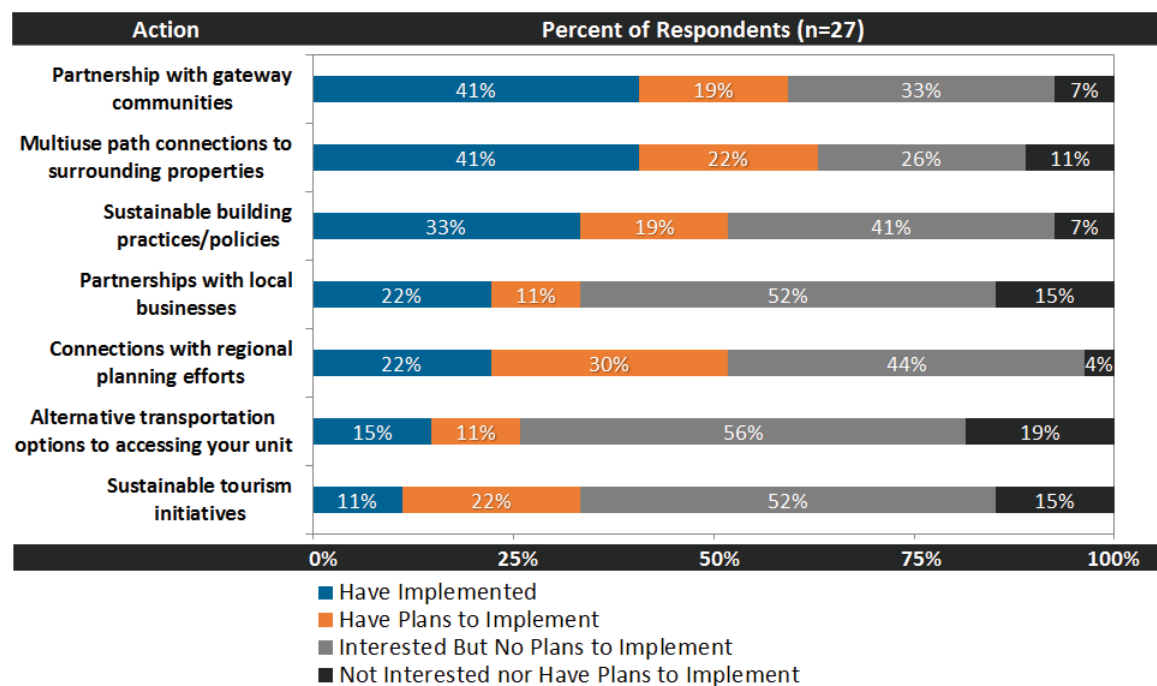
**FIGURE 22. PLEASE RATE HOW VULNERABLE YOUR UNIT'S TRANSPORTATION FACILITIES AND NETWORK ARE TO THE FOLLOWING CLIMATE CHANGE ISSUES.**



**FIGURE 23. IS YOUR UNIT CURRENTLY IMPLEMENTING OR PLANNING TO IMPLEMENT ANY OF THE FOLLOWING ACTIVITIES TO HELP ADDRESS CLIMATE CHANGE?**



**FIGURE 24. IS YOUR UNIT CURRENTLY IMPLEMENTING OR PLANNING TO IMPLEMENT ANY OF THE FOLLOWING ACTIONS TO HELP INFLUENCE LIVABILITY AND SUSTAINABILITY WITHIN COMMUNITIES IN YOUR UNIT'S SURROUNDING AREA?**



**TABLE 10. ARE THERE ANY OTHER THOUGHTS, CONCERNS, ISSUES, OR CHALLENGES RELATED TO TRANSPORTATION WITHIN YOUR UNIT THAT ARE SIGNIFICANT TODAY OR THAT YOU BELIEVE WILL HAVE AN INCREASING IMPACT ON YOUR UNIT IN THE COMING DECADES? (VERBATIM SURVEY RESPONSES)**

Comments	Unit
All four adjacent counties and gateway cities/communities have an increase and projected increase in population into the future, with some areas having a significant increase. The park needs a bicycle/pedestrian connectivity plan to: 1) mitigate this foreseen congestion to/from/within the CRNRA, 2) to provide for an alternate transportation and more sustainable connection to the park, 3) to expand on the growing millennial generation desire to have better bicycle facilities/connections 4) to expand on a “bicycle tourism” connection to the CRNRA and the gateway communities, 5) to connect to the ever-growing regional multi-use path network.	Chattahoochee River National Recreation Area
BICY is experiencing demographic changes in our users and stakeholders, the effects of which are not fully understood. We are experiencing first-time requests for aircraft use and delivery into the Preserve, above our current air tour use which originates and concludes outside the Preserve boundary. One U.S. highway and one Interstate highway each bisect the Preserve. The U.S. highway is seeing increased use by commercial trucking interests who sometimes prefer that route over the interstate which is a toll route. Both highways make east to west connections to the Florida coasts. The Preserve desires to discover alternatives to current transportation uses, but recognizes that interest in pursuing these alternatives by potential users and infrastructure providers is influenced by the distances from the Preserve to the population centers on either coast.	Big Cypress National Preserve
Broadening bike-run-walk access to the park to encourage visitors to combine wellness activities into their park visits. We see this as being a longterm initiative that supports sustainable park visits and allows visitors to circulate among the park sites without relying on personal automobiles.	Jimmy Carter NHS
Our largest issue is that we do not have an adequate stream of funding to maintain our roadway assets.	Natchez Trace Parkway - NATP
The addition of the battlefields at Raymond, Port Gibson, and Champion Hill will alter our responses to almost every question on this survey. Our responses reflect our best predictive answer given a 5-10 year timeframe (for acquisition, development, visitation, etc.)	Vicksburg NMP

Comments	Unit
Transportation is an interesting issue at VIIS. The park suffers from congestion at all parking lots and the road way closes to the beaches. The transit service is provided by independently owned taxi services. There was a planning effort here in the past and a transportation scholar was assigned to the park. During her time here she was able to work with the taxi drivers and relay their concerns and issues. We could use more coordination with the taxi drivers and that is something we are committed to doing.	Virgin Islands National Park
We have answered the above to the best of our ability. FODO will need to do extensive planning in the coming year(s) as to implementing a new tour route so as to include and interpret the 400+ new acres that the park has acquired. Also, a dangerous road (sloughing, steep drop-offs, no railings) at the Ft. Heiman, Kentucky, unit was acquired by the park some years ago. Actual legal undertaking has been held off as solicitor feels NPS does not own road since it is not specifically mentioned in deed. FODO plans to correct this and have road closed until improvements can be made.	Fort Donelson National Battlefield and National Cemetery

## APPENDIX A. SURVEY INSTRUMENT

---

**National Park Service  
Southeast Region  
Long Range Transportation Plan Survey  
2014**



The Southeast Regional Office (SERO) is undertaking the initial long-range transportation planning process for the region. As part of this planning effort, SERO is administering a survey to the Superintendent of every NPS unit within the region to inquire about transportation conditions, needs, and opportunities. Please involve the necessary staff within your unit to answer the questions as accurately as possible.

Information collected through this survey will be used to inform the planning process and help identify transportation-related funding priorities within your unit and the region. Please take this opportunity to complete the survey and provide the SERO with information about your unit that is important to the LRTP process within the Southeast Region.

**THANK YOU IN ADVANCE FOR ASSISTING SERO STAFF WITH THIS EFFORT.**

### A. Unit Description

1. What is the name of your unit?

\_\_\_\_\_

2. How would you best describe the surrounding area in which your unit is situated? (Check one box.)

- ☐ Urban  
☐ Suburban  
☐ Outlying  
☐ Rural  
☐ Remote  
☐ Mixed  
☐ Other (Please specify): \_\_\_\_\_

3. What modes of transportation do visitors use to (A) access your unit, and (B) travel within your unit? (Check all that apply for access to and travel within.)

	Access to Unit	Travel Within Unit
Personal vehicle	<input type="checkbox"/>	<input type="checkbox"/>
Transit/shuttle bus	<input type="checkbox"/>	<input type="checkbox"/>
Commercial tour bus	<input type="checkbox"/>	<input type="checkbox"/>
Bike/Walk on paved multiuse path	<input type="checkbox"/>	<input type="checkbox"/>
Bike/Walk on road/sidewalk	<input type="checkbox"/>	<input type="checkbox"/>
Water-based access (ferries, canoes/kayaks)	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify): _____	<input type="checkbox"/>	<input type="checkbox"/>

4. Approximately how many staffed and unstaffed entrances/access points to your unit are there? (Enter number for each row.)

	Number (Enter "0" if none)
Unstaffed access points	_____
Staffed access points	_____

5. Please indicate how you perceive the current condition of each of the following transportation components within your unit. (Check one box for each line.)

	All or Most in Good/Excellent Condition	Conditions Range from Fair/Poor to Good/Excellent	All or Most in Fair/Poor Condition	Not Applicable
Paved roadways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dirt/gravel roadways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Paved parking areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dirt/gravel parking areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bridges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tunnels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stormwater management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pullouts along roadways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Entrances/access points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Entrance stations/booths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shuttle bus stops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water access facilities (e.g., docks, boat ramps)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiuse paths/trails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicycle facilities (bike racks/lockers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Traffic counting equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. To what extent are the following potential external pressures a problem for your unit?  
(Check one box for each line.)

	Big Problem	Small Problem	Not a Problem	Not Applicable
Increased residential development adjacent to your unit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased commercial development adjacent to your unit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of jurisdiction of roads within or adjacent to your unit (e.g., state highways).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-visitor (e.g., commuter) traffic on roads in your unit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**B. Visitation & Transportation-related Visitor Experiences**

7. How do you expect your unit's visitation to change in the next 10 years? (Check one box.)

- ☐ Sharply decline (10% decrease or more)  
☐ Slightly decline (1%-9% decrease)  
☐ Remain about the same  
☐ Slightly increase (1%-9% increase)  
☐ Sharply increase (10% increase or more)  
☐ Don't know/Not sure

8. How do you expect visitation trends in the next 10 years will impact transportation needs in your unit? (Check one box for each line.)

	Increase Need	Decrease Need	Neither Increase nor Decrease Need	Don't Know/ Not Sure
...for paved roadways.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for shuttle bus service.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for multiuse paths/trails leading to your unit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for multiuse paths/trails within your unit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for parking at popular attractions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for water-based access/transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...to limit use to protect resources and visitors' experiences.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...to shift use to off-peak times to protect resources and visitors' experiences.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for operations and maintenance resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for decommissioning and closure of transportation assets (e.g. roads, parking lots).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for a dedicated transportation specialist.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for law enforcement staff.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...for new alternative modes of transportation within your unit. (Specify mode(s): _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. To what extent do the following factors negatively impact visitors' experiences within your unit? (Check one box for each line.)

	Negatively impacts visitors' experiences...				Not Applicable
	Most of the Time	Only on Peak Days/Times	Rarely	Never	
Traffic congestion on roads leading to your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Traffic congestion at entrance stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of a sense of arrival/visual indication of arrival to your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Traffic congestion on roads within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parking congestion/shortages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Traffic congestion at roadside pullouts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crowding at scenic overlooks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of advanced trip planning information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of real-time information about traffic and parking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wayfinding difficulty leading to or within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No shuttle service within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of shuttle route options	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unacceptable shuttle wait times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Passenger crowding on shuttles/public transit/ferries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visitors parking in unendorsed areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intersection and roadway safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accessibility barriers for people with disabilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pedestrian/vehicle conflicts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife/vehicle conflicts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicycle/vehicle conflicts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pedestrian/bicycle/equestrian conflicts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Congestion at water access points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C. Visitor Information & Communications Technology

10. For each of the following information sources, check one box to indicate whether or not:  
(A) the transportation information your unit provides through the source is adequate;  
(B) having transportation information available through the source is important to visitors.

	(A) Adequacy of transportation information			(B) Importance to visitors	
	Adequate	Not Adequate	Do Not Have	Important	Not Important
Unit website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social media (Facebook, Twitter, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smartphone app	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NPS Visitor Center	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wayside exhibits on approach to unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Highway advisory radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Variable message sign leading to your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Variable message sign within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Telephone information line	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tourist information center	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NPS printed materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Static wayfinding or directional signs leading to your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Static wayfinding or directional signs within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### D. Transportation Improvements & Funding

11. Please rate the funding priority level for each of the following transportation improvements in your unit, and indicate which needs each would address. (For each line, check one box for funding priority level and check all needs that apply.)

NOTE: You may check "Highest" for up to five (5) items.

	Funding priority level (check <b>one</b> for each line)			Need addressed (check <b>all that apply</b> for each line)		
	Highest	High	Lower	Resource Protection	Visitor Experience	Transportation System
Road condition improvements (e.g., paving, striping, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parking improvements (e.g., paving, capacity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wayfinding leading up to unit (e.g., access roads, gateway communities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wayfinding within unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiuse path improvements leading to your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiuse path improvements within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Variable message signs leading to your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Variable message signs within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation and trip planning information improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transit service improvements leading to your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transit service improvements within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water-access facility improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation, visitor experience, and resource management study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accessibility for people with disabilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify): _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Please rate how important the following transportation-related data are for management of your unit and the current perceived quality of the data available to your staff. (Check one box for each line for both importance and the current quality of data.)

	Importance of Data			Current Quality of Data		
	Important	Neutral	Not Important	Acceptable	Unacceptable	Not Available
Traffic counts at entrance stations/access points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Traffic counts on roads within unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parking lot occupancy and turnover data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visitor travel patterns to and within your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transit/shuttle ridership counts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-visitor (e.g., commuter) traffic counts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visitors' use of trip planning information sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation-related resource impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation-related visitor experience impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety data (e.g., crash data, road safety audits)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parking inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle occupancy rate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wait times at entrance stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Has your unit completed a *Self-Evaluation and Transition Plan* to assess accessibility of your programs, policies, and practices? (Check one box.)

- ☐ Yes (Year completed: \_\_\_\_\_)
- ☐ In progress, but not yet complete
- ☐ No

14. Does your unit have transportation-related partnerships with the following organizations? (Check one box for each line.)

	No	Yes	
Other NPS units	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Other federal land management agencies (e.g., Fish & Wildlife Service, US Forest Service, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
State government agencies	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Local governments	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Metropolitan/Regional planning organization	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Chamber of commerce/business improvement district	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Corporate sponsor or business	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Concessionaire	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Commercial Use Authorization (CUA) permit holders/outfitters	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Public transit service provider	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Bike share group	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Park "Friends" group	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
School/education group	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Correctional institution or state/federal penitentiary	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____
Other (Please specify): _____	<input type="checkbox"/>	<input type="checkbox"/>	Specify: _____

E. Climate Change, Sustainability, & Livability

15. Please rate how vulnerable your unit's transportation facilities and network are to the following climate change issues. (Check one box for each line.)

	Extremely Vulnerable	Moderately Vulnerable	Slightly Vulnerable	Not Vulnerable at All
Sea level rise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Storm surges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased surface runoff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Catastrophic natural disasters (e.g., mudslides, earthquakes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Altered wildlife movements and/or habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased presence of invasive plant and/or animal species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smog/air pollution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extreme temperature changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extreme weather events (e.g., hurricane, flood)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Changes in precipitation patterns (e.g., drought, heavy rains)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Is your unit currently implementing or planning to implement any of the following activities to help address climate change? (Check one box for each line.)

	Have Implemented	Have Plans to Implement	Interested But No Plans to Implement	Not Interested nor Have Plans To Implement
Becoming a <i>Climate Friendly Park</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shuttle system for visitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carpool/vanpool for employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alternative fuel vehicles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No idling policy for unit vehicles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emissions audit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy audit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vulnerability and adaptability assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Is your unit currently implementing or planning to implement any of the following actions to help influence livability and sustainability within communities in your unit's surrounding area? (Check one box for each line.)

	Have Implemented	Have Plans to Implement	Interested But No Plans to Implement	Not Interested nor Have Plans To Implement
Partnership with gateway communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiuse path connections to surrounding properties	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alternative transportation options to accessing your unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Partnerships with local businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Connections with regional planning efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sustainable tourism initiatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sustainable building practices/policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify: _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>F. Other Comments</b>
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18. Are there any other thoughts, concerns, issues, or challenges related to transportation within your unit that are significant today or that you believe will have an increasing impact on your unit in the coming decades?

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**THANK YOU  
FOR YOUR RESPONSES TO THIS  
SERO TRANSPORTATION SURVEY.**

**Please return your completed survey to  
[teresa\\_cantrell@nps.gov](mailto:teresa_cantrell@nps.gov) and [kent\\_cochran@nps.gov](mailto:kent_cochran@nps.gov)  
by no later than January 16<sup>th</sup>, 2015.**

## APPENDIX B. LIST OF RESPONDING SOUTHEAST REGION PARK UNITS

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**TABLE 11. RESPONDING SOUTHEAST REGION PARK UNITS**

<b>Park Unit Name</b>	<b>NPS Park Unit Code</b>
Big Cypress National Preserve	BICY
Big South Fork National River and Recreation Area	BISO
Cane River Creole National Historic Park	CARI
Carl Sandburg Home National Historic Site	CARL
Castillo De San Marcos and Fort Matanzas National Monuments	CASA & FOMA
Chattahoochee River National Recreation Area	CHAT
Chickamauga and Chattanooga National Military Park	CHCH
De Soto NM	DESO
Dry Tortugas National Park	DRTU
Fort Donelson National Battlefield and National Cemetery	FODO
Great Smoky Mountains National Park	GRSM
Guilford Courthouse National Military Park	GUCO
Gulf Islands National Seashore, MS, FL	GUIS
Horseshoe Bend NMP	HOBE
Jean Lafitte NHP&P and New Orleans Jazz NHP	JELA & JAZZ
Jimmy Carter NHS	JICA
Kennesaw Mountain National Battlefield Park	KEMO
Kings Mountain National Military Park	KIMO
Mammoth Cave National Park	MACA
Moore's Creek National Battlefield	MOCR
Natchez Trace Parkway - NATR	NATR
Obed Wild & Scenic River	OBED
Ocmulgee National Monument	OCMU
The Outer Banks Group	CAHA, FORA, & WRBR
Timucuan Ecological and Historic Preserve	TIMU
Vicksburg NMP	VICK
Virgin Islands National Park	VIIS

## APPENDIX C. TRANSPORTATION-RELATED PARTNERSHIPS – VERBATIM RESPONSES

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**TABLE 12. LIST OF SOUTHEAST REGION UNITS THAT HAVE ESTABLISHED PARTNERSHIPS WITH OTHER ORGANIZATIONS (VERBATIM SURVEY RESPONSES)**

Unit	Partnership	Type of Partnership
Big South Fork National River and Recreation Area	OBRI	Other NPS units
	Pickett State Park, TDOT	State government agencies
	Fentress, Pickett, Scott & McCreary	Local governments
	Fentress, Pickett, Scott & McCreary	Chamber of commerce/business improvement district
	BSFSRR	Concessionaire
	Horse Camps, Stables	Commercial Use Authorization (CUA) permit holders/outfitters
	IBMA, Horse Groups, Trail Groups	Park "Friends" group
Chattahoochee River National Recreation Area	Cumberland Community Improvement District	Chamber of commerce/business improvement district
	Nantahala Outdoor Center	Concessionaire
	Marta services for handicapped employees	Public transit service provider
	Chattahoochee Parks Conservancy - Ticket- to - ride grant	Park "Friends" group
	Ticket to ride recipient schools	School/education group
Dry Tortugas National Park	One seaplane and one ferry operations	Concessionaire
	CUAs for sightseeing, fishing, diving, birdwatching	Commercial Use Authorization (CUA) permit holders/outfitters
	for curriculum-based environmental education	School/education group
Great Smoky Mountains National Park	BIA Repeater Sites	Other federal land management agencies
	Fire response, Ambulance, First Responders; in Past Clean Cities membership	Local governments
	Not currently - but in the past - Knoxville TPO- Cades Cove alternatives Plan	Metropolitan/Regional planning organization
	In the past Toyota, Ford Foundation	Corporate sponsor or business
	Horse concessions operations, LeConte cabins, firewood at Elkmont, bike rental and store in Cades Cove	Concessionaire

Unit	Partnership	Type of Partnership
	No but City of Gatlinburg runs a short route in the park to Sugarlands Visitor Center and Elkmont	Public transit service provider
	Great Smoky Mountains Association (GSMA); Friends of the Smokies	Park "Friends" group
	Parks as Classrooms with Gatlinburg Pi Beta Phi elementary school	School/education group
Guilford Courthouse National Military Park	Transit system recommended in Battleground Parks District master plan	Local governments
Gulf Islands National Seashore, MS, FL	see below	State government agencies
	water taxis, MS barrier islands	Commercial Use Authorization (CUA) permit holders/outfitters
	Escambia	Public transit service provider
Jean Lafitte NHP&P and New Orleans Jazz NHP	Water transportation provided through a CUA	Commercial Use Authorization (CUA) permit holders/outfitters
Jimmy Carter NHS	Sam Shortline Train	State government agencies
	Americus Shuttle (train to park)	Local governments
	RVRC - River Vly Recreation Commission	Metropolitan/Regional planning organization
	Plains/Americus	Chamber of commerce/business improvement district
Mammoth Cave National Park	State of Kentucky - DOT	State government agencies
	Forever Resorts	Concessionaire
	CUA's for Horse and Canoe Liveries	Commercial Use Authorization (CUA) permit holders/outfitters
	Southern Ky IMBA	Other
	Non-Profit	Other
Natchez Trace Parkway - NATR	Law Enforcement	State government agencies
	Law Enforcement	Local governments
	Multi-use Trail Maintenance	Chamber of commerce/business improvement district
	Partnership to evaluate user experience on Parkway bikes/motorist	Bike share group
	Partnership to evaluate user experience on Parkway bikes/motorist	Park "Friends" group
	BISO	Other NPS units

Unit	Partnership	Type of Partnership
Obed Wild & Scenic River	TDOT	State government agencies
	Morgan	Local governments
	BSFSRR	Concessionaire
(TIMU) Timucuan Ecological and Historic Preserve	Partnership with Ft. George Island	State government agencies
	Timucuan Trail	Local governments
	City of Jacksonville	Metropolitan/Regional planning organization
	Boat Tour pending	Concessionaire
	Timucuan Trails Park Foundation	Park "Friends" group
	Duval Public Schools	School/education group
Virgin Islands National Park	Taxi Drivers and Boat Captains hold CUAs	Commercial Use Authorization (CUA) permit holders/outfitters
	The park, through the Friends, has a partnership with the schools to provide transportation into the park	School/education group