Intelligent Transportation Systems (ITS) in the NPS:
2005 Baseline Inventory and Preliminary Program Assessment

Photo Courtesy of Frank Corrado, FHWA Eastern Federal Lands Division

January 2006
Final Report

Acknowledgment

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Introduction

At the beginning of the twenty-first century, the National Park Service (NPS) faces a daunting challenge in its mission: to preserve and protect the natural and cultural resources within the nearly 400 national park units while providing transportation systems adequate to accommodate growing visitation—up from 220 million recreation visits in 1980 to more than 277 million in 2002, an increase of more than 25 percent. Because one traditional response—building additional transportation infrastructure—is no longer considered a sustainable or desirable solution to park access, congestion, and environmental problems, meeting this challenge requires careful transportation planning and consideration of new methods and technologies. One such set of technologies, Intelligent Transportation Systems (ITS), represents practical alternatives to building new or expanded roads as the only solution to meeting growing travel demand. NPS has already deployed ITS technologies in several parks; experiences to date indicate that there are many other circumstances under which ITS has the potential to help NPS better manage its transportation systems.

Background

Broadly defined, the term "ITS" refers to a range of communications-based information and electronics technologies. The U.S. Department of Transportation (U.S. DOT) classifies ITS into 16 categories, divided generally into "intelligent infrastructure" systems and "intelligent vehicle" systems.

Certain ITS technologies, such as Highway Advisory Radio (HAR, or in NPS parlance, Park Information Radio), have been in place at parks and other recreational sites for many years. More recently, advances in technology and lowering of cost barriers have created new opportunities to utilize ITS technologies for a variety of means: to effectively monitor and respond to traffic, travel, weather, and emergency conditions; to electronically collect fees, fares, and tolls; to gather and process transportation data for informed decision-making.

Beginning as early as 1999, park applications of ITS technologies were discussed at the "National Parks Transportation Alternatives and Advanced Technology for the 21st Century" conference, held in Big Sky, Montana. In 2001, the Section 3039 study, mandated by TEA-21, was completed and it included an initial attempt to identify ITS needs within national parks. Also in 2001, the U.S. D OT Volpe Center prepared a report on "The State of Intelligent Transportation Systems in the National Park System" for the NPS. This document was provided as background material for participants at the "National Workshop to Develop an Intelligent Transportation Systems Program Strategy for the National Park Service," held at the Central Federal Lands Highway Division office in Lakewood, Colorado, on June 29, 2001. Workshop proceedings and programmatic strategy recommendations were summarized in an August 2002 follow-on document produced by the Volpe Center, "Intelligent Transportation Systems Program Strategy: Recommendations to the National Park Service."

Since that time ITS technologies increasingly are being incorporated in transportation infrastructure and in vehicles to improve park transportation system performance and to provide new or improved services. As of the summer of 2005, NPS is continuing to work with the Federal Lands Highway Program (FLHP), the Volpe Center, and its other partners to determine the need for a more structured ITS program within the NPS.

Purpose of this document

Primarily this document provides an updated baseline inventory of the current status of Intelligent Transportation Systems (ITS) within the 388 park units managed by the National Park Service (NPS). The main body of the report includes a baseline summary, discusses the potential of ITS applications to address the unique transportation challenges faced by NPS, outlines prospective research activities to

further develop the understanding of the potential for ITS to meet NPS transportation needs, and suggests programmatic strategies. The baseline inventory of ITS covering 59 park units is included in full in an Appendix.

As a baseline, of current ITS activities within NPS, this document updates the 2001 *Report on the State of the Intelligent Transportation Systems in the National Park System,* which was commissioned by NPS and prepared by the U.S. D OT John A. Volpe National Transportation Systems Center (Volpe Center). In that previous attempt to characterize the "state of ITS," Volpe Center staff reviewed the "Study of Transit Needs in National Parks and Related Public Lands," mandated by Section 3039 of the 1998 Transportation Equity Act for the 21st Century (TEA-21). The "3039" study contains references to ITS and demonstrated that both NPS and the U.S. Department of Transportation are beginning to pursue ITS as a viable, feasible solution to some of the transportation challenges at parks and other recreational/tourist destinations. The current effort supplements the 2001 report by reviewing Project Management Information System (PMIS) entries to identify ITS planning and implementation activities.

This current report was issued in draft form in January 2006, pending review and input from FHWA. The data and information have not changed since the 2006 draft; however, there have been some adjustments in the nature and emphasis of the program assessment.

The report characterizes the state of ITS within NPS as of 2005, outlines additional benefits of ITS within the national park system, and provides a basis for assessing whether a service-wide program strategy for NPS use of ITS is necessary and feasible.

NPS transportation concerns

National parks have many transportation problems as outlined below. Many stem from seasonal surges in park visitation; however, some are systemic. It is important that NPS finds solutions to its problems not only in order to enable maximum visitor enjoyment, but to remove impediments to resource-preservation efforts.

Overcrowding

Especially at some of the more popular destinations, including parks located within crowded urban settings, accessibility to parks and mobility within parks have become major problems that impact the visitor experience and can discourage visitation, tourism, and public support. Many parks are particularly crowded during peak seasons and special events, when visitation (often greatly) exceeds the carrying capacity of the park site during a particular week or at a certain time of day.

Congestion

Seasonal traffic jams in the heavily visited parks limit the ability of visitors to access park resources and can result in a frustrating "parking" experience rather than a relaxing "parkway" experience. In peak traffic periods, parks that collect entrance fees often are faced with long queues, as visitors wait in line at the attendant gates. Additionally, air quality suffers as a result of increased vehicle emissions due to traffic congestion.

Parking Problems

As visitation increases, parking lots fill, prompting some visitors to create impromptu parking areas that can result in damage to sensitive park resources unless staff are diverted from their other duties to direct traffic. Tour and school-bus parking are also significant problems at many parks, as is the need to ensure adequate accessible parking.

Lack of Traveler Information

Timely and accurate information often is not available to travelers to allow them to make informed decisions based on park traffic and road conditions, weather-related delays, facility closures, parking and/or lodging shortages, and available alternative transportation options. The considerable distance over which this information must often be broadcast is also a problem. When traveler information is provided, it is usually targeted to a specific geographic area, even though park visitors can begin their journey to a park from far outside that area.

Public Safety

The ability to locate and assess incidents and provide timely emergency response services is crucial, particularly in remote locations. From a transportation perspective, public-safety needs exist in parks that have the potential for vehicle (car, bus, train, ferry, aircraft, and bicycle) and pedestrian accidents.

Resource Protection

Transportation negatively impacts natural resources in several ways: vehicular exhaust emissions, traffic noise intrusion on the natural quiet and wildlife, vegetation damage from unauthorized parking, wildlife injuries and deaths, fragmentation of habits, and the parkland required for roadway and parking area construction and operations generally.

Why Intelligent Transportation Systems?

The dual nature of the NPS mission—protecting resources while enabling public access—requires a careful balance. On the one hand, the transportation impacts of high visitation can degrade natural and cultural resources; on the other, strong emphasis on resource protection could indicate restrictions on park visitor access. This, coupled with a strong NPS interest, in non-construction alternatives for accommodating growing visitation and in providing easy to use transit alternatives to accommodate visitor mobility needs, is stimulating growing interest in ITS.

Increasingly, ITS technologies are being incorporated in park transportation infrastructure and in vehicles to improve transportation system performance and to provide new or improved services. Several different applications of ITS technologies seem to hold particular promise with regard to national parks.

Advanced Traveler Information Systems (ATIS)

Photos from Paul Bignardi, Golden Gate National Recreation Area

Traveler information systems can be used to keep travelers informed of traffic congestion, incidents, parking availability, weather and other travel conditions, and park restrictions or special events. In addition to informing travelers of the travel conditions, traveler information systems may

be used direct visitors to less crowded roads, park entrances or attractions, and parking areas. By allowing visitors to make better decisions regarding their park visit, ITS can help to balance the flow of visitors on routes to and within parks, and to "even out" visitation among park sites.

Advanced Public Transportation Systems (APTS)

Electronic Departure Display, Acadia Visitor Center
(Photo by Carol Zimmerman, Battelle)

APTS encompasses applications that aid in the more efficient or effective operation of transit systems. APTS often involves the use of vehicle location technology, on-board information systems, on-board or curbside sensors, and computer-aided dispatch and scheduling systems. In parks, APTS can help ensure schedule adherence, reduce wait times at transfer points, offer safer navigation through mixed traffic and fewer accidents between transit vehicles and pedestrians, animals, or other vehicles. Acadia National Park was selected as the site of a national ITS Field Operational Test. The Island Explorer bus fleet is tracked using satellite navigation so that visitors and transit managers can know the location of the buses and when buses will be arriving at a particular transit stop. The fleet also has on-board passenger counters so that ridership can be tracked and service levels adjusted accordingly on a frequent basis – an important capability in national parks where visitors and park usage patterns can vary from week to week and from month-month during the peak season.

Parking Management Systems
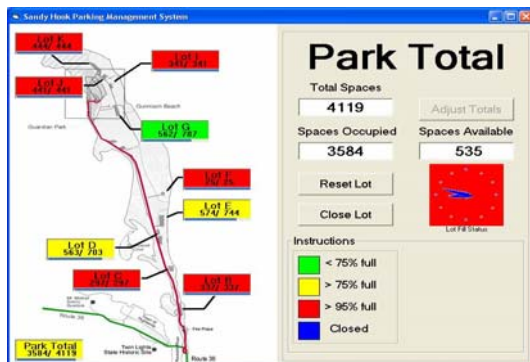
Sandy Hook Parking Management, USDOT Volpe Center

Parking management systems monitor the availability of spaces at parking facilities. Often parking management information is used to encourage visitors to seek other parking destinations, use alternative transportation or both. Acadia National Park and the Sandy Hook Unit of Gateway National Recreation Area pioneered the use of parking management systems. The Sandy Hook system monitors parking in nine beach parking areas, to provide an indication of the park ability to accommodate visitors overall. The system features a parking forecast capability to alert park managers thirty minutes in advance of when parking areas are expected to be full, so that visitors en-route to the park can be notified that the beach parking areas are full. The system also captures and archives usage data for each parking area for park operations management and planning purposes.

Electronic Entrance and Fee Payment Systems

Automating entrance fee payment using toll-tag, magnetic stripe, or smart-card technology can greatly reduce queuing problems, and can provide for more flexible and more convenient payment methods for both a park and its visitors. To the extent that electronic payment is consistently integrated across all available visitor transportation services, visitors can have the convenience of a seamless payment mechanism.

At Rocky Mountain National Park, visitors that have either a Rocky Mountain Park pass or a National Park Pass can enter the park through an automated lane by just swiping their pass through a card reader. In addition, such ITS technology can provide information about park usage and visitation patterns, whether an entrance fee is collected or not.

Photo by Roger Surdahl, FHWA Central Federal Lands Div.

Incident Management Systems

An incident is any occurrence that disrupts the safe, efficient operation of transportation: fallen debris on the roadway, a medical emergency aboard a vehicle, a broken-down vehicle blocking traffic, flooding or other natural disasters, or even wildlife viewing. "Bear Jams" is a term used by park rangers to characterize traffic congestion in national parks resulting from wildlife viewing by park visitors. The "jam" occurs as visitors pull off on both sides of narrow park roads to view wildlife, thereby restricting the passage of large recreational vehicles in particular. Through traffic monitoring, early incident detection, assessment and rapid response, efficient operation of transportation systems can be effectively managed.

Cumberland Gap Tunnel Control Center (NPS Photo)

Wildlife Crossing Protection

Vehicle collisions with large mammals are a serious and growing concern in many rural areas, and in particular national parks where the value of wildlife is paramount not only in preservation of park resources but in terms of providing a safe, high quality visitor experience. Each year animal-vehicle collisions claim the lives of over 200 people and injure 29,000 people, in addition to killing millions of animals.[1] ITS applications to prevent wildlife crossing collisions are undergoing test and evaluation in several areas. One such evaluation is on Route 191 near the west entrance of Yellowstone National Park, where a roadside sign flashes warnings to drivers when animals step onto the roadway. Section 119 of the recently enacted Federal transportation bill, named SAFETEA-LU, calls for a national study of methods to reduce wildlife-vehicle collisions.

A bull moose crosses Route 3 in Twin Mountain, NH. (Photo by Tom Roy / Manchester Union Leader)

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[1] Road Ecology, Richard T. T. Forman and Daniel Sperling, et al., 2003 p.117

Vehicle Emissions Monitoring

Photo by VTT Technical Research Centre of Finland

Vehicle emission monitoring is included as part of the National ITS Architecture, but most often deployed as a stand alone application by environmental regulatory organizations rather than by transportation agencies. Although both mobile and fixed technology exists for monitoring tailpipe emissions from passing vehicles, accuracy varies. However, such devices can be used for roadside screening of "gross polluting" vehicles, which can be useful in that over 90% of the emissions can result from as few as 10% of the vehicles in a traffic stream.

2005 Baseline of ITS in National Parks

Recognizing a possible need to address ITS more explicitly within its transportation programs, the NPS initiated efforts with the FHWA Federal Lands Highway (FLH) Office, the Volpe Center, and other partners to assess its needs and possibly develop a structured framework for NPS ITS activities. An initial step in the effort is to conduct a baseline assessment of ITS projects in national parks as a means to assess the range and extent of prevailing park interests in ITS applications. Table 1 provides an overview of the initial ITS baseline assessment findings for 40 of the 59 park units included in the full inventory. Most of the parks not specifically included in Table 1 are part of a 15 unit National Parks of Massachusetts cluster.

Table 1: Summary Baseline of ITS in the National Park System (Grouped by NPS Region)

Symbol Key:
- ○ Identified Need or System Plan
- ◐ Implementation Planning or Design
- ● Essentially Complete or Complete

Region	Park	Automated Entry System	511 System Integration	Highway Advisory Radio	Incident Management System	Parking Management/Availability	Reservation Systems	Traffic Monitoring System	Travel Information--unspecified	Travel Information Kiosks	Trip Planning tools	Variable/Changeable Message Signs	Weather/Road Condition Information	Fleet Management	In-Vehicle Electronic Information	Transit Management	Vehicle Tracking System	Road Construction Information	Work Zone Management	Integrate ITS with state / local DOTs	ITS Needs Assessment
Intermountain	Arches National Park	○	◐	◐		◐	◐				◐										●
Intermountain	Bryce Canyon National Park	●	○		◐					●						◐				○	
Intermountain	Glacier National Park		○	○	○			○	○	○	○	○	○		○	○	○	○	○	○	●
Intermountain	Grand Canyon National Park	○	●	●		○	○			○	○	○									
Intermountain	Grand Teton National Park	◐		◐		◐	◐			◐	◐	◐									●
Intermountain	Petrified Forest National Park			●																	
Intermountain	Rocky Mountain National Park	●																			
Intermountain	Yellowstone National Park	●	◐	●						◐		●	◐								●
Intermountain	Zion National Park	●	○									◐									◐
Midwest	Sleeping Bear Dunes National Lakeshore					○			○												
National Capital	Baltimore-Washington Parkway							◐													
National Capital	George Washington Memorial Parkway							◐				○						○	○	○	
National Capital	National Mall & Memorial Parks				●			○	○		○										◐

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Region	Park	Automated Entry System	511 System Integration	Highway Advisory Radio	Incident Management System	Parking Management/Availability	Reservation Systems	Traffic Monitoring System	Travel Information–unspecified	Travel Information Kiosks	Trip Planning tools	Variable/Changeable Message Signs	Weather/Road Condition Information	Fleet Management	In-Vehicle Electronic Information	Transit Management	Vehicle Tracking System	Road Construction Information	Work Zone Management	Integrate ITS with state / local DOTs	ITS Needs Assessment
								Travel & Traffic Management						Public Transportation Management				Maintenance & Construction Management		General/Other	
Northeast	Acadia National Park		●	●		●	◐			●	◐	●		●	●	●	●	◐		◐	●
	Allegheny Portage Railroad National Historic Site	○	●																		●
	Blackstone River Valley National Heritage Corridor			●					◐												◐
	Boston Harbor Islands NRA									○											
	Boston National Historical Park									○											
	Cape Cod National Seashore			○		○		○	○	○		◐				◐	◐			◐	●
	Gateway National Recreational Area	◐		●		●						●									●
	Gettysburg National Military Park								○					○							
	National Parks of Massachusetts					○					○	●									
	Shenandoah National Park		○										○							○	○
	Statue of Liberty National Monument									◐											◐
Pacific West	Golden Gate National Recreation Area		●	◐		○		◐	◐		◐	●	◐			◐				◐	●
	Lewis & Clark NHP			●	●					●		●								○	
	Mount Rainier National Park			●		○			○				○							○	◐
	Mount Saint Helens National Volcanic Monument								◐												
	Olympic National Park			●					◐								◐			○	●
	Redwood National & State Parks											●	●							○	
	Santa Monica Mountains National Recreation Area								●		●										
	Sequoia and Kings Canyon National Park	○		●		○						○	○	○							●
	Yosemite National Park		○	●			○	◐	◐			●	◐	●						●	◐
Southeast	Blue Ridge Parkway		○																	○	
	Cape Hatteras National Seashore											●								●	
	Cape Canaveral National Seashore																				○
	Cumberland Gap National Park			●	●			●				●	●								
	Great Smoky Mountains National Park		○	●	○	○					○	●	○		○		○		○	○	●
	Gulf Islands National Seashore				●	●						●									
	Natchez Trace Parkway									●	●										

Methodology

The Volpe Center developed an inventory of various programs, projects and applications within the NPS that focus on or contain components of ITS. The inventory of ITS activities was compiled by identifying potential ITS components of transportation projects within the NPS Project Management Information System (PMIS), as well as park projects listed under the Federal Lands Highway Program (FLHP) and the U.S. D OT ITS Joint Program Office. In addition, the Volpe Center contacted NPS regional transportation planning staff and FHWA Federal Lands Highway Division staff to obtain information on projects, and to confirm the breadth and depth of the projects identified in the initial review. Volpe Center researchers also reviewed park transportation plans and study reports to discern what ITS elements are planned or being considered in some way.

Much of the reported information is based on the subjective interpretation of the stated definition of ITS by various NPS and FHWA staff members. In addition, park ITS interests may be underreported for those projects in the conceptual or pre-conceptual phases pending the identification of an eligible fund source. It is important to note that although FLHP funds may be used for most ITS applications, the NPS until FY 2006 restricted the use of its FLHP funds to ITS applications that are integral to alternative transportation systems − reflecting its commitment to reducing the backlog of road and parkway repair and rehabilitation needs. Thus, the ITS baseline probably reflects a bias toward travel information uses and parks that have existing or planned alternative transportation systems. The baseline inventory reflects data from February 2005 through December 2005.

Prevailing ITS Interests and Applications in National Parks

Several of the large western parks were among the first "early adopters" of ITS within NPS. Yosemite National Park and Yellowstone National Park are located in or nearby states that have proactive ITS programs. Sequoia and Kings Canyon National Parks and Golden Gate National Recreation Area have benefited from efforts by the California Department of Transportation (Caltrans) initiative to include national parks in its ITS needs assessment activities. The Caltrans sponsored study, "Assessing Needs and Identifying Opportunities for ITS Applications in California's National Parks" conducted by the Western Transportation Institute (WTI) of Montana State University's College of Engineering helped stimulate awareness and interest in ITS within the NPS, which also has benefited from presentations, workshops, and other reference materials on ITS applications.

Various ITS applications are utilized by a wide range of park types: suburban and rural parks, small and large parks, scenic seashores and regional parkways. ITS contributes to visitor enjoyment in various ways: by allowing pass holders to bypass long queues at entrance gates, by providing travelers with information on weather and roadway conditions, by notifying transit riders of routes and vehicle arrival times, and by helping drivers to determine where to park their cars. ITS also helps park staff to better serve visitors by automating advisory information reports, monitoring weather conditions, counting traffic and visitation, and tracking vehicle maintenance. Acadia National Park in Maine was selected by the NPS and U.S. D OT as a Field Operational Test site to evaluate the effectiveness of ITS applications in a park setting. The test included enhancements to Acadia's "Island Explorer" visitor transit system, a park parking management system, and improved highway advisory radio system.

ITS in Urban Parks

About a third of the ITS initiatives in national parks are related to urban parks. Most national parks in urban areas are considering ITS traveler information applications (such as the web-based trip planner for the national parks of Massachusetts, shown in Figure 1, below, that was implemented as a collaborative effort among 15 national park sites) yet not transitioned as part of the NPS.gov website redesign in 2006. Traffic congestion management strategies and parking management systems frequently are included as

well. Half of the projects in baseline inventory are in the conceptual or planning phase, with the other half split almost evenly between implementation and completion.

FIGURE 1 National Parks of Massachusetts web-based trip planner.

U.S. DOT Volpe Center (http://www.nps.gov/applications/state/ma/trip_planner.cfm)

ITS in Rural Parks

Rural parks often struggle with the transportation problems of rural areas, but also may have very different issues to address within the park boundary. Rural parks also tend to be larger and more remote, often increasing the challenges and/or costs of infrastructure even further as electrical power and telecommunications infrastructure to support ITS deployment is limited. In rural parks, advanced traveler information systems (such as the interactive voice response system at Arches National Park or the electronic shuttle bus information display at Acadia National Park, parking management systems, and automated entry systems (such as automated entry bypass lane at Rocky Mountain National Park and

Bryce Canyon National Park), are frequently utilized ITS applications. In addition, major parks that have alternative transportation systems also utilize transit management systems. Half of the projects at rural parks listed in Table 1 are in the implementation stage, with almost as many in the planning stage. A small number are in the conceptual phase.

ITS and Parkways

The baseline inventory also identified several parkways that are planning or undertaking ITS applications:

- Natchez Trace Parkway, which crosses Alabama, Mississippi and Tennessee;
- George Washington Memorial Parkway, in Virginia, and
- Baltimore-Washington Parkway, in Maryland and the District of Columbia.

Travel information is a common application in these park units. The Natchez Trace installed seven Traffic Information Stations over a nine-year period. Initially, the George Washington Parkway implemented a safety-focused traffic speed monitoring and enforcement system on a trial basis in cooperation with the National Highway Traffic Administration, but discontinued it soon thereafter following an adverse public reaction. However, the parkway, in association with FHWA FLH Eastern Division and in cooperation with the Virginia Department of Transportation, now intends to utilize ITS to keep travelers informed of traffic conditions and incidents along the parkway during upcoming road repair and reconstruction activities.

Prevalent ITS Applications in National Parks

Traveler information, in various forms, is the most prevalent type of ITS application at national parks. Trip planning tools (such as the web-based trip planner shown in Figure 1, above) and variable message signs are both popular, as are parking management systems and weather-condition monitoring systems. Parks also use automated entry systems, and to a lesser extent emergency management systems (such as road-closure or work-zone information systems). In addition, a number of park units have proposed or are conducting ITS needs assessments; many of these parks hope to implement travel information systems, parking management systems, and road-based management systems. A summary overview of ITS in national parks is presented in Figure 2, below. Beyond traveler information and abundant partnering, the baseline inventory does not indicate that there are a few ITS applications that would be of sufficient interest most parks to warrant a service-wide initiative, with the possible exception of parking monitoring and management.

ITS Scope and Cost

The scope and scale of ITS varies as widely as do ITS applications. There are comprehensive efforts—units where projects and applications are part of a fully-formed mid- to long-range plan—that consider the improvement of all systems and include ITS as one of many ways to address their various issues. These are the parks, such as Acadia National Park, Arches National Park, Glacier National Park, Great Smoky Mountains National Park and Yellowstone National Park that benefit from significant involvement and assistance from local, regional, and national organizations. These parks have adopted traveler information systems, implemented intelligent transit systems, and more.

Some parks have undertaken ITS efforts as part of a plan, but the plan, rather than being comprehensive, is devised, adopted, and implemented in an incremental manner. Long-term goals may exist, but the execution, and in some instances even the plan, is more piecemeal. Such parks include the Gateway National Recreation Area (Sandy Hook Unit) and Rocky Mountain National Park. Projects might include a traveler information system, a parking management system, and an automated entry gate, where each system or project is installed separately even though it is part of a larger plan.

FIGURE 2 ITS Technologies and Applications
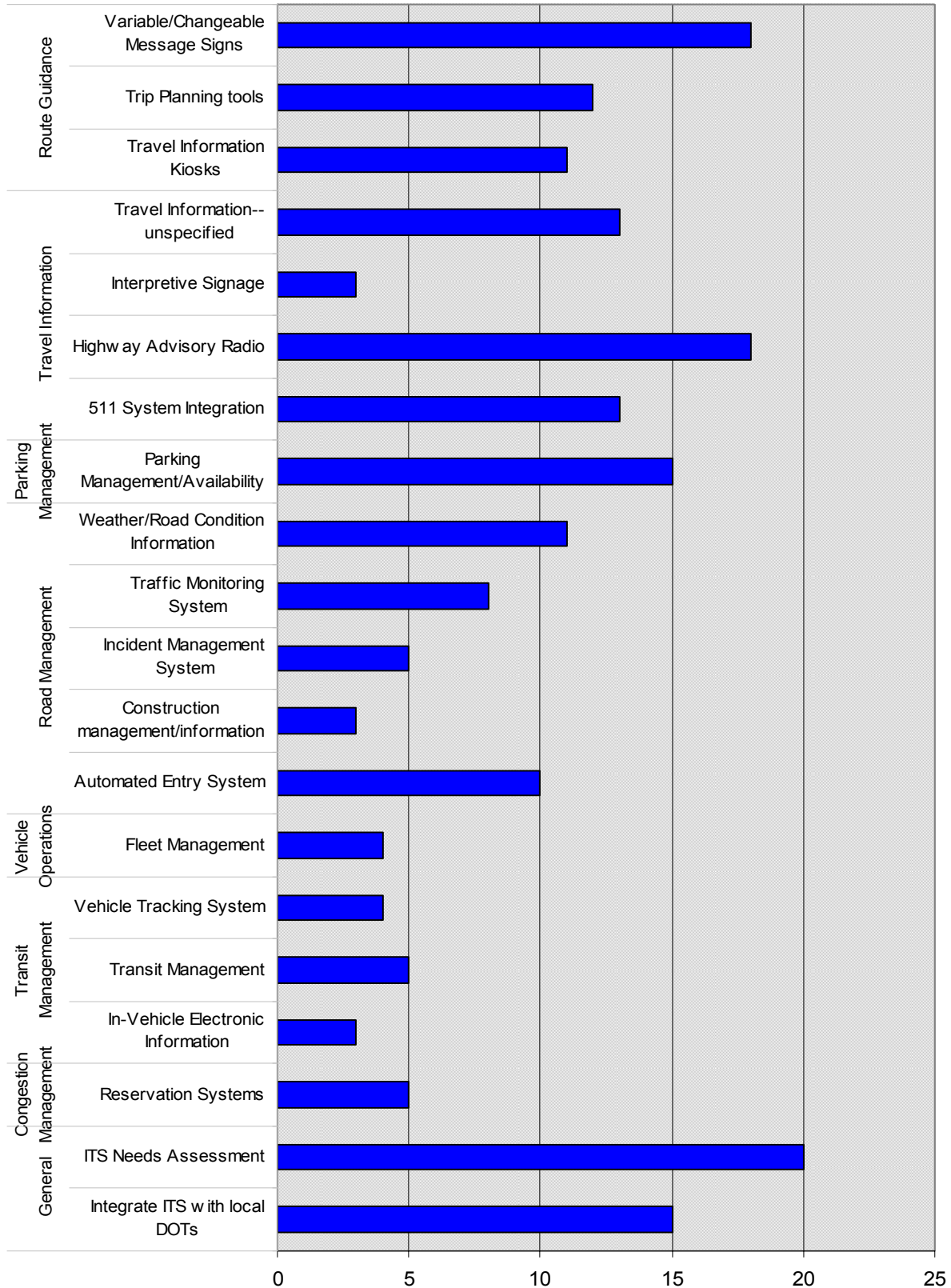
There are also parks that adopt ITS as needed. There may be recognition that a plan might be useful, but ITS projects are conceptualized, planned, and deployed on an individual basis. These parks tend to add ITS components to specific items as they install or upgrade them. In many cases, these parks are simply making smart decisions when modernizing and upgrading transportation facilities, such as adding a tunnel operation and control system at Cumberland Gap National Historical Park.

Spending on ITS applications varies greatly depending on the type of application, its purpose, the area covered by the application, the availability, and compatibility of existing infrastructure and systems, and the process for deployment. Most ITS projects are modest in scope and cost. For example, a simple ITS installation comprising a simple portable dynamic message sign on an approach road to a national park entry station could require as little as $25,000, while a more comprehensive implementation involving a traveler information website with highway advisory radios and an array of variable message signs covering several approach roads, entrances, and real-time monitoring of parking areas would cost much more. A comprehensive ITS effort can cost between one and three million dollars. The initial budget for the ITS field operational test at Acadia National Park was about $2 million, and grew beyond that as a result of a number of unforeseen implementation problems. ITS deployment at Glacier National Park planned as a construction mitigation measure during an 8-year reconstruction of the Going-to-the-Sun Road (Figure 3 below) is on the order of $1.3 million. Similarly, the cost of developing and operating a traffic monitoring and management can be significant. For example, the real-time traffic and tunnel operations monitoring system developed as part of the Cumberland Gap Tunnel was essential to ensure traffic safety. Although the ITS related costs were very substantial, these represent a small fraction (i.e., under 5%) of the $280 million cost for the tunnel project overall.

FIGURE 3 Glacier National Park ITS Plan Overview
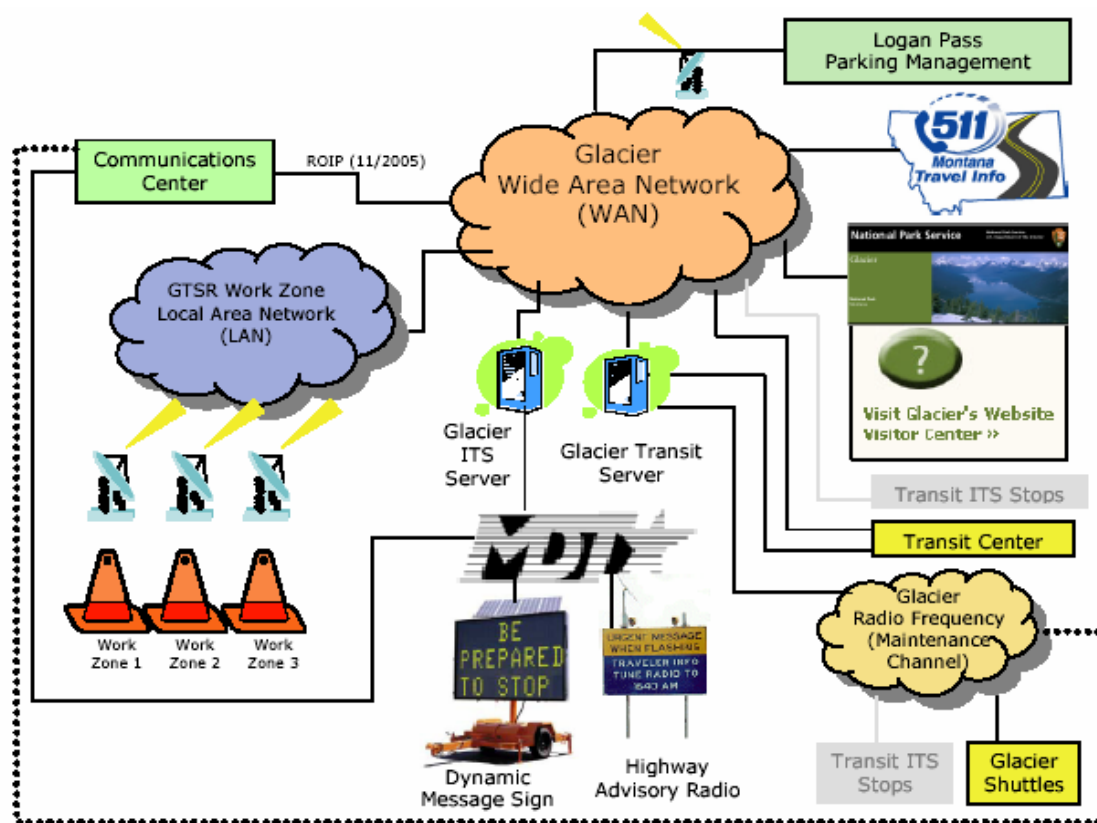
Glacier National Park Intelligent Transportation Systems Plan, May 2005

Typically, adding ITS features to roadway or transit system represents less than 5% of the cost of the facility or system itself. Guidance on ITS costs is available through the evaluation section of the National ITS Architecture (http://www.iteris.com/itsarch/html/menu/documents.htm). The systems and packages that address various problems and ITS solutions are each clearly categorized. Some understanding of the National ITS Architecture is required, however, as much of the cost information is grouped according to the subsystem of each component, rather than the service or application. The ITS Architecture Subsystems associated with ITS applications in national parks are noted in the full baseline inventory.

Status of National Park ITS Planning and Implantation

In 2001, 19 national park units were using or planning to use ITS technologies or applications. In 2005, at least 35 parks are utilizing or contemplating some type of ITS application. Intended uses range from fairly simple variable message signs and automated entry gates to more complex road and transit monitoring systems. Only about 11 percent of the projects in the ITS baseline inventory have been fully completed. Of the remainder, many are smaller, foundational ITS projects that represent the initial components of larger, more comprehensive programs. As shown in Figure 4, about a quarter of the ITS project baseline is now in the process of being designed or implemented, whereas two-thirds remains in the concept and project planning phases.

FIGURE 4 ITS Projects by Phase of Development
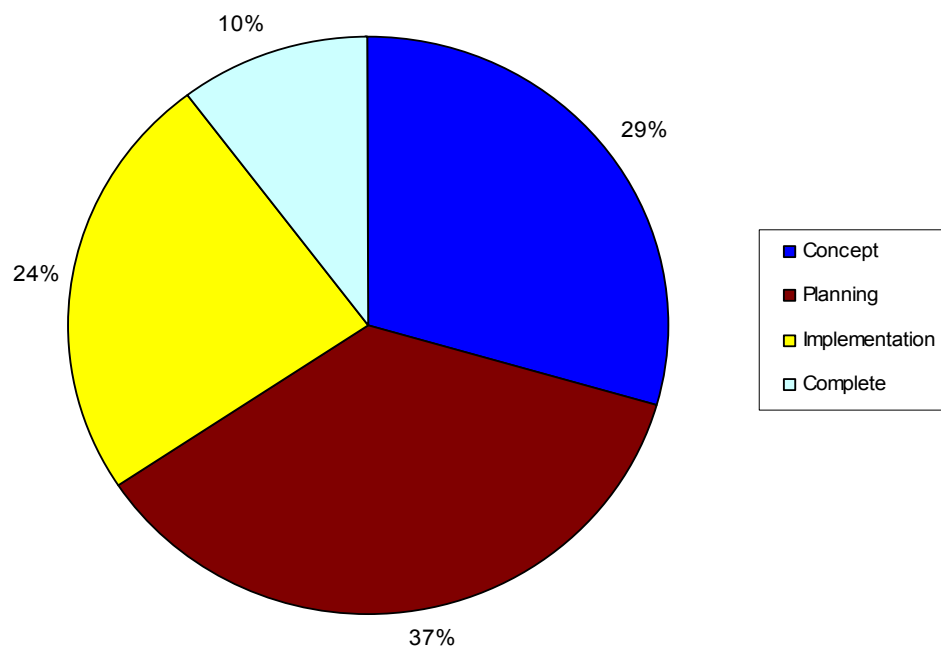
ITS Coordination and Partnering

In considering additional ITS deployments and the creation of a national ITS program, the NPS has the opportunity to coordinate with other current ITS activities and initiatives. As shown in Figure 3, many NPS ITS initiatives involve state and local transportation agencies as partners. California, for instance, is undertaking an ambitious effort to plan deploy ITS services throughout the state and, and has identified a cross-section of tourist destinations in their efforts, including national parks. Similarly, the Massachusetts

Highway Department identified national parks as a key stakeholder when it was developing Regional ITS Architectures for various portions of the Commonwealth, and in doing so is building upon a partnership among the Cape Cod National Seashore, the Cape Cod Commission and the Cape Cod Regional Transit Authority to further cooperative ITS deployment in Southeastern Massachusetts. Maine DOT, Utah DOT and Washington State DOT each have reached out to national parks as part of state efforts to provide ITS traveler information in travel corridors leading to and from major tourist destinations. Thus, these states are ranked among the top states with the most ITS projects in national parks, as shown in Figure 5, below.

FIGURE 5 NPS ITS Projects by State
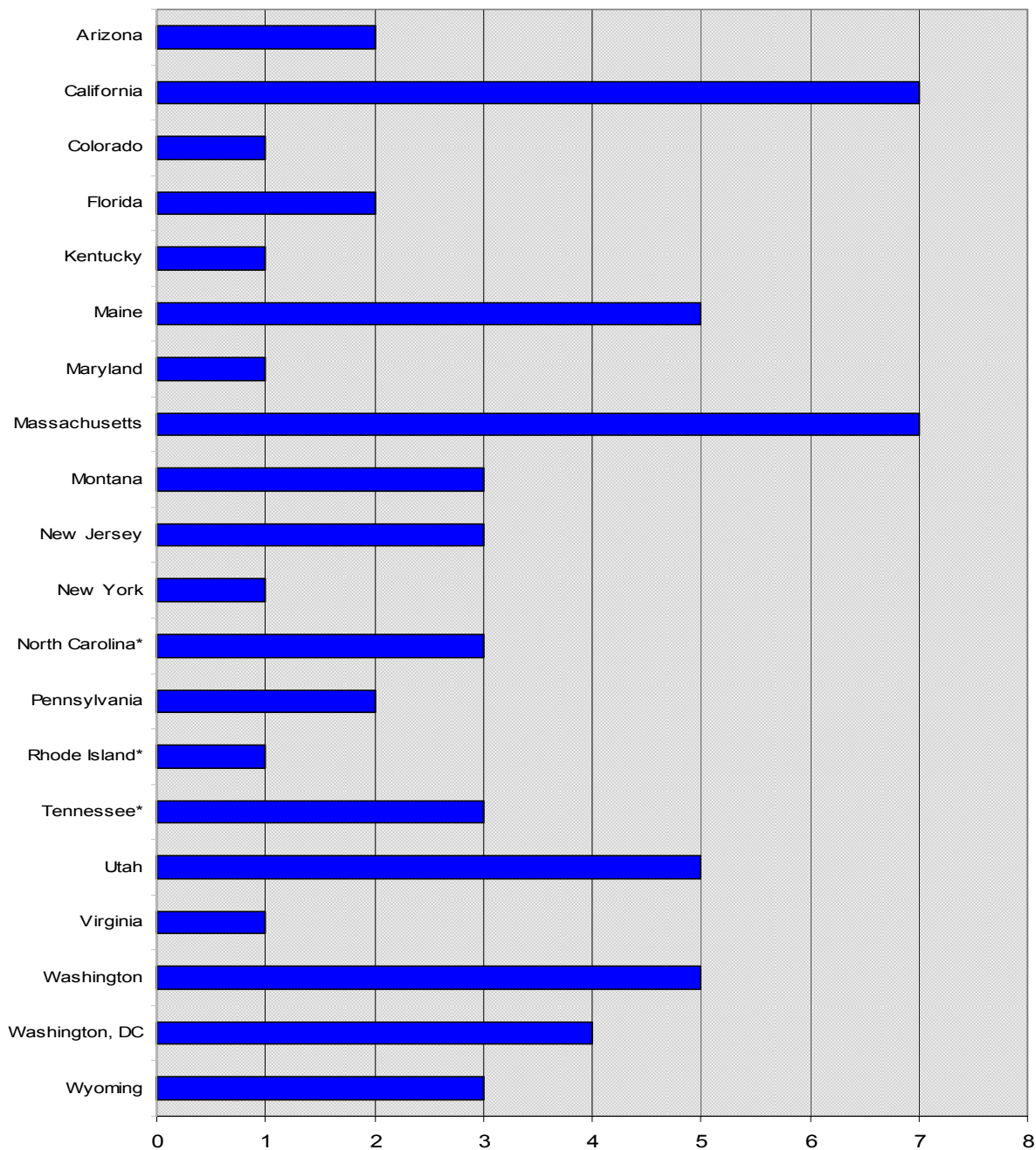
Many of the successes in ITS deployment have had significant help from regional transportation agencies and, in the case of several western and central parks, from academic institutions. Though not entirely new to NPS, the application of ITS in a comprehensive manner is not widely practiced. By collaborating with agencies that are pursuing the widespread application of ITS, park units will increase their chances of utilizing the appropriate variety of components and systems, as well as understanding the best practices in the field.

Collaboration with park gateway communities also has helped many ITS projects gain success. Not only does collaboration help to increase the knowledge base for many projects, it also helps to build support for the project and widen the sphere of possible funding. Projects endorsed by community stakeholders have been successful in obtaining the support and sometimes the financial assistance of local businesses and grant-making organizations (as was the case with the Natchez Trace variable-message sign system).

In considering future ITS deployments and the creation of a national ITS program, the NPS has the opportunity to coordinate with other current ITS activities and initiatives. Among the most promising opportunities involve participating in state and are regional ITS architecture and "511 – America's Traveler Information Telephone Number" initiatives. Notably, some parks have pioneered such activities. Grand Canyon National Park, for example, participated in the 1997 Early ITS Deployment Plan for I-40 that included a regional architecture, and it has been included in the Arizona 511 system since its inception.

National ITS Architecture

The "National ITS Architecture" provide a common framework for planning, defining, and integrating ITS. The National ITS Architecture defines the functions, categories and data required for various types of intelligent transportation systems in a way that allows different agencies, vendors, and other organizations to relate to each other for effective planning.

FIGURE 6 Statewide and Regional ITS Architecture Development
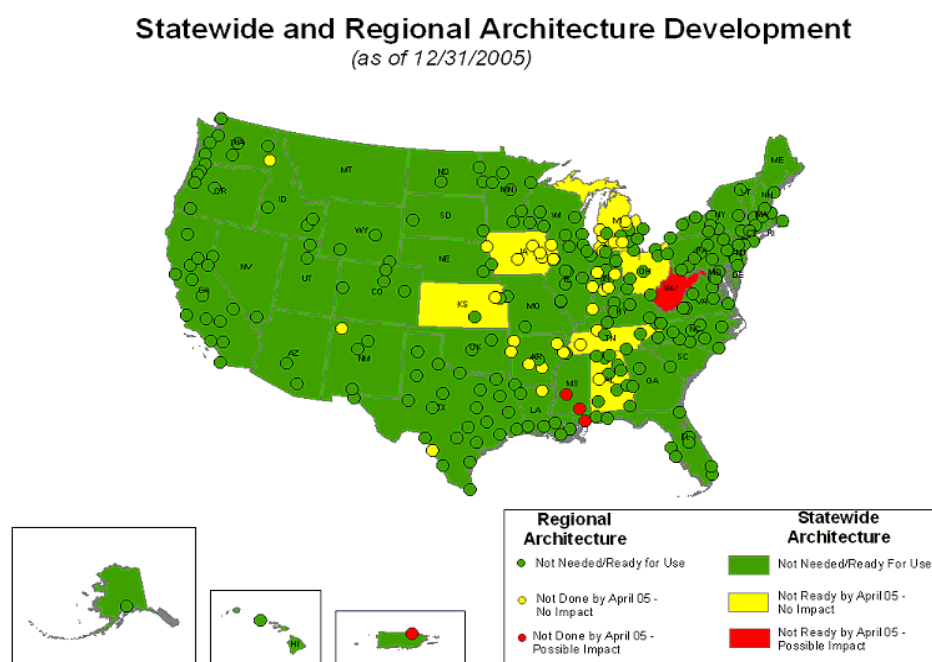
Federal Highway Administration. http://www.ops.fhwa.dot.gov/its_arch_imp/regarch_map.htm

Table 2 National Park Inclusions in Statewide and Regional ITS Architectures (as of September 2005)

Region	State	Park Name	Architecture Name	Inclusion
Intermountain	AZ	Grand Canyon National Park	I-40 ITS Corridor	Project
Intermountain	CO	Rocky Mountain National Park	Colorado Region 4 ITS Architecture	Unknown
Intermountain	MT	Glacier National Park	Montana DOT Statewide	Project
Intermountain	MT, WY, ID	Yellowstone National Park	Greater Yellowstone ITS Priority Corridor	Reportedly
Intermountain	UT	Arches National Park	Utah Statewide ITS Architecture	Unknown
Intermountain	UT	Bryce Canyon National Park	Utah Statewide ITS Architecture	Unknown
Intermountain	UT	Zion National Park	Utah Statewide ITS Architecture	Unknown
NMMP	DC	George Washington Memorial Parkway	DC CapWIN/CapCOM	Reportedly
NMMP	DC	National Mall & Memorial Parks	DC CapWIN/CapCOM	Reportedly
NMMP	MD	Baltimore-Washington Parkway	CHART	Reportedly
Northeast	MA	Northeast Regional Office	Boston area ITS architecture	Reportedly
Northeast	MA, RI	Blackstone River Valley National Heritage Corridor	SE Massachusetts	Reportedly
Northeast	MA, RI	Cape Cod National Sea Shore	SE Massachusetts	Reportedly
Northeast	ME	Acadia National Park	Maine Statewide ITS Architecture	Reportedly
Northeast	NJ	Gateway National Recreation Area	New York/New Jersey TransCOM	Unknown
Northeast	NY, NJ	Statue of Liberty National Monument	New York/New Jersey TransCOM	Unknown
Northeast	PA	Allegheny Portage Railroad National Historic Site	PennDOT District 2 ITS Architecture	Unknown
Northeast	PA	Gettysburg National Military Park		Unknown
Northeast	TN	Great Smoky Mountains National Park	Knoxville Regional ITS Architecture	Reportedly
Northeast	VA	Shenandoah National Park	NOVA ITS Architecture	Reportedly
Pacific West	CA	Golden Gate National Recreation Area	Bay Area Regional ITS Architecture	Reportedly
Pacific West	CA	Redwood National and State Parks		Unknown
Pacific West	CA	Santa Monica Mountains National Recreation Area		Unknown
Pacific West	CA	Sequoia & Kings Canyon National Park		Unknown
Pacific West	CA	Yosemite National Park		Unknown
Pacific West	OR	Lewis & Clark National Historical Park*	Oregon Regional ITS Integration Program	Project
Pacific West	WA	Mount Rainier National Park	Puget Sound Regional ITS Architecture	Project
Pacific West	WA	Mount Saint Helens National Volcanic Monument		Unknown
Pacific West	WA	Olympic National Park	Puget Sound Regional ITS Architecture	Unknown
Southeast	AL, MS, TN	Natchez Trace Parkway		Unknown
Southeast	FL	Cape Canaveral National Seashore	Florida Statewide ITS Architecture, East Central Florida RPC	Unknown
Southeast	FL	Gulf Islands National Seashore	Pensacola Urban Area ITS	Reportedly
Southeast	KY	Cumberland Gap National Park	US25E ITS Corridor, Kentucky Statewide, Tennessee Statewide	Project

* ITS applications are part of the regional ITS architecture, but not owned or managed by the park. Lewis & Clark NHP collaborates with their partner, Oregon DOT, who owns and manages the systems.

Key	
Reportedly	Inclusion in regional ITS architecture reported by park unit during course of baseline inventory / assessment.
Possibly	Inclusion not reported by park unit, but mentioned during baseline inventory / assessment or discovered during research.
Project	Project-level architecture only.
Unknown	No information reported during inventory/assessment or uncovered during research.
Note: This information is provisional and subject to change based on update, verification and validation efforts.	

In 2001, U.S. D OT issued its "Policy on ITS Architecture and Standards Conformity," which requires that projects carried out using the Highway Trust Fund or Mass Transit Account conform to the National ITS Architecture and applicable standards. This includes ITS funds provided under the FLHP. The policy allows for and recognizes the practicality of having statewide and regional ITS architectures based on the National ITS Architecture that include only the subsystems and functions anticipated for implementation in a given state or regional area, thereby enabling more tailored planning and use of ITS components. The FHWA FLH Office plans to develop specific guidance on how to apply the Policy on ITS Architecture and Standards Conformity in all FLHP funded projects, including those in national parks.

The potential for ITS partnering is high for parks located near where regional ITS efforts are already underway. As of the April 2005 conformity policy deadline, more than 20 states had regional architectures in place, and all but five of the remaining states have begun developing regional architectures. In many cases, cities, metropolitan areas, and counties within those states have already developed architectures specific to their regions.

Clearly, many if not most parks are located in areas covered by statewide or regional ITS architectures prepared by transportation agencies; however, further research is needed to determine precisely whether particular national park ITS interests are appropriately incorporated in these architectures. The FHWA Federal Lands Highways Program has proposed a follow-on effort to identify National ITS Architecture developments in various regions of the country by States, MPOs, or by other transportation agencies that currently do or should involve NPS participation and cooperation so as to consider and reflect ITS needs of national parks. Such an effort would update and validate preliminary information in Table 2 above.

Further, with respect to identified regions, the intent of such a verification and validation effort is:

- to assess the extent of institutional arrangements planned or in place with the NPS for addressing ITS-related transportation issues together with the States or MPOs;

- to evaluate and rank each instance on the basis of NPS needs and opportunities;

- to develop recommendations on appropriate levels and mechanisms for NPS participation in regional architecture development and maintenance.

- to assist in the development of regional architecture elements in instances selected by the NPS.

511 – America's Traveler Information Telephone Number

"511" denotes the national traveler information initiative launched in 2000 when "511" was designated as the nationwide three-digit phone number for providing real-time traveler information by the Federal Communications Commission. Dialing "511," where the service is available, provides travelers with up-to-date information about travel conditions across various transportation modes, such as highway, rail, and transit. Whereas "511" fundamentally is a telephone-based system, information often is delivered via the Internet and/or other means as well. Regardless of varied delivery mechanisms involved, information aids travelers in making choices about when, where, and how to travel. The "511" Deployment Coalition was established to promote and coordinate "511" initiatives across the country. However, states coordinate 511 within their boundaries. The 511" Deployment Coalition membership includes organizations such as U.S. D OT, the American Association of State Highway and Transportation Officials (AASHTO), the American Public Transit Association (APTA), and the Intelligent Transportation Society of America (ITS America).

Several major national park units are participating in state and regional 511 initiatives. In addition to Grand Canyon National Park in Arizona, Acadia National Park in Maine and Golden Gate National Recreation Area in the San Francisco Bay Area are notable for playing active roles. At least nine additional parks have identified traveler information needs for 511 or now are working toward partnering in 511 initiatives. Many other parks have visitor information phone numbers but have yet to determine whether these might be linked to state or regional 511 systems.

Future Prospects for ITS in National Parks

Within national parks, ITS technologies hold promise in alleviating traffic and parking congestion by providing and informing visitors of alternative transportation services, managing traffic demand and emergency incidents, and providing essential park transportation planning and operational data for congestion, safety, security, and asset management needs. Although many parks are already taking advantage of ITS, there are more potential applications.

Only 10% of the baseline inventory of ITS projects for national parks is considered complete; suggesting that there is ample interest and opportunities for applying ITS in parks that have yet to be addressed. It is important to recognize, however, that the correlation between the number of projects and the investment required is imprecise at best given that a project can range from a planning study to the implementation of a comprehensive suite of ITS technologies within a park Also it is important to realize that most projects in the concept or planning phase lack the funding to proceed to implementation. In light of the competing priorities for available NPS transportation funds, it is likely that ITS will continue to evolve slowly and in association with partners and/or as an integral part of roadway or alternative transportation improvement projects.

Leading ITS Prospects

The leading prospects for ITS in the NPS span both the Transportation Management Program (TMP) and the Park Roads and Parkway Program (PRPP). Broadly speaking, Traveler Information is by far the most prevalent use of ITS technology and probably will figure prominently in NPS ITS activities going forward. A service-wide trip planner has been proposed by the NPS.gov Portal Manager, based on survey research that suggests over 50% of the estimated 150 million current NPS website visitors are interested in having trip planning information. Nonetheless, there are significant institutional impediments, not the least of which is austere funding relative to transportation needs within the NPS. Thus documenting the benefits of ITS investment is essential and a top ITS program priority expressly communicated by the NPS FLHP / Service-wide Maintenance Advisory Committee (SMAC) following their October 2005 meeting.

Although beginning in FY2006 certain ITS projects are eligible for PRPP funding, restrictions up to now have resulted in more attention being given to ATS oriented ITS project planning and development. Both TMP and PRPP now have specific ITS funding eligibilities. TMP project development guidance requires that parks consider "non-construction" alternatives, such as ITS, before deciding that new or expanded visitor transportation services are needed. Likewise, the PRPP emphasis on improving the condition of existing roads and parkways effectively squelches road expansion in favor of management strategies when traffic reaches or exceeds roadway capacity and/or parking space. Similarly FHWA regulations that call for the NPS to develop a Congestion Management System, are likely to highlight opportunities for ITS to play a role in roadway and parking congestion management.

Alternative Transportation Systems for park visitor use, including bus, rail, ferry, bike / pedestrian trail systems, exist at over 100 parks nationwide, less than 15 percent of which now use ITS technologies. While not all parks that have an ATS may require ITS, ITS can beneficial to ATS in several different ways. ITS applications might include dynamic in-vehicle route displays, roadside signage detailing vehicle arrival time, and dedicated and/or automated entry / bypass lanes for ATS vehicles. However, the greatest ITS prospects are at parks with comparatively large alternative transportation systems by NPS standards. In such instances the alternative transportation system typically is operated by a concessionaire, contractor or partner – often outside of the main purview of the TMP and/or PRPP.

Based on the experience to date, ITS potential also exists at national parks in or near areas where regional ITS architecture and/or "511" traveler information efforts are already underway. Many of the largest ITS initiatives within parks are done in partnership with state and local transportation agencies. This is likely

to continue in that partners bring specialized ITS expertise and funding – both in short supply within the NPS. Successful partnering, however, requires that NPS representatives be able to engage constructively in planning dialogues with prospective partners to communicate NPS interests and follow-through on any NPS commitments as part of a cooperative endeavor. The availability of up-to-the-minute information on park transportation and operating conditions is a strong factor in attracting partners; however, sometimes even having a park information phone number that can be incorporated into a "511" system can serve as a starting point – provided that a park has sufficient visitation to warrant its inclusion as a travel destination within a given state or region.

Preliminary Program Assessment

The cover of this report is emblematic of ITS in the National Park Service as a work in progress and one that is being adapted to conform to the design sensibilities and operating paradigm of national parks. In this vein, a number of potential ITS programmatic considerations have been identified as suitable for further consideration.

National Park Service transportation programs are based largely on funding available to the NPS through the U.S. D OT. The Federal Lands Highway Office of the FHWA, through cooperative agreements with Federal land managing agencies such as the National Park Service, administers a coordinated Federal Lands Highway Program, which includes the NPS Park Roads and Parkway Program (PRPP). The PRPP funds primarily are used to address the backlog of park road and parkway reconstruction needs, but also fund the Transportation Management Program (TMP - previously called the Alternative Transportation Program), which was established in 1998 as a subset of the PRPP. The TMP coordinates transportation policies, projects, and activities related to planning, partnering, and implementation of transportation systems that provide alternatives to visitor vehicle use within national park, as well as for travel between parks and nearby communities. ITS applications that promote travel shifts from private motor vehicles to alternative transportation are eligible for funding under the TMP. And, in Fiscal Year 2006, the use of PRPP funding was relaxed so that ITS applications for park roads and parkways could be funded as part of road and bridge projects. ITS projects within the NPS also have been funded by the FHWA/FLH Coordinated Technology Implementation Program (CTIP), through financial and contributions from partner organizations, as well as other sources.

Funding for ITS projects is a significant constraint to widespread implementation, and the NPS funding outlook is cloudy at best given the high priority placed on addressing the pressing backlog of NPS road and bridge improvement needs. Following the enactment of SAFETEA-LU in 2005, the NPS curtailed TMP funding in an effort to rely on the Alternative Transportation in Parks and Public Lands (ATPPL) program authorized by Section 5320 of SAFETEA-LU. This transition from predictable annual PRPP funding allocations for TMP to ATPPL, under which funding is awarded based on competitive proposals among eligible recipients, has made long-term planning and programming of projects unpredictable at best. Lacking a predictable fund source, parks are likely to continue to pursue ad hoc, opportunistic ITS strategies independent of any overarching strategic plan. The NPS is considering the reinstatement of dedicated TMP funding under the PRPP beginning in FY08, in part to provide more predictability yet stopping short of categorical funding for ITS.

An unpredictable funding environment makes it difficult to pursue concerted ITS program initiatives, especially those that require dependable multi-year (i.e., categorical) funding. However, the funding environment should not overly influence the development of program initiatives, which should reflect needs and priority goals and objectives even though these may be pursued opportunistically. That said program initiatives do need to consider fiscal realities to avoid grand visions without any possibility of implementation.

The following program considerations reflect the combined perspectives of Volpe Center and FHWA Federal Lands Highway staff. These represent a range of possibilities extending from actions that can be taken immediately within the existing PRPP / TMP structure to actions that would be appropriate as part of a significant categorical initiative in conjunction with SAFETEA-LU reauthorization, such as activities to determine the need for systemic ITS applications.

ITS Program Considerations Under the Existing PRPP / TMP Program Structure

ITS Program Considerations (Outlined more fully in the narrative following the table)	Near Term Importance
▪ Incorporate ITS considerations as NPS refines its transportation planning guidelines	High
▪ Determine ITS Architecture conformity for near-term NPS prospects	High
▪ Work with FHWA and FTA to develop ITS cooperatively with state and local transportation agencies; strategies include: ▫ Document a de facto NPS ITS Architecture based on the baseline inventory as a basis for communicating NPS ITS interests to prospective partners ▫ Determine the business case and outreach strategy to state and/or regional traveler information "511" initiatives to ensure inclusion of NPS sites and information as appropriate ▫ Proactively promote inclusion of NPS alternative transportation systems and park destinations in regional transit trip planning websites	High
▪ Capture and catalogue benefits and lessons learned from ITS applications in national parks	High
▪ Work with FHWA, FTA and the DOT ITS Joint Program Office, to ensure that NPS needs are included in ITS training and peer-to-peer technical assistance programs	High

Incorporate ITS in transportation planning activities and guidelines

At least 20 national parks have conducted, are conducting, or plan to conduct ITS needs assessment; many are doing so with local and regional governments to better serve to park visitors both in the park and in the gateway communities that welcome them. Given this level of interest, more explicit treatment of ITS in NPS transportation planning activities, both within the PRP and TMP, appears essential to promote and facilitate appropriate ITS development. At a minimum, parks and partners need to have awareness and understanding not only ITS technologies but how these can be constructively applied in park settings and the criteria by which ITS projects are to be proposed and evaluated for funding. An important initial step within the TMP is the inclusion of a project planning factor that requires non-construction options, including ITS strategies, to be considered when analyzing the need for developing and/or expanding an Alternative Transportation System at a park. A corresponding formal planning factor has yet to be incorporated within the PRP but several park road and parkway projects have considered how ITS might be incorporated to minimize the need for roadway expansion and/or improve traffic operations. The FHWA requirement that the NPS develop a Congestion Management System (CMS) that can be used as a basis for roadway investment decisions should contribute to the active consideration of ITS opportunities for alleviating congestion.

Determine ITS Architecture conformity policy for near-term NPS project prospects.

Any ITS projects funded with FHWA or FTA funding must conform to the National ITS Architecture and Standards (see: http://www.ops.fhwa.dot.gov/its_arch_imp/policy.htm). Conformity is accomplished

through the development of regional ITS architectures and using a systems engineering process for ITS project development as part of a statewide or regional transportation planning process; hence any NPS projects that are covered by statewide or regional architectures may be funded by FHWA and/or FTA. Those that are not covered require project level assessments to determine conformity to the National ITS Architecture and Standards to receive FHWA or FTA funding. The NPS should request that the FHWA and FTA help ensure that priority ITS projects conform to the National ITS Architecture and Standards. As the multi-year program of projects is finalized, the NPS ITS projects should be reviewed by FHWA or FTA as appropriate, well in advance, to ensure compliance with the conformity policy. ITS architecture conformity also should be addressed as part of NPS planning projects.

Work with FHWA and FTA to develop ITS cooperatively with state and local transportation agencies.

By working with partners, the NPS can leverage state and local transportation agency ITS investments to serve national park interests. By working with partners, parks can participate not only in the development of regional ITS transportation studies and plans, as well as regional ITS standards to ensure regional ITS interoperability. Given that parks often lack the staff availability, technical knowledge, and expertise to proactively engage in ITS planning processes, it will be essential for D OT partners to help facilitate NPS involvement. Much of the NPS success with ITS to date has resulted from cooperative efforts with other agencies Not only does collaboration allow parks to leverage the knowledge base within transportation agencies, it also can result in cost sharing opportunities with partners – especially with respect to ongoing system operations and maintenance. The ITS baseline inventory provides a way to target cooperative efforts to ensure that NPS interests are advocated and incorporated in regional ITS architecture, "511" initiatives and other regional traveler information and traffic management activities. Effort should be directed toward identifying near-term NPS interests that are located within states and/or regions with active ITS programs or planning initiatives. Potential strategies include:

- **Document a de facto NPS ITS Architecture based on the baseline inventory as a basis for communicating NPS ITS interests to prospective partners**

  Having an NPS ITS Architecture provides a basis for communicating prospective NPS interests to state and regional transportation planning agencies in a common language, based on structures and definitions provided by the National ITS Architecture. Whereas project level ITS architectures have been developed by individual parks and this will likely continue given the diversity of ITS interests among the parks, developing park specific ITS architectures for every park that may be considering ITS is cost inefficient. A high-level NPS ITS Architecture, developed as a subset of the National ITS Architecture, would be useful as a means of coordinating the basic set of NPS interests to prospective partners and others. A high-level architecture would not alleviate the need for more detailed park-level architectures entirely, but would go a long way in facilitating a shared understanding of ITS applications in national parks. To be successful the high-level architecture needs to provide a cross-walk between the details of the National ITS Architecture and terminology that is more familiar NPS personnel. Once developed the architecture should be distributed with the assistance of FHWA and FTA to ensure NPS interests are appropriately shared with state and regional ITS planners.

- **Determine the business case and outreach strategy to state and/or regional traveler information "511" initiatives to ensure inclusion of NPS sites and information as appropriate**

  More so than most any other aspect of ITS, travel information appears to be a natural fit for national parks. Visitors planning trips to national parks by accessing NPS.gov voice strong interest in being able to get timely and accurate information about travel alternatives and conditions. The NPS Chief Information Officer recognizes the opportunities associated with developing additional trip planning

functionality on the NPS.gov portal, and additionally supplemental travel information is provided by roughly thirty parks. The NPS traveler information strategy rests on three elements: improving park specific travel and traffic information; developing key traveler information products and promoting consistent implementation across park units; and developing coordinated distribution channels that take advantage of partnership leverage opportunities.

The baseline ITS inventory provides a helpful starting point for identifying areas of the country that may offer fruitful prospects for participation by national parks in statewide and/or regional "511" initiatives. A logical next step is developing a business case for systematic NPS involvement in state and regional initiatives relative to specific park units. A selective, service-wide initiative is envisioned under WASO leadership with support from D OT partners. Assuming a positive business case results, a follow-on step would be to prepare an implementation plan that defines roles and responsibilities, timetables, and resource requirements - initially under the current PRPP/TMP structure, with the possibility for more aggressive action should a categorical ITS program be established. Based on the implementation plan, NPS WASO transportation program and planning staff could outreach to targeted state and/or regional "511" initiatives, and work with parks to effect the incorporation of national park traveler information within state and regional "511" initiatives and systems. A WASO point of contact would be designated and assigned to coordinate with and participate in activities of the national 511 Deployment Coalition to promote awareness of NPS "511" implementation objectives. It is envisioned that much of the implementation effort exerted at the state and local level by WASO transportation planners would be with the assistance of U.S. D OT agency counterparts. Importantly, it is anticipated that the NPS may be asked to contribute financially to provide for its participation in cooperative "511" systems.

- **Proactively promote inclusion of NPS alternative transportation systems and park destinations in regional transit trip planning websites**

Transit trip planners in major urban areas should be explored and exploited. Opportunities exist, particularly with respect to urban parks, to leverage web-based trip planners being developed and operated by others. Visitors who reside nearby urban parks are likely to seek information about transportation options from a regional public transit website. Therefore, it is important to ensure that park destinations and alternative transportation services are communicated through such channels. Google, a popular web search tool has added a transit trip planner capability in cooperation with transit agencies (Figure 7, next page). Although the Fort Vancouver National Historic Site has been prominently displayed on the map since the website was launched, visitors who initially tried to request transit directions to the Fort would get the following message: "We could not understand the location Fort Vancouver National Historic Site." Subsequently, the transit agency associated a street address with "Fort Vancouver" so visitors can get information about transit service to the park from anywhere in the Portland area. A need exists to ensure that park locations are geo-coded and linked to street address databases used by transit trip planner websites.

The National Parks of Massachusetts trip planner represents an approach for linking park specific information with general information about how to get to parks using public transit, but stops short of attempting to keep up with fare and schedule changes for a multiplicity of bus, subway, commuter rail and ferry services. It provides a link to the Massachusetts Bay Transportation Authority (MBTA) trip planner website so that visitors can get detailed route, transfer, and fare information about how to get to any park within the Boston metropolitan area at a specific time of day. Since national park sites in the Boston metropolitan area (or elsewhere in Massachusetts for that matter) had not previously been geo-coded, the MBTA gladly accepted this information about park destinations and incorporated it within its trip planner.

FIGURE 7 Google Transit Trip Planner Website - Portland, Oregon
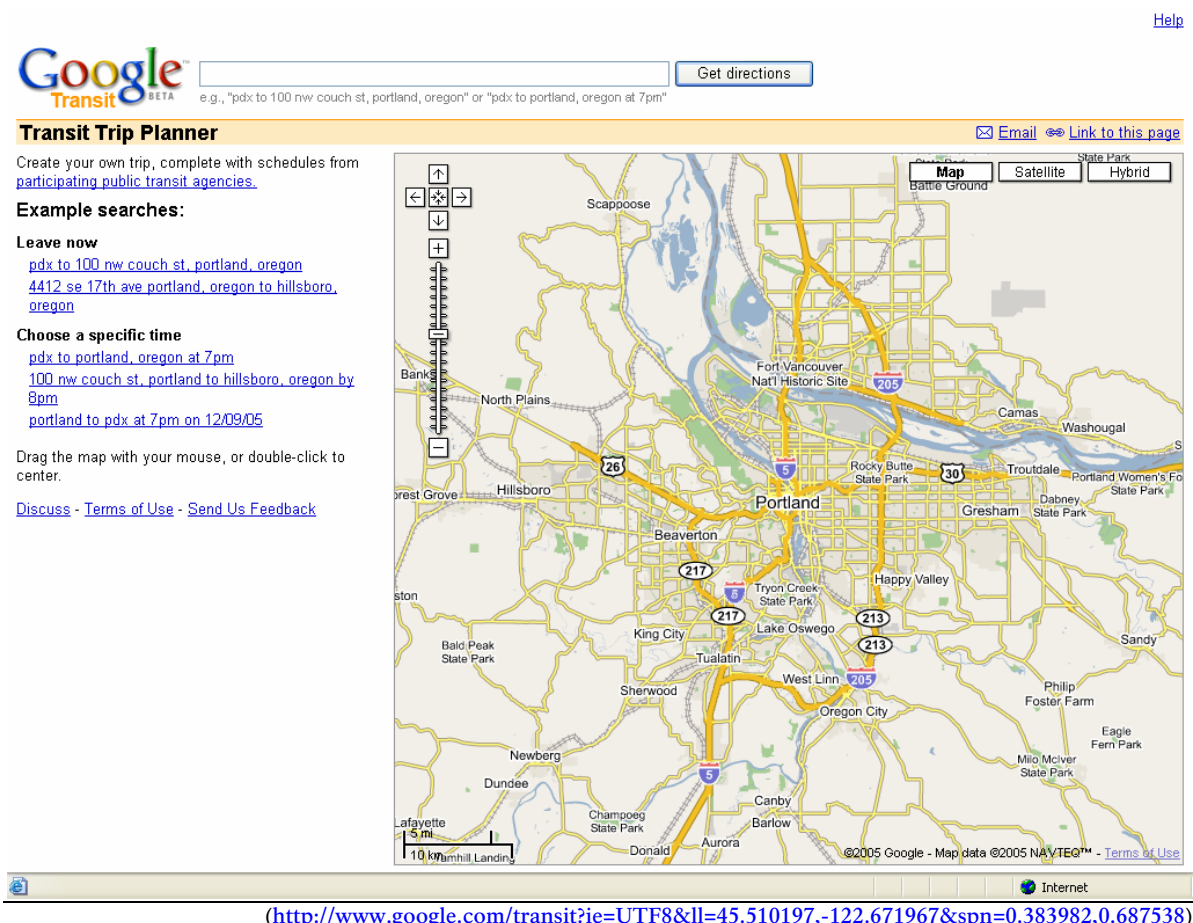
(http://www.google.com/transit?ie=UTF8&ll=45.510197,-122.671967&spn=0.383982,0.687538)

Capture and catalogue benefits and lessons learned from ITS applications in national parks

The NPS Regional FLHP Coordinators have some familiarity with ITS but along with most park service staff, are not conversant with ITS technologies, applications and/or the beneficial effects that have been achieved in parks. Whereas considerable information exists in the form of technical reports and research papers, essential information for park transportation planners and decision makers is not available in easily accessible forms. Widespread awareness of ITS and its beneficial use in national park settings is essential to generating interest and in building support for opportunistic initiatives as well as for systemic ITS program initiatives. There is a corresponding need for sharing the lessons learned from early ITS applications: financing techniques; what worked well and opportunities for improvement – both from a technical and institutional perspective; park transportation facility condition implications; any procedural pitfalls; and lingering regrets. Such findings should be organized and published to afford easy and flexible assess. Importantly information on ITS applications should be related to park transportation issues and problems; and presented in the context of comprehensive transportation solutions that often include ITS as an element of a broader system or strategy rather than as stand alone solutions. The *Transportation Tool Kit for FLMA Managers* being developed for the FHWA Central Federal Lands Highway Division by the Western Transportation Institute may serve as a useful model in that presents ITS as a tool that can be applied in separately or integrated with transportation systems to enhance performance or functionality.

Work with FHWA, FTA and the ITS Joint Program Office, to ensure that NPS and other public lands agency needs are included in ITS training and peer-to-peer technical assistance programs

Second to funding, staff capability is the most significant NPS constraint to planning, designing, deploying and operating and maintaining ITS applications in national parks. The NPS relies extensively on the U.S. DOT for transportation expertise, and consequently has limited knowledge and capability with which to plan, implement, and maintain the advanced technology systems associated with ITS. Ongoing operations and maintenance responsibilities for ITS is not something that is offered by DOT and therefore will rest with the NPS or its other partners. However, ITS operations and maintenance has been and will continue to be a challenge for most parks. Basic ITS training for park planners and decision makers to make them aware of the potential of ITS in terms of benefits, costs, and implementation challenges. Providing for the ongoing operations and maintenance of ITS technology is another challenge, but one that increasingly can be addressed through contractual support if park staff (possibly with assistance of government agency partners) have sufficient knowledge to provide oversight of and direction to contractors.

Despite growing interest in ITS represented by the growth in project proposals, the extent and level of ITS awareness and understanding has not kept pace, especially as it relates to incorporating ITS features as a normal part of road and transit modernization initiatives, and/or how and when to consider ITS features during the project planning and development process. Under its Professional Capacity Building program, the DOT ITS Joint Program Office develops training materials targeted to state and local transportation agencies. The NPS, in cooperation with other public lands agencies, FHWA/FLH, and FTA, should seek to have such ITS training materials tailored to public lands audiences. Given the dispersed nature of the NPS, it is important that the course employ distance learning techniques so that it can be offered both in classroom settings and over the web.

Similarly, the U.S. DOT ITS Joint Program Office has an Intelligent Transportation Peer-to-Peer program (http://www.its.dot.gov/peer/index.htm) that provides short-term assistance to address specific, technical needs. The program is available to any public agency or group involved in planning, evaluating, making decisions, or operating an ITS. It offers assistance in the following areas:

Planning & Programming	Procurement	Modeling
Institutional Issues	Resource Materials	Simulation
ITS Standards	Financial Issues	Telecommunications
System Design	Education	Software Systems
National ITS Architecture	Training	Other Related Topics
System Architecture	Facilitation	
Operations	Awareness	
Maintenance	Partnerships	
Scoping Documents	Systems Integration	

Technical assistance is provided by a cadre of over 120 transportation professionals, mostly public sector staff who are active in the planning, design, procurement and implementation of ITS. If on-site support is required, the program reimburses the travel costs of the peer support provider. Assistance if provided on a priority basis determined by the DOT ITS Joint Program Office given that funding is limited. However, program support can be provided on a dedicated basis if supplemental, dedicated funding is provided for specific groups. The NPS, possibly in conjunction with other public lands agencies, could work with FTA and/or FHWA/FLH to provide dedicated funding for peer-to-peer technical assistance. It is anticipated that $10,000-25,000 would be sufficient for NPS needs for one to two years at current ITS activity levels.

ITS Program Considerations Relative to a Categorical ITS Program Initiative

ITS Program Considerations (Outlined more fully in the narrative following the table)	Near Term Importance
▪ Assess ITS needs relative to traffic congestion, parking management, ATS information, road closure and construction zone delays / detours, and weather / fire / flood hazard information	High
▪ Conduct surveys to identify visitor needs, values, attitudes, and interest in ITS serving national parks	Medium
▪ Develop context sensitive ITS design principals and recommendations, both with respect to field devices and user interfaces	Medium
▪ Establish a website to promote ITS awareness among NPS planners and decision makers	Medium

▪ In launching a categorical ITS program, build ITS awareness through activities such as:
  ▫ Conduct a literature review and synthesis of practice with respect to ITS applications in recreational and/or tourist areas, such as national parks
  ▫ Showcase event at Acadia National Park or Glacier National Park to demonstrate successful ITS deployment in a national park
  ▫ Scanning tour of recreational and/or tourist sites around the world that apply ITS successfully
	Lower

▪ Include formal evaluations of ITS applications As part of a categorical ITS program, to validate benefits and enrich the knowledge base regarding ITS applications in parks	Lower
▪ Promote and facilitate research and evaluation by universities and others regarding ITS applications in parks and public lands	Lower

Assess ITS needs relative to traffic congestion, parking management, ATS information, road closure and construction zone delays / detours, and weather / fire / flood hazard information

To the extent that most national parks provide information on travel and traffic conditions for park roads and parkways, it tends to be limited, static or both. Timely and accurate information is the cornerstone of any successful ITS application. Outdated or static information is poorly valued and often ignored. ITS entails a commitment to collecting and validating information on transportation system operations and performance on an "up to the minute" basis. The current NPS traffic counting program and various ATS data collection activities do not provide a continuous data stream to support most ITS applications, nor are these necessarily sufficiently comprehensive. Moreover, few parking areas within national parks have monitoring capabilities that would allow information on parking availability to be provided to visitors. Typically, "real-time" monitoring capabilities are planned in conjunction with any comprehensive ITS initiative at parks but opportunities exist to address less demanding needs. As part of ongoing efforts to reinvigorate the traffic counting program and to establish a Congestion Management System as required by FHWA regulation, the NPS should consider how ITS technologies can be applied to leverage data collected from traffic and congestion monitoring programs not only for planning purposed but also possibly to provide "real-time" information to park visitors. To the extent that multiple-park needs exist, consideration should be given to addressing such needs on a "service-wide" basis to reap the advantages of having consistent systems, data and technology support.

Conduct surveys to identify visitor needs, values, attitudes, and interest in ITS serving national parks

Recreational travel differs markedly from typical commuter travel patterns in urban areas for which many ITS applications have been developed. Visitor travel is discretionary; different values are placed on travel speed and waiting times; and, travelers often do not respond to changes in costs similarly to commuters. Understanding the behavior of recreational travelers could be a crucial ingredient in NPS transportation planning overall; and improved understanding of recreational travel behavior is needed so that ITS services can be tailored to park visitor needs and interests, rather than be implemented as replicas of ITS services in metropolitan areas. Information about getting to national parks and park transportation conditions within national parks is the most highly sought information by users of the NPS.gov website. Little is known, however, about whether and how visitors alter travel plans based on information they receive while planning a park visit. In some parks the ability to influence visitation patterns may be sufficient to avoid congestion and/or associate resource damage and visitor experience degradation simply by shifting some visitation to off-peak periods (hourly, daily and/or seasonally) or to less visited areas of the park. Likewise the use of ITS technologies to inform visitors about alternative transportation services can be effective in alleviating traffic and/or parking congestion during peak periods of visitation.

Develop context sensitive ITS design principals and guidelines, both with respect to field devices and user interfaces

The visual landscape is of paramount importance in many national parks. The NPS strives to ensure that man-made devices, including ITS cameras, antennae, and variable message signs blend unobtrusively into the park landscape. Most electronic signs and sensors associated with many ITS applications have been developed to meet transportation agency requirements, which place greater emphasis on functionality than on visual aesthetics. National park settings often are more sensitive to the visual impacts associated with such devices. A heightened sense of the visual and aural impacts of ITS technologies is needed with respect to national park applications. The choice of sign components and structural materials, size/scale, and display intensity control were carefully considered by the FHWA in its efforts to develop a dynamic message sign (cover photo) for potential NPS-wide adaptation. There is need to develop context sensitive ITS applications and designs that can be applied economically within a wide range of national park settings, yet also adapted to reflect the character of individual park units. Apart from visual aesthetic considerations in natural settings, deploying ITS at parks in remote areas also needs to be considered in the context of the sparse electrical power and communications infrastructures found in many rural areas, as well as park policies against infrastructure development, especially in park wilderness areas.

Similarly, the user interface for ITS applications requires thoughtful consideration given that visitors are unfamiliar with transportation options when first visiting a national park. It is important that ITS services be intuitive and easy to use, yet heretofore most ITS applications have been deployed in urban settings by transportation providers that serve repeat travelers who are willing and able to invest time and effort to learn how to use ITS services to make their travel safer, more efficient, or easier. A significant number of visitors to the most popular national parks are first-time visitors who are traveling great distances, often at considerable expense to have a "once in a lifetime" experience. Others are opportunistic visitors who may have decided to visit a park after discovering the park during a trip to the area for other purposes, and likewise are unfamiliar with transportation options for getting to a park or accessing sites within a park. Moreover, some parks attract significant numbers of international visitors, whose disposition toward the use of transit may exceeds their familiarity with the English language. The TMP has striven to promote consistency among park websites relative to alternative transportation information so that visitors who visit multiple parks are able to find information in similar locations on the websites for individual parks.

Establish a website to promote ITS awareness among NPS planners and decision makers

The California Department of Transportation (Caltrans) sponsored the development of an ITS Decision website (Figure 8 below) to promote ITS understanding among transportation agency decision makers, as well as to provide useful information and insights about applying ITS to meet transportation needs. The NPS could develop a comparable framework to provide modified content to NPS and partner staff that relates more directly to the context of national park transportation issues and terminology. Notably such a website could be used to deliver information on "ITS Benefits" to NPS Regional FLHP Coordinators, as well as provide useful information to staff and others developing ITS project proposals.

FIGURE 8 "ITS Decision" Website
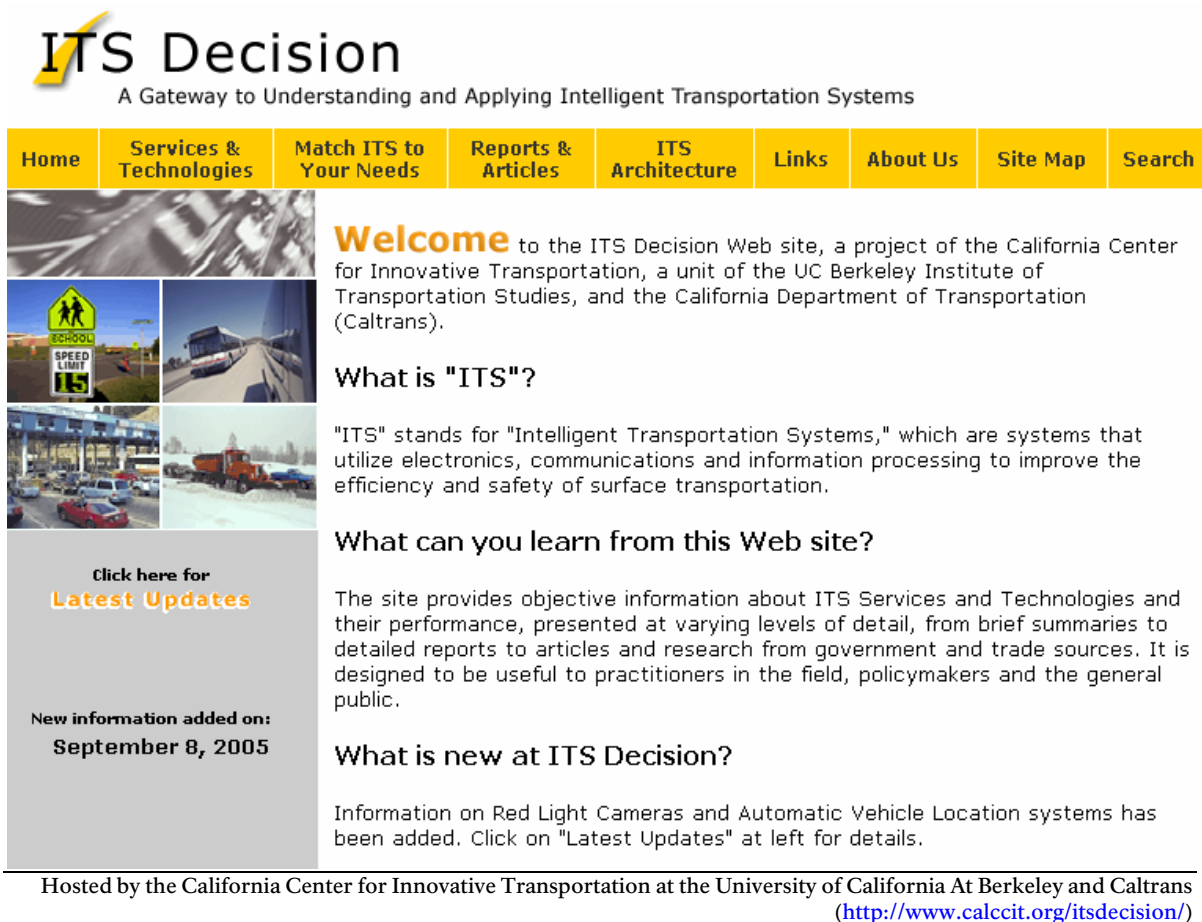
Hosted by the California Center for Innovative Transportation at the University of California At Berkeley and Caltrans
(http://www.calccit.org/itsdecision/)

In launching a categorical ITS program, build ITS awareness through activities such as:

▫ **Conduct a literature review and synthesis of practice with respect to ITS applications in recreational and/or tourist areas, such as national parks**

Park visitors are more likely to use ITS services that are designed, packaged, and marketed to meet their needs. Visitor acceptance research uses focus groups and surveys to identify traveler needs, values, attitudes, and interests concerning transportation to and within national parks. Results from

such research could help NPS to prioritize the development of ITS services. Building off of the Acadia field test and other national park experiences, additional market research could be initiated regarding visitor needs and interests in ITS applications and services in varied national park settings. Likewise, research is needed to understand the willingness of national park visitors to pay for ITS services, as commercially viable services might be provided through concessions. A prudent initial step would be to conduct a literature review of research to date as well as research in progress in an effort to synthesize the findings from NPS and corresponding applications of ITS in recreational and/or tourist travel areas.

- **Showcase event at Acadia National Park or Glacier National Park to demonstrate successful ITS deployment in a national park**

  A field operational test of ITS in a national park setting was conducted in Acadia National Park. And, Glacier National Park is relying on ITS traveler information to minimize traffic delays during the eight year reconstruction of the Going-to-the-Sun-Road. These parks are pursuing a integrated suite of ITS applications, and provide a good venue for park transportation planners and decision makers to get a first hand overview of multiple ITS applications in a national park. These sites also offers the opportunity for prompting a productive dialogue regarding how to integrate ITS effectively with state and local transportation plans and programs. The target audience would include PRPP and TMP planners and decision makers, corresponding U.S. D OT program staff, other federal land agency transportation staff, and possibly staff from the NPS concessions program.

- **Scanning tour of recreational and/or tourist sites around the world that apply ITS successfully**

  Scanning Tours are useful to provide powerful opportunities for peer-to-peer level interactions on topics of mutual interest. A scanning tour would allow NPS, U.S. DOT partners, and others with a first-hand ability to learn from other organizations that have successfully applied ITS to explore ideas and exchange information on success factors. Scanning tours often include international destinations so as to consider innovative perspectives beyond the traditional or commonplace thinking within a single country, even one as big as the United States. International perspectives should be particularly useful with respect to ITS applications with respect to alternative transportation given the greater diversity and use of such systems in other countries. The NPS should determine its potential interest in a scanning tour and convey this to U.S. D OT and other interested organizations (i.e., ITS America, Transportation Research Board, National Park Foundation, etc.) that may be a position to organize a tour within which the NPS might be a participant. Notably, the NPS might offer to host such a tour at Acadia, Glacier and/or other parks that offer insights on ITS in America's national parks.

Include formal evaluations of ITS applications As part of a categorical ITS program, to validate benefits and enrich the knowledge base regarding ITS applications in parks

Although efforts to date has contributed significantly to the body of knowledge regarding ITS in national parks opportunities exist to further contribute to the understanding of how ITS can be applied to achieve transportation goals and objectives in national parks. The NPS selectively evaluates new or expanded alternative transportation services, which in some instances such as at Acadia and Glacier, involve ITS. Whereas the cost of such evaluations can be significant, the NPS may be able to partner with the U.S. DOT agencies in financing evaluations, such as the evaluation of the Acadia ITS Field Operational Test. Evaluations should cover both park road and alternative transportation ITS applications. Near term possibilities include evaluation of ITS in work zone management (George Washington Parkway and Glacier National Park), the ability of ITS to promote voluntary visitor use of alternative transportation services (Cape Cod National Seashore and Glacier National Park, ITS in congestion management (Golden Gate National Recreation Area) and the benefits of ITS in providing information on prevailing roadway conditions and weather (Yellowstone).

The evaluations should be accomplished in association with parks yet in a way that ensures findings and results are objective; therefore, evaluations should be funded and administered by WASO, and performed by a qualified independent organization not associated with the project to be evaluated and to the extent possible, does not otherwise have any interest in the outcome of the evaluation. The evaluation reports should be written primarily for NPS audiences and any associated data and findings should be compiled along with lessons learned relative to any similar future efforts. Park benefits from the ITS project should be documented and incorporated into the overall synthesis of ITS benefits suggested above.

Promote and facilitate research by universities and others regarding ITS applications in parks and public lands

The baseline inventory of ITS in national parks provides an indication of which ITS applications are most meaningful to park managers and in their eyes, park visitors. Unknowns relate to visitor expectations for ITS services in national parks and how ITS technologies can be incorporated in national park settings so as to add rather than detract from the quality of the visitor experience.

Research activities have been undertaken by organizations such as Caltrans, the Western Transportation Institute, and the National Park Transportation Scholars. A greater understanding of ITS and its effects in national park applications would help in targeting future program development activities. Although the NPS does not have a dedicated funding for transportation research activities, it can continue to work in cooperation with other organizations that do: the U.S. D OT ITS Joint Program Office, Federal Highway Administration, the Federal Transit Administration, the Transportation Research Board, University Transportation Centers, state transportation agencies, and the National Park Foundation, etc. The NPS can be proactive in developing research problem statements for the consideration of researchers and the programs administered by other organizations.

Concluding Remarks

The baseline ITS inventory and preliminary program assessment reveal that interest in and use of ITS in national parks is strong and growing. There are several park units where infrastructure or components exist that might be used in ITS applications, including traveler advisory radio, variable message signs and traffic counters. Regrettably, financial constraints dictate that the NPS pursue ITS initiatives in a highly selective and/or opportunistic manner. To date it appears that NPS partners have invested as much or more than the NPS itself it ITS initiatives that serve national parks. It appears that the greatest strides in ITS may continue to come through partnership; recognizing that developing partnerships require extensive staff time and in most instances cost-sharing financial contributions as well. However, the leverage can be significant.

Clearly the preliminary set of potential ITS program considerations is not exhaustive in scope. Fee collection and automated entry, for example, is another area where systems and infrastructure are often in place, and could be leveraged to serve transportation needs. Most park units collect information on the number and type of arriving vehicles and visitors (often using traffic counters) and log such information in an electronic, often automated, form. The list of ITS possibilities herein is representative rather than exhaustive. The preliminary program assessment serves as a starting point for further program planning discussions among the NPS and its U.S. D OT partners. A description of what constitutes ITS success— such as reduction of congestion, an increase in visitor satisfaction, or improvement in environmental measurements—is essential in informing future justifications for ITS project prioritization, continuation, expansion, as well as program initiation or cessation decisions.

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Appendix: 2005 Baseline Inventory of ITS in National Parks

Included in this appendix is the full database of NPS ITS activities, as compiled by the Volpe Center. This inventory identified potential ITS components of transportation projects listed within the NPS Project Management Information System (PMIS), as well as park projects listed with the Federal Lands Highway Program and the ITS Joint Program Office. In addition, Volpe Center staff contacted NPS Regional FLHP coordinators, and other NPS staff to obtain further information on particular projects and to confirm the breadth and depth of the projects identified in the initial review. Much of the reported information is based on the subjective interpretation of the stated definition of ITS—which focuses not only on technological systems but also on the manner and concurrency of communication between various information and telecommunications systems. In addition, some ITS projects may be underreported because they are in the conceptual or pre-conceptual phases. While many federal lands and/or park units might have considered or hoped for ITS projects down the line, real and perceived funding limitations and constraints may have precluded respondents from reporting these as ITS projects.

The baseline inventory was compiled primarily to provide an overall sense of the nature and extent of ITS activities in National Parks. Thus, the information listed generally is presented as reported with only limited verification or validation effort, primarily a review of the summary level data by NPS Regional FLHP Coordinators. Therefore it may be inaccurate and/or incomplete and possibly outdated due to the passage of time. Users are cautioned that inaccuracies are likely to exist with respect to specific data elements, such that particular items should be confirmed with individual park units prior to referencing or publishing data contained herein. Nonetheless, the baseline inventory does provide a representative overview of the state of ITS in National Parks as of 2005.

The baseline inventory is presented in a three part appendix that provide different views of the ITS in national parks inventory data.

- Appendix 1 provides information on ITS projects in national park units within six of the seven NPS regions. No ITS applications were reported for the Alaska Region. It contains a brief description of the project, its purpose, related park functions, and associated ITS services. It also provides cost estimates (these have not been verified and may include items that are not solely related to the ITS portion of a project), and preliminary information about the existence of an ITS architecture in the vicinity and/or a "511" travel information initiative.

- Appendix 2 provides a summary of ITS projects in alphabetical order by individual national park. This appendix allows easy access to information about ITS any park unit.

- Appendix 3 provides a summary of ITS projects by service type. This appendix provides a list of parks that are associated with particular ITS services.

AGENCY REGION: Intermountain

Arches National Park

FLHD Region: **West**

Location **UT**

Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**	n/a	**Fleet Size**	0	**Comments**
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**		**Comments**

511 Program	Yes	**511 Coverage**	statewide	**Status** Ready for Use	**Comments**

External architecture nearby? No	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?**	**Scope**
Name:		**Comments**	

Project Information

Title: **Evaluation of Potential Applications of ITS Technology**

Contact

Description:	Comprehensive study of possible ITS applications
Purpose	Parking demand exceeds capacity; congestion at entry area; provide better travel information
Park Functions	Parking management; Congestion management; Travel information
Services (Existing or Projected)	

Phase Planning

PMIS or Project# FLHD-ARCH

Initial Planned FY 2004 **Requested Fund FY**

Total Cost

ITS Component(s)

Fund Request

Funded? Yes **Year Funded:**

511 System Integration
Automated Entry System
Highway Advisory Radio
ITS Needs Assessment
Parking Management/Availability
Reservation Systems
Trip Planning tools

Reported ITS Applications at National Parks

AGENCY REGION: Intermountain

Bryce Canyon National Park

FLHD Region: **West**
Location **UT**
Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**	Bus	**Fleet Size**	**Comments**	
ATS On-Site	Yes	**Vehicle Type(s):**	Bus	**Fleet Size**	**Comments**	seasonal (summer); no fee

511 Program	Yes	**511 Coverage**	statewide	**Status**	Under Development	**Comments**

External architecture nearby? No **Unit included in the external architecture?** No **Inclusion on-going or project-specific?** **Scope**

Name: **Comments**

Project Information

Title: FastPass Electronic Gates

Contact   Michael Castagnetto   (435) 834-4200

Description: Install electronic gates for fee collection at Bryce Point Intersection

Purpose Managing the Bryce Point parking lot 1.5 mi away from the intersection; will also provide access to shuttle buses when lot is full; will reduce vehicle congestion at park unit overall

Park Functions Parking congestion; Traffic management; Intelligent transit vehicles

Phase Implementation   **PMIS or Project#** 59484

Initial Planned FY 2001   **Requested Fund FY** 2001

Total Cost $110,700
ITS Component(s) **$110,700**

Fund Request $110,700

Funded? Yes   **Year Funded:**

Services (Existing or Projected)

Automated Entry System

Title: Interpretive Signing for ATS

Contact   Robert M. Danno   (435) 834-4800

Description: Interpretive Signing for ATS

Purpose

Park Functions Variable message signage; Travel information

Phase Implementation   **PMIS or Project#** 63196

Initial Planned FY 2001   **Requested Fund FY** 2000

Total Cost $185,000
ITS Component(s) **$185,000**

Fund Request $185,000

Funded? Yes   **Year Funded:**

Services (Existing or Projected)

Interpretive Signage

Title: Equipment Acquisition -- Purchase and Install a Variable Message Sign

Contact

Description: Purchase and install variable message sign

Purpose Enhance traveler information

Park Functions Travel Information

Phase Implementation   **PMIS or Project#** FLHD-BRCA

Initial Planned FY 2000   **Requested Fund FY**

Total Cost $140,000
ITS Component(s) **$140,000**

Fund Request

Funded? Yes   **Year Funded:**

Services (Existing or Projected)

Variable/Changeable Message Signs
Transit Management
511 System Integration
Parking Management/Availability

Reported ITS Applications at National Parks

AGENCY REGION: Intermountain

Glacier National Park

FLHD Region: **West**
Location **MT**
Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**
ATS On-Site	No	**Vehicle Type(s):**	Bus	**Fleet Size** 32	**Comments** Buses were refurbished by private motor vehicle company

511 Program	Yes	**511 Coverage**	statewide	**Status** Under Development	**Comments**

External architecture nearby? No

Unit included in the external architecture? No

Inclusion on-going or project-specific?

Scope

Name:

Comments

Project Information

Title: **Going-to-the-Sun Road Rehabilitation Project**

Contact

Description: Real-time traffic information during and after rehabilitation of Road

Purpose Congestion management; traffic management during and after rehabiliation project

Park Functions Traffic Management; Congestion Management; Travel Information

Phase Planning

PMIS or Project# GLAC ?

Initial Planned FY 2006 **Requested Fund FY** 2006

Total Cost

ITS Component(s)

Fund Request

Funded? Yes **Year Funded:**

Services (Existing or Projected)

Transit Management
Integrate ITS with local DOTs
Work Zone Management
Weather/Road Condition Information
Vehicle Tracking System
Variable/Changeable Message Signs
Travel Information Kiosks
Travel Information -- Unspecified
Traffic Monitoring System
Road Construction Information
Parking Management/Availability
In-Vehicle Electronic Information
Highway Advisory Radio
511 System Integration
ITS Needs Assessment

AGENCY REGION: Intermountain

Grand Canyon National Park

FLHD Region: **West**
Location **AZ**
Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**	n/a	**Fleet Size**	0	**Comments**	
ATS On-Site	Yes	**Vehicle Type(s):**	Bus	**Fleet Size**	12	**Comments**	

511 Program	Yes	**511 Coverage**	statewide	**Status**	Ready for Use

Comments Park phone numbre provided to callers, on website

External architecture nearby? No	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?**	**Scope**
Name:		**Comments**	

Project Information

Title: **Development of 511 prototype**

Contact

Description: Develop 511 systems within park through integration with Arizona DOT

Purpose Enhance traveler information

Park Functions Travel Information

Services (Existing or Projected)

Variable/Changeable Message Signs
Trip Planning tools
Automated Entry System
Highway Advisory Radio
Parking Management/Availability
Travel Information Kiosks
Reservation Systems

Phase Planning		**PMIS or Project#**	?
Initial Planned FY	**Requested Fund FY**		
Total Cost			
ITS Component(s)			
Fund Request		$0	
Funded? Yes	**Year Funded:** 2004		

AGENCY REGION: Intermountain

FLHD Region: **West**

Location **WY**

Grand Teton National Park

Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size** 0	**Comments**
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size** 0	**Comments**
511 Program	No	**511 Coverage**	**Status**		**Comments**

External architecture nearby? No   **Unit included in the external architecture?** No   **Inclusion on-going or project-specific?**   **Scope**

Name: **Comments**

Project Information

Title: **Grand Teton National Park Transportation Plan**

Contact

Description: Various applications during course of park-wide transportation improvements	**Phase** Planning **PMIS or Project#** ?
Purpose	**Initial Planned FY** **Requested Fund FY**
	Total Cost $29,100,000
Park Functions Travel Information; Parking Management; Roadway Management	**ITS Component(s)** **$381,000**
	Fund Request $0
Services (Existing or Projected)	**Funded?** **Year Funded:**

Reservation Systems

Travel Information Kiosks

Trip Planning tools

Highway Advisory Radio

Variable/Changeable Message Signs

Automated Entry System

Parking Management/Availability

AGENCY REGION: Intermountain

Petrified Forest National Park

FLHD Region: **West**

Location **AZ**

Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**	n/a		**Fleet Size**	0	**Comments**
ATS On-Site	No	**Vehicle Type(s):**	n/a		**Fleet Size**	0	**Comments**

511 Program	Yes	**511 Coverage**	statewide	**Status**	Ready for Use	**Comments** unclear if Park participates

External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?**	No info yet	**Scope** Regional

Name: I-40 ITS Coalition

Comments

Project Information

Title: **Arizona I-40 Traveler and Tourist Information System**

Contact

Description: Travel information along I-40, includes Grand Canyon National Park and Petrified Forest National Park

Purpose Improve visitor experience--I-40 is the only access to several National Parks and tourist centers in the region

Park Functions Travel Information; Congestion Management; Parking Management

Services (Existing or Projected)

Phase Implementation

PMIS or Project# ADOT

Initial Planned FY 1997   **Requested Fund FY**

Total Cost $3,350,000

ITS Component(s) $250,000

Fund Request

Funded? External   **Year Funded:** ?

Highway Advisory Radio

511 System Integration

Reported ITS Applications at National Parks

AGENCY REGION: Intermountain

Rocky Mountain National Park

FLHD Region: **West**

Location **CO**

Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**	Amtrak; Private shuttle bus	**Fleet Size**		**Comments**	
ATS On-Site	Yes	**Vehicle Type(s):**		**Fleet Size**		**Comments**	No fee

511 Program	Yes	**511 Coverage**	statewide	**Status**	Under Development	**Comments**	statewide system launch expected 2005

External architecture nearby? No	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?**	**Scope**
Name:		**Comments**	

Project Information

Title: **Beaver Meadows Fast Pass Lane**

Contact   Joseph R. Evans   (970) 586-1218

Description: Install a "Card Swipe" entry device for a special vehicle lane at the Beaver Meadows Entrance Station

Purpose Reduce congestion at Beaver Meadows; allow passholders quicker access to the park

Park Functions Congestion management; Automated fee payment

Services (Existing or Projected)

Automated Entry System

Phase Implementation

PMIS or Project# 95102

Initial Planned FY 2003   **Requested Fund FY** 2003

Total Cost $19,560

ITS Component(s) **$19,560**

Fund Request $19,560

Funded? Yes   **Year Funded:**

AGENCY REGION: Intermountain

Yellowstone National Park

FLHD Region: **West**
Location **WY**
Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**	Bus; check availability suring off-seas	**Fleet Size**	**Comments**
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**
511 Program	Yes	**511 Coverage**	statewide	**Status** Ready for Use	**Comments**

External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?** Long-term	**Scope** Regional

Name: Grtr Yellowstone ITS Priority Corridor   **Comments**

Project Information

Title: **Greater Yellowstone Regional Traveler and Weather Information System Project**

Contact   John Sacklin   (307) 344-2020

Description:	Install two variable message signs (VMS), a highway advisory radio (HAR) system, and a road-weather information system (RWIS)
Purpose	Allow visitors to make appropriate choices before critical decision points are reached
Park Functions	Travel Information; Public Safety

Phase Planning   **PMIS or Project#** 63231

Initial Planned FY 2001   **Requested Fund FY** 2003

Total Cost	$781,823
ITS Component(s)	**$781,823**
Fund Request	$781,823

Funded? Yes   **Year Funded:**

Services (Existing or Projected)

Variable/Changeable Message Signs
Weather/Road Condition Information
Travel Information Kiosks
Highway Advisory Radio

Title: **Development of 511 in Yellowstone National Park**

Contact   John Sacklin   (307) 344-2020

Description:	Develop 511 systems within park, including variable message signs, etc.; will be integrated with existing programs in Montana and upcoming programs in North & South Dakota, Wyoming and Idaho
Purpose	To complement existing systems (VMS, highway advisory radio, etc.); reduce congestion; increase traveler information;
Park Functions	Travel Information

Phase Planning   **PMIS or Project#** 87988

Initial Planned FY 2004   **Requested Fund FY** 2004

Total Cost	$315,188
ITS Component(s)	**$315,188**
Fund Request	$315,188

Funded? Yes   **Year Funded:**

Services (Existing or Projected)

511 System Integration

AGENCY REGION: Intermountain

Yellowstone National Park

FLHD Region: **West**
Location **WY**
Managing Agency: **National Park Service**

Title: **Yellowstone National Park Automatic Vehicle Identification System Project**

Contact

Description: As the second phase of the Greater Yellowstone Rural ITS Corridor, this project allows for the installation and evaluation of AVI at two entrances to Yellowstone National Park.

Purpose

Park Functions

Services (Existing or Projected)

Automated Entry System

Phase Planning	**PMIS or Project#** YEL-AUT
Initial Planned FY 0	**Requested Fund FY** 0
Total Cost	$400,000
ITS Component(s)	$0
Fund Request	$0
Funded?	**Year Funded:**

Title: **Greater Yellowstone Regional Kiosk Project**

Contact

Description: As the second phase of the Greater Yellowstone Rural ITS Corridor, this project allows for the installation and evaluation of touch screen kiosks that will be placed at high volume visitation areas, such as businesses and welcome centers.

Purpose

Park Functions

Services (Existing or Projected)

Travel Information Kiosks

Phase Planning	**PMIS or Project#** YEL-KIO
Initial Planned FY 0	**Requested Fund FY** 0
Total Cost	$250,000
ITS Component(s)	$0
Fund Request	$0
Funded?	**Year Funded:**

Title: **Greater Yellowstone Regional Weather and Traveler Information Systems**

Contact

Description: The Greater Yellowstone Regional and Weather Information System (GYRTWIS) project will allow travelers in four states the ability to use their cellular telephones to receive forecasted weather and traveler information by calling one telephone number.

Purpose

Park Functions

Services (Existing or Projected)

Weather/Road Condition Information

Phase Planning	**PMIS or Project#** YEL-WTIS
Initial Planned FY 0	**Requested Fund FY** 0
Total Cost	$1,650,000
ITS Component(s)	$0
Fund Request	$0
Funded?	**Year Funded:**

AGENCY REGION: Northeast

Acadia National Park

FLHD Region: **Northeast**
Location **ME**
Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**
ATS On-Site	Yes	**Vehicle Type(s):** Island Explorer (bus)		**Fleet Size** 17	**Comments** operate over 8 routes
511 Program	Yes	**511 Coverage** statewide	**Status** Under Development	**Comments**	

External architecture nearby? Yes   **Unit included in the external architecture?** Yes   **Inclusion on-going or project-specific?** No info yet   **Scope** Statewide

Name: Maine Statewide ITS Architecture   **Comments**

Project Information

Title: **Improve Acadia VTS Infrastructure**   Contact   Len Babinchock   (207) 288-8701

Description: Purchase & install electronic destination signs in 17 Island Explorer buses

Purpose Reduce confusion about route and direction of Island Explorer buses

Park Functions Travel Information; Congestion Management

Services (Existing or Projected)

Phase Implementation

PMIS or Project# 62922

Initial Planned FY 2002   **Requested Fund FY** 2003

Total Cost	$622,357
ITS Component(s)	**$622,357**
Fund Request	$622,357

Funded? Yes   **Year Funded:**

In-Vehicle Electronic Information

Title: **Acadia Visitor Transportation System**   Contact   Len Babinchock   (207) 288-8701

Description: Coordinate ITS Strategies

Purpose Planning to coordinate integration of the DOT/DOI ITS projects into daily explorer operations

Park Functions Travel information; Coordinate transit operations

Services (Existing or Projected)

Phase Planning

PMIS or Project# 98718

Initial Planned FY   **Requested Fund FY** 2005

Total Cost	$42,230
ITS Component(s)	**$3,280**
Fund Request	$42,230

Funded? Yes   **Year Funded:**

Integrate ITS with local DOTs
Vehicle Tracking System

Title: **Acadia Visitor Transportation System**   Contact   Len Babinchock   (207) 288-8701

Description: Planning component

Purpose Assist Acadia & Down Transportation with implementation and evaluation plan for ITS fleet management and traveler information for the Island Explorer transit project.

Park Functions Travel information; Congestion management; Alternative Transport system/ options

Services (Existing or Projected)

Phase Planning

PMIS or Project# 98719

Initial Planned FY   **Requested Fund FY** 2006

Total Cost	$43,870
ITS Component(s)	**$2,870**
Fund Request	$43,870

Funded? Yes   **Year Funded:**

Vehicle Tracking System
Integrate ITS with local DOTs

AGENCY REGION: Northeast

Acadia National Park

Title: **ITS Field Operations Test**

Contact   Len Babinchock   (207) 288-8701

Description: Improve existing systems transit and road-based infrastructure using ITS	**Phase** Implementation
	PMIS or Project# FLHD
Purpose	**Initial Planned FY** 2002 **Requested Fund FY**
	Total Cost $45,480
Park Functions Congestion Management; Travel Information	**ITS Component(s)** **$45,480**
	Fund Request $45,480
Services (Existing or Projected)	**Funded?** Yes **Year Funded:**

Trip Planning tools

Parking Management/Availability

Construction management/information

Reservation Systems

AGENCY REGION: Northeast

FLHD Region: **Northeast**
Location MD, DC

Baltimore-Washington Parkway

Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**	0	**Comments**
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	0	**Comments**
511 Program	Yes	**511 Coverage**	regional	**Status** Under Development		**Comments**

External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?** No info yet	**Scope** Statewide	

Name: CHART

Comments CHART = Coordinated Highways Action Response Team

Project Information

Title: Traffic Information System

Contact   Charles Borders   (202) 619-7455

PMIS or Project# FLHD-BAWA

Description: Traffic monitoring system: traffic surveillance

Phase Implementation

Purpose

Initial Planned FY   **Requested Fund FY**

Total Cost

ITS Component(s)

Park Functions Travel Information; Traffic Information

Fund Request

Funded?   **Year Funded:**

Services (Existing or Projected)

Traffic Monitoring System

AGENCY REGION: Northeast

FLHD Region: **Northeast**

Cape Cod National Sea Shore

Location **MA**

Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
511 Program	Yes	**511 Coverage**	regional	**Status** Under Development	**Comments**	

External architecture nearby? Yes

Unit included in the external architecture? Yes

Inclusion on-going or project-specific? Project Speci

Scope Regional

Name: SE Massachusetts

Comments

Project Information

Title: **Procure ITS Components, Develop Transportation Modeling and Initiate DO12 Compliance for CACO**

Contact Ben Pearson (508) 349-3785

Description: System procurements, system compliance development

Phase Implementation

PMIS or Project# 89465

Purpose

Initial Planned FY 2003 **Requested Fund FY** 2004

Total Cost	$1,659,000
ITS Component(s)	**$1,499,000**

Park Functions Travel information

Fund Request $1,659,000

Services (Existing or Projected)

Funded? Yes **Year Funded:**

Integrate ITS with local DOTs
Traffic Monitoring System
Travel Information--undetermined
Vehicle Tracking System

Title: **Design and Concept**

Contact

Description: Design, conceptual drawings and planning

Phase Planning

PMIS or Project# 89966

Purpose

Initial Planned FY **Requested Fund FY**

Total Cost	$441,263
ITS Component(s)	

Park Functions Roadway Management; Alternative Transport system/ options

Fund Request $441,263

Services (Existing or Projected)

Funded? Yes **Year Funded:**

Highway Advisory Radio
Trip Planning tools
Parking Management/Availability
ITS Needs Assessment

Title: **Equipment Acquisition -- Variable Messaging Sign**

Contact

Description: Purchase and install variable message sign

Phase Implementation

PMIS or Project# 98464

Purpose

Initial Planned FY 2004 **Requested Fund FY**

Total Cost	$25,000
ITS Component(s)	**$25,000**

Park Functions Travel Information

Fund Request

Services (Existing or Projected)

Funded? No **Year Funded:**

Variable/Changeable Message Signs

AGENCY REGION: Northeast

FLHD Region: **Northeast**
Location **MA**

Cape Cod National Sea Shore

Managing Agency: **National Park Service**

Title: **Operate Little Creek Staging Area Beach Shuttle**

Contact   Kevin Fitzgerald   (508) 349-3785

Description: Variable message sign at Nauset Road & Highway 6	**Phase** Implementation **PMIS or Project#** 98464

Purpose

Initial Planned FY 2004   **Requested Fund FY** 2004

Park Functions Travel Information

Total Cost	$47,600
ITS Component(s)	**$37,000**
Fund Request	$37,000

Services (Existing or Projected)

Funded?   No   **Year Funded:**

Variable/Changeable Message Signs

Reported ITS Applications at National Parks

AGENCY REGION: Northeast

Gateway National Recreation Area

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
511 Program	Yes	**511 Coverage**	regional	**Status** Ready for Use	**Comments**	covered by TRANSCOM area; Newark area

External architecture nearby? No	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?**	**Scope**
Name:		**Comments**	

Project Information

Title: Realign Sandy Hook Park Entrance and Fee Plaza Area

Contact   Rick Dorrance   (732) 872-5923

Description: Automated fee collection at main entrance, possible consolidation of dispatch center and parking management

Phase Planning

PMIS or Project# 59181

Purpose

Initial Planned FY   **Requested Fund FY**

Total Cost $1,763,774

ITS Component(s)

Park Functions Congestion Management

Fund Request $1,763,774

Funded? Yes   **Year Funded:**

Services (Existing or Projected)

Highway Advisory Radio
Variable/Changeable Message Signs
Automated Entry System

Title: Sandy Hook Traveler Information System & Parking Management Plan

Contact   Rick Dorrance   (732) 872-5923

Description: Purchase equipment and 'trailers' for traveler information system; parking management study; purchase cameras for traffic monitoring

Phase Implementation

PMIS or Project# 62552

Purpose Congestion management; improvements to flow, capacity, configuration, and monitoring of traffic and parking areas

Initial Planned FY 2001   **Requested Fund FY** 2001

Total Cost $131,000

ITS Component(s)   **$131,000**

Park Functions Travel information; Parking Management

Fund Request $131,000

Funded? Yes   **Year Funded:**

Services (Existing or Projected)

Parking Management/Availability
ITS Needs Assessment

Title: Fee Automation Study and Implementation Plan

Contact   Tadgh McNamee   (732) 872-5918

Description: Automated fee collection at main entrance, possible consolidation of dispatch center and parking management

Phase Planning

PMIS or Project# 92595

Purpose

Initial Planned FY   **Requested Fund FY**

Total Cost $310,000

ITS Component(s)   **$310,000**

Park Functions Congestion Management

Fund Request $310,000

Funded? Yes   **Year Funded:**

Services (Existing or Projected)

Automated Entry System

AGENCY REGION: Northeast

FLHD Region: **Northeast**

Location **DC**

George Washington Memorial Parkway

Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**		**Fleet Size**		**Comments**
ATS On-Site	No	**Vehicle Type(s):**	n/a	**Fleet Size**	0	**Comments**
511 Program	Yes	**511 Coverage**	regional	**Status** Under Development		**Comments**

External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?** Long-term	**Scope** Regional	
Name: DC CapWIN/CapCOM		**Comments**		

Project Information

Title: **Rehabilitation of the GW Parkway**   Contact

Description:	ITS applications during rehabiliation	**Phase** Planning	**PMIS or Project#**	FLHD-GWM P
Purpose	Speeding along the route; …	**Initial Planned FY**	**Requested Fund FY**	
		Total Cost		
		ITS Component(s)		
Park Functions	Travel Information; Public Safety; Emergency Management; Incident Management	**Fund Request**		
Services (Existing or Projected)		**Funded?** External	**Year Funded:**	

Integrate ITS with local DOTs

Traffic Monitoring System

Weather/Road Condition Information

Work Zone Management

Construction management/information

AGENCY REGION: Northeast

FLHD Region: **Northeast**

Location **PA**

Gettysburg National Military Park

Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**	n/a		**Fleet Size** 0	**Comments**	
ATS On-Site	No	**Vehicle Type(s):**			**Fleet Size**	**Comments**	

511 Program	Yes	**511 Coverage** regional	**Status** Nearby State	**Comments**	Baltimore area covered; PA areas under development

External architecture nearby? No	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?**	**Scope**
Name:		**Comments**	

Project Information

Title: **ATS improvements**   Contact

Description: Traveler information and fleet management of ATS	**Phase** Planning
	PMIS or Project# GETT?
Purpose	**Initial Planned FY** **Requested Fund FY**
	Total Cost
Park Functions Travel Information; Fleet Management	**ITS Component(s)**
	Fund Request
Services (Existing or Projected)	**Funded?** Yes **Year Funded:**

Travel Information -- Unspecified

Fleet Management

Parking Management/Availability

AGENCY REGION: Northeast

FLHD Region: **Northeast**

Location **DC**

National Capitol Parks-Central

Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
ATS On-Site	Yes	**Vehicle Type(s):**		**Fleet Size**	**Comments**	Tour-mobile (bus)

511 Program	Yes	**511 Coverage**	regional	**Status**	Under Development	**Comments**

External architecture nearby?	Yes	**Unit included in the external architecture?**	Yes	**Inclusion on-going or project-specific?**	Long-term	**Scope**	Regional

Name: DC CapWIN/CapCOM   **Comments**

Project Information

Title: **Alternative Visitor Transportation System -- Implementation**

Contact   Alexa Viets   (202) 485-9877

Description: Travel Information	**Phase** Implementation **PMIS or Project#** 89063
Purpose	**Initial Planned FY** 2006 **Requested Fund FY** 2006
	Total Cost $57,200,000
Park Functions Congestion Management; Travel Information	**ITS Component(s)** **$11,200,000**
	Fund Request $57,200,000
Services (Existing or Projected)	**Funded?** **Year Funded:**

Incident Management System
ITS Needs Assessment
Traffic Monitoring System
Travel Information -- Unspecified
Trip Planning tools

AGENCY REGION: Northeast

Northeast Regional Office

FLHD Region: **Northeast**
Location **MA**
Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
ATS On-Site	Yes	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
511 Program	Yes	**511 Coverage**	regional	**Status** Under Development	**Comments**	

External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?** Long-term	**Scope** Local/Metro

Name: Boston area ITS architecture   **Comments** under development; expected completion spring 2005

Project Information

Title: **Information Plan (ITS and Signage)**

Contact   Marjorie Smith   (617) 223-5133

Description: Study and plan for improved information services to facilitate the use of public transportation to access NPS and partner sites in and around Boston Harbor

Purpose Reduce confusion of newcomers; increase patronage for those without cars; reduce traffic congestion; address inadequate parking

Park Functions Congestion Management; Parking Management; Travel Information

Services (Existing or Projected)

Interpretive Signage
Trip Planning tools

Phase Planning

PMIS or Project# 63647

Initial Planned FY 2001   **Requested Fund FY** 2001

Total Cost	$135,000
ITS Component(s)	**$135,000**
Fund Request	$135,000

Funded? Yes   **Year Funded:**

Title: **National Parks of Massachusetts Traveler Information System & Visitor Transportation Facilities**

Contact

Description: Traveler Information System-- web-based with possible information kiosk component

Purpose Reduce confusion of newcomers; increase patronage for those without cars; reduce traffic congestion; address inadequate parking

Park Functions Travel Information

Services (Existing or Projected)

Interpretive Signage
Trip Planning tools

Phase Complete

PMIS or Project# 63647

Initial Planned FY 2001   **Requested Fund FY**

Total Cost	$266,000
ITS Component(s)	
Fund Request	

Funded?   **Year Funded:**

AGENCY REGION: Northeast

FLHD Region: **Northeast**

Location **NY**

Statue of Liberty National Monument

Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**	Ferry		**Fleet Size**	**Comments**	
ATS On-Site	No	**Vehicle Type(s):**			**Fleet Size**	**Comments**	

511 Program	Yes	**511 Coverage**	regional	**Status**	Ready for Use	**Comments**

External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?** No info yet	**Scope** Local/Metro

Name: New York/New Jersey TransCOM   **Comments**

Project Information

Title: **Real-time Visitor Information**   Contact

Description: Real-time visitor information at site	**Phase** Planning	**PMIS or Project#** Ext-STLI?
Purpose	**Initial Planned FY** **Requested Fund FY**	
	Total Cost	
Park Functions Travel Information	**ITS Component(s)**	
	Fund Request	
Services (Existing or Projected)	**Funded?** **Year Funded:**	

ITS Needs Assessment
Travel Information Kiosks

AGENCY REGION: PacificWest

Golden Gate National Recreation Area

FLHD Region:	**West**
Location	**CA**
Managing Agency:	**National Park Service**

Transit Access	Yes	**Vehicle Type(s):**			**Fleet Size**	**Comments**	multiple carriers, multiple destinations
ATS On-Site	Yes	**Vehicle Type(s):**			**Fleet Size**	**Comments**	
511 Program	Yes	**511 Coverage**	statewide; regional	**Status** Ready for Use		**Comments**	Golden Gate does not currently participate in 511 coverage area

External architecture nearby? Yes	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?** No info yet	**Scope** Regional	

Name: San Francisco Bay Area Regional Intelligent Tr   **Comments**

Project Information

Title: **ITS "Early Winner" Pilot Project**   Contact   Amy Ford

Description: Operational plan for portable changeable message signs	**Phase** Planning
	PMIS or Project# Ext-GOGA 2
Purpose	**Initial Planned FY** **Requested Fund FY**
	Total Cost
	ITS Component(s)
Park Functions Travel Information; Congestion Management	**Fund Request** $0
Services (Existing or Projected)	**Funded?** Yes **Year Funded:** 2005

511 System Integration
Highway Advisory Radio
Integrate ITS with local DOTs
ITS Needs Assessment
Parking Management/Availability
Traffic Monitoring System
Transit Management
Travel Information -- Unspecified
Trip Planning tools
Variable/Changeable Message Signs
Weather/Road Condition Information

Title: **ITS Applications in Golden Gate National Recreation Area**   Contact

Description: In close coordination with GGNRA's long term transportation planning efforts, WTI/MSU is researching the feasibility of ITS applications to promote system efficiency, transit utilization and applications.	**Phase** Planning
	PMIS or Project# GG-ITS
	Initial Planned FY 0 **Requested Fund FY** 0
Purpose	
	Total Cost $70,000
Park Functions	**ITS Component(s)** $0
	Fund Request $0
Services (Existing or Projected)	**Funded?** **Year Funded:**

ITS Needs Assessment

AGENCY REGION: PacificWest

Lewis & Clark National Historical Park

FLHD Region: **West**
Location)R, WA
Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**	Bus	**Fleet Size**	**Comments**	Lewis & Clark Explorer Shuttle available mid-June through Labor Day

ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**

511 Program	No	**511 Coverage**	**Status**	**Comments**

External architecture nearby?	Yes	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?**	No info yet	**Scope** Statewide

Name: Oregon Regional Intelligent Transportation Syst   **Comments**

Project Information

Title: **Lewis & Clark Explorer Shuttle System**   Contact   Pete Field   (360) 619-7619

Description: Highway Advisory Radio, other visitor information system

Phase Implementation   **PMIS or Project#** ODOT

Purpose

Initial Planned FY   **Requested Fund FY**

Total Cost

ITS Component(s)

Park Functions Travel Information; Roadway Management

Fund Request $0

Funded? External   **Year Funded:** 2004

Services (Existing or Projected)

Incident Management System
Integrate ITS with local DOTs
Travel Information -- Unspecified
Variable/Changeable Message Signs
Highway Advisory Radio

AGENCY REGION: PacificWest
Mount Rainier National Park

FLHD Region: **West**
Location **WA**
Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**

511 Program	Yes	**511 Coverage**	statewide	**Status** Ready for Use	**Comments**

External architecture nearby? Yes	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?** No info yet	**Scope** Regional

Name: Puget Sound Regional Intelligent Transportatio

Comments includes Mount Rainier National Park as regional stakeholder; abuts Olympic National Park

Project Information

Title: **Restore Westside Road Visitor Access (w/ Shuttle Service)**

Contact Eric J. Walkinshaw (360) 569-2166

Description: ITS Considerations

Purpose

Park Functions Congestion Management; Travel Information

Services (Existing or Projected)

ITS Needs Assessment

Phase Planning	**PMIS or Project#** 82403

Initial Planned FY 2004 **Requested Fund FY** 2005

Total Cost	$478,178
ITS Component(s)	**$200,000**
Fund Request	$478,178

Funded? Yes   **Year Funded:**

Title: **Establish ITS for Mt. Rainier National Park -- Denver Service Center Project Support Costs**

Contact

Description: Establish Intelligent Transportation System

Purpose

Park Functions Congestion Management; Travel Information

Services (Existing or Projected)

ITS Needs Assessment

Phase Planning	**PMIS or Project#** 87394

Initial Planned FY 2005 **Requested Fund FY**

Total Cost	$13,523
ITS Component(s)	**$13,523**
Fund Request	

Funded? Yes   **Year Funded:**

AGENCY REGION: PacificWest

FLHD Region: **West**

Location **WA**

Mount Saint Helens National Volcanic Monume Managing Agency: **US Forest Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
511 Program	Yes	**511 Coverage**	statewide	**Status**	Ready for Use	**Comments**

External architecture nearby? No	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?**	**Scope**
Name:		**Comments**	

Project Information

Title: **Mount St. Helens Travel Information Systems**

Contact   Michael Brower   (360) 753-9550

Description: Traveler Information Systems

Phase Planning

PMIS or Project# FLHD-MTSH

Purpose

Initial Planned FY 2002   **Requested Fund FY**

Total Cost $496,380

ITS Component(s)   **$248,190**

Park Functions Travel Information

Fund Request

Services (Existing or Projected)

Funded?   Yes   **Year Funded:**

Travel Information--undetermined

AGENCY REGION: PacificWest

Olympic National Park

FLHD Region: **West**
Location **WA**
Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**	Bus; Ferry	**Fleet Size**	**Comments**
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**

511 Program	Yes	**511 Coverage**	statewide	**Status**	Ready for Use	**Comments**

External architecture nearby? No   **Unit included in the external architecture?** No   **Inclusion on-going or project-specific?** No info yet   **Scope** Regional

Name: Puget Sound Regional Intelligent Transportatio

Comments includes Mount Rainier National Park as regional stakeholder; abuts Olympic National Park

Project Information

Title: **Port Angeles, Washington Traveler Information System**

Contact   Michael Brower   (360) 753-9550

Description: Comprehensive Traveler Information System

Purpose

Park Functions Travel Information

Services (Existing or Projected)

Phase Planning

PMIS or Project# FLHD-OLYM

Initial Planned FY 2000   **Requested Fund FY**

Total Cost $495,000
ITS Component(s) **$395,735**
Fund Request

Funded? Yes   **Year Funded:**

Weather/Road Condition Information
Integrate ITS with local DOTs
Highway Advisory Radio
Travel Information--undetermined
ITS Needs Assessment

AGENCY REGION: PacificWest

Sequoia and Kings Canyon National Park

FLHD Region: **West**
Location **CA**
Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**		**Comments**	
ATS On-Site	Yes	**Vehicle Type(s):**		**Fleet Size**		**Comments**	No fee

511 Program	Yes	**511 Coverage**	statewide	**Status**	Under Development	**Comments**	unclear if Park participates

External architecture nearby? No	**Unit included in the external architecture?** No	**Inclusion on-going or project-specific?**	**Scope**
Name:		**Comments**	

Project Information

Title: **Expand Giant Forest Transportation System**

Contact   William Tweed   (559) 565-3130

Description:	Parking Management System	**Phase** Planning	**PMIS or Project#** 88850
Purpose		**Initial Planned FY** 2004 **Requested Fund FY** 2004	
		Total Cost	$8,000,600
Park Functions	Parking Management; Congestion Management; Travel Information	**ITS Component(s)**	**$170,000**
		Fund Request	$8,000,600
Services (Existing or Projected)		**Funded?** Yes **Year Funded:**	

Parking Management/Availability

Automated Entry System

Fleet Management

Highway Advisory Radio

Weather/Road Condition Information

Variable/Changeable Message Signs

Reported ITS Applications at National Parks

.**AGENCY REGION: PacificWest**

Yosemite National Park

			FLHD Region: **West**
			Location **CA**
		Managing Agency:	**National Park Service**

Transit Access	Yes	Vehicle Type(s):	Bus: YARTS; VIA	Fleet Size		Comments	
ATS On-Site	Yes	Vehicle Type(s):		Fleet Size	14	Comments	long-term plans call for 48-bus fleet to connect to parking areas just outside the Valley

511 Program	Yes	511 Coverage	statewide	Status	Ready for Use	Comments	unclear if Park participates; splits "live" and "pending" area

External architecture nearby? No	Unit included in the external architecture? No	Inclusion on-going or project-specific?	Scope
Name:		Comments	

Project Information

Title: **Replace Traffic Information System & Complete Circulation Analysis**

Contact (209) 379-1035

Description: Replace traffic information system and complete circulation analyst

Purpose Maximize efficient management of transportation infrastructure; minimizes impacts to natural resources; reduce traffic congestion

Park Functions Travel Information; Public Safety; Roadway Management

Phase Planning — **PMIS or Project#** 56098

Initial Planned FY 2000 **Requested Fund FY** 2000

Total Cost $990,080
ITS Component(s) **$990,080**

Fund Request $990,080

Funded? Yes **Year Funded:**

Services (Existing or Projected)

Traffic Monitoring System
Travel Information--undetermined
Weather/Road Condition Information
Fleet Management
Reservation Systems
Highway Advisory Radio
Integrate ITS with local DOTs
ITS Needs Assessment

Title: **Variable Message Signage**

Contact

Description: Variable Message Signs on major approach roads

Purpose

Park Functions Travel Information; Congestion Management

Phase Complete — **PMIS or Project#** CalTrans

Initial Planned FY **Requested Fund FY**

Total Cost
ITS Component(s)

Fund Request $0

Funded? External **Year Funded:**

Services (Existing or Projected)

Variable/Changeable Message Signs

.

AGENCY REGION: PacificWest

Yosemite National Park

FLHD Region: **West**
Location **CA**
Managing Agency: **National Park Service**

Title: **Yosemite National Park Vehicle Management Study System**

Contact

Description: The purpose of this project is to research effective Vehicle Management Systems to manage entry of vehicles in YNP and the movement of vehicles within the park.	**Phase** Planning

PMIS or Project# YOS-VM

Initial Planned FY 0   **Requested Fund FY** 0

Purpose

	Total Cost $70,000
ITS Component(s)	**$0**
Park Functions	
Fund Request	$0

Funded?   **Year Funded:**

Services (Existing or Projected)

Automated Entry System

Vehicle Management System

Reported ITS Applications at National Parks

AGENCY REGION: Southeast

FLHD Region: **South Gulf**
Location **KY**

Cumberland Gap National Park

Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**	n/a	**Fleet Size** 0	**Comments**
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments** When park staff are available, shuttle to Overlook can be arranged. $3 per person. Seasonal shuttle to Hensley Settlement available.

511 Program	Yes	**511 Coverage** statewide; regional	**Status** Ready for Use	**Comments**	
External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?** Long-term	**Scope** Local/Metro		
Name: US 25E Corridor		**Comments**			

Project Information

Title: Cumberland Gap Tunnel

Contact Deanna Phillips (606) 246-1060

Description: Tunnel Control and Operations Center

Phase Complete

PMIS or Project# Ext-CUGA

Purpose

Initial Planned FY **Requested Fund FY**

Total Cost $280,000,000

Park Functions Public Safety; Traffic Management; Roadway Management

ITS Component(s)

Fund Request

Services (Existing or Projected)

Funded? External **Year Funded:**

Traffic Monitoring System
Variable/Changeable Message Signs
Incident Management System
Trip Planning tools
Highway Advisory Radio

AGENCY REGION: Southeast

FLHD Region: **South Gulf**
Location **TN, NC**

Great Smoky Mountains National Park

Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**	Trolley	**Fleet Size**	**Comments**	
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	**Comments**	
511 Program	Yes	**511 Coverage**	statewide	**Status** Ready for Use	**Comments** TN launch expected 2005	

External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?** No info yet	**Scope** Regional

Name: Knoxville Regional ITS Architecture   **Comments**

Project Information

Title: **Design Cades Cove Alternative Transportation -- Phase II**

Contact   Shawn Benge   (865) 436-1237

Description:	ITS for road corridor improvements	**Phase** Implementation	**PMIS or Project#** 83095
Purpose		**Initial Planned FY** 2005	**Requested Fund FY** 2005
		Total Cost	$1,558,315
		ITS Component(s)	**$130,000**
Park Functions	Travel Information; Public Safety; Congestion Management	**Fund Request**	$482,500
		Funded? Yes	**Year Funded:**
Services (Existing or Projected)			

511 System Integration

Highway Advisory Radio

Integrate ITS with local DOTs

In-Vehicle Electronic Information

Parking Management/Availability

Travel Information Kiosks

Trip Planning tools

Vehicle Tracking System

Weather/Road Condition Information

Title: **Design Cades Cove Alternative Transportation -- Phase III**

Contact   Shawn Benge   (865) 436-1237

Description:	First Phase of ITS implementation	**Phase** Implementation	**PMIS or Project#** 83095
Purpose		**Initial Planned FY** 2006	**Requested Fund FY** 2006
		Total Cost	$1,558,315
		ITS Component(s)	**$153,750**
Park Functions	Travel Information; Public Safety	**Fund Request**	$1,075,814
		Funded? Yes	**Year Funded:**
Services (Existing or Projected)			

Highway Advisory Radio

Weather/Road Condition Information

Integrate ITS with local DOTs

In-Vehicle Electronic Information

Parking Management/Availability

Travel Information Kiosks

Trip Planning tools

Vehicle Tracking System

511 System Integration

AGENCY REGION: Southeast

FLHD Region: **South Gulf**
Location **FL, MS**

Gulf Islands National Seashore

Managing Agency: **National Park Service**

Transit Access	Yes	**Vehicle Type(s):**	Bus; Ferry	**Fleet Size**	0	**Comments** Coast Side Transit Authority
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	0	**Comments**

511 Program	No	**511 Coverage**	**Status**	**Comments**

External architecture nearby? Yes	**Unit included in the external architecture?** Yes	**Inclusion on-going or project-specific?** Long-term	**Scope** Local/Metro

Name: Pensacola Urban Area Intelligent Transportatio   **Comments**

Project Information

Title: Variable Message Signs   Contact   J.D. Lee   (850) 934-2615

Description: Variable Message Signs	**Phase** Complete **PMIS or Project#** Ext-GUIS
Purpose	**Initial Planned FY** **Requested Fund FY**
	Total Cost $200,000
Park Functions Travel Information; Public Safety	**ITS Component(s)** **$200,000**
	Fund Request $200,000
Services (Existing or Projected)	**Funded?** Yes **Year Funded:** 2000

Variable/Changeable Message Signs
Parking Management/Availability
Incident Management System

AGENCY REGION: Southeast

FLHD Region **South Atlantic**
Location **MS, TN**

Natchez Trace Parkway

Managing Agency: **National Park Service**

Transit Access	No	**Vehicle Type(s):**		**Fleet Size**	0	**Comments**
ATS On-Site	No	**Vehicle Type(s):**		**Fleet Size**	0	**Comments**
511 Program	No	**511 Coverage**	**Status**			**Comments**

External architecture nearby? No	**Unit included in the external architecture?**	No	**Inclusion on-going or project-specific?**	**Scope**
Name:			**Comments**	

Project Information

Title: **Travelers Information Stations**   Contact   Stennis Young   (662) 680-4005

Description: Traveler Information Stations	**Phase** Complete **PMIS or Project#** Ext-grant
	Initial Planned FY **Requested Fund FY**
Purpose	**Total Cost** $50,000
	ITS Component(s) **$50,000**
Park Functions Travel Information; Public Safety	**Fund Request** $0
	Funded? External **Year Funded:** 1995
Services (Existing or Projected)	

Travel Information Kiosks
Trip Planning tools

Summary of ITS Projects by Park/Unit

Acadia National Park

Construction management/information

Integrate ITS with local DOTs

In-Vehicle Electronic Information

Parking Management/Availability

Reservation Systems

Trip Planning tools

Vehicle Tracking System

Allegheny Portage Railroad National Historic Site

Fleet Management

ITS Needs Assessment

Arches National Park

511 System Integration

Automated Entry System

Highway Advisory Radio

ITS Needs Assessment

Parking Management/Availability

Reservation Systems

Trip Planning tools

Baltimore-Washington Parkway

Traffic Monitoring System

Blackstone River Valley National Heritage Corridor

ITS Needs Assessment

Travel Information--undetermined

Bryce Canyon National Park

511 System Integration

Automated Entry System

Interpretive Signage

Parking Management/Availability

Transit Management

Variable/Changeable Message Signs

Cape Canaveral National Seashore

ITS Needs Assessment

Summary of ITS Projects by Park/Unit

Cape Cod National Sea Shore

Highway Advisory Radio

Integrate ITS with local DOTs

ITS Needs Assessment

Parking Management/Availability

Traffic Monitoring System

Travel Information--undetermined

Trip Planning tools

Variable/Changeable Message Signs

Variable/Changeable Message Signs

Vehicle Tracking System

Cumberland Gap National Park

Highway Advisory Radio

Incident Management System

Traffic Monitoring System

Trip Planning tools

Variable/Changeable Message Signs

Gateway National Recreation Area

Automated Entry System

Highway Advisory Radio

ITS Needs Assessment

Parking Management/Availability

Variable/Changeable Message Signs

George Washington Memorial Parkway

Construction management/information

Integrate ITS with local DOTs

Traffic Monitoring System

Weather/Road Condition Information

Work Zone Management

Gettysburg National Military Park

Fleet Management

Parking Management/Availability

Travel Information -- Unspecified

Summary of ITS Projects by Park/Unit

Glacier National Park

511 System Integration

Highway Advisory Radio

Integrate ITS with local DOTs

In-Vehicle Electronic Information

ITS Needs Assessment

Parking Management/Availability

Road Construction Information

Traffic Monitoring System

Transit Management

Travel Information -- Unspecified

Travel Information Kiosks

Variable/Changeable Message Signs

Vehicle Tracking System

Weather/Road Condition Information

Work Zone Management

Golden Gate National Recreation Area

511 System Integration

Highway Advisory Radio

Integrate ITS with local DOTs

ITS Needs Assessment

Parking Management/Availability

Traffic Monitoring System

Transit Management

Travel Information -- Unspecified

Trip Planning tools

Variable/Changeable Message Signs

Weather/Road Condition Information

Grand Canyon National Park

Automated Entry System

Highway Advisory Radio

Parking Management/Availability

Reservation Systems

Travel Information Kiosks

Trip Planning tools

Variable/Changeable Message Signs

Summary of ITS Projects by Park/Unit

Grand Teton National Park

Automated Entry System

Highway Advisory Radio

Parking Management/Availability

Reservation Systems

Travel Information Kiosks

Trip Planning tools

Variable/Changeable Message Signs

Great Smoky Mountains National Park

511 System Integration

Highway Advisory Radio

Integrate ITS with local DOTs

In-Vehicle Electronic Information

Parking Management/Availability

Travel Information Kiosks

Trip Planning tools

Vehicle Tracking System

Weather/Road Condition Information

Gulf Islands National Seashore

Incident Management System

Parking Management/Availability

Variable/Changeable Message Signs

Lewis & Clark National Historical Park

Highway Advisory Radio

Incident Management System

Integrate ITS with local DOTs

Travel Information -- Unspecified

Variable/Changeable Message Signs

Mount Rainier National Park

ITS Needs Assessment

Mount Saint Helens National Volcanic Monument

Travel Information--undetermined

Natchez Trace Parkway

Travel Information Kiosks

Trip Planning tools

Summary of ITS Projects by Park/Unit

National Capitol Parks-Central

Incident Management System

ITS Needs Assessment

Traffic Monitoring System

Travel Information -- Unspecified

Trip Planning tools

Northeast Regional Office

Interpretive Signage

Interpretive Signage

Trip Planning tools

Trip Planning tools

Olympic National Park

Highway Advisory Radio

Integrate ITS with local DOTs

ITS Needs Assessment

Travel Information--undetermined

Weather/Road Condition Information

Petrified Forest National Park

511 System Integration

Highway Advisory Radio

Rocky Mountain National Park

Automated Entry System

Sequoia and Kings Canyon National Park

Automated Entry System

Fleet Management

Highway Advisory Radio

ITS Needs Assessment

Parking Management/Availability

Variable/Changeable Message Signs

Weather/Road Condition Information

Service Wide

511 System Integration

Shenandoah National Park

Integrate ITS with local DOTs

Weather/Road Condition Information

Statue of Liberty National Monument

ITS Needs Assessment

Travel Information Kiosks

Summary of ITS Projects by Park/Unit

Yellowstone National Park

511 System Integration

Automated Entry System

Highway Advisory Radio

Travel Information Kiosks

Variable/Changeable Message Signs

Weather/Road Condition Information

Yosemite National Park

Fleet Management

Highway Advisory Radio

Integrate ITS with local DOTs

ITS Needs Assessment

Reservation Systems

Traffic Monitoring System

Travel Information--undetermined

Variable/Changeable Message Signs

Vehicle Management System

Weather/Road Condition Information

Zion National Park

511 System Integration

Automated Entry System

ITS Needs Assessment

Variable/Changeable Message Signs

Summary of ITS Projects by Service Type

511 System Integration 9

Park Name	ITS Component
Arches National Park	Comprehensive study of possible ITS applications
Bryce Canyon National Park	Purchase and install variable message sign
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs
Great Smoky Mountains National Park	First Phase of ITS implementation
Petrified Forest National Park	Travel information along I-40, includes Grand Canyon National Park and Petrified Forest National Park
Service Wide	Build a full featured, service-wide trip planner on NPS.gov
Yellowstone National Park	Develop 511 systems within park, including variable message signs, etc.; will be integrated with existing programs in Montana and upcoming programs in North & South Dakota, Wyoming and Idaho
Zion National Park	Signage and visitor information systems posted at I-15 and US 89

Automated Entry System 9

Park Name	ITS Component
Arches National Park	Comprehensive study of possible ITS applications
Bryce Canyon National Park	Install electronic gates for fee collection at Bryce Point Intersection
Gateway National Recreation Area	Automated fee collection at main entrance, possible consolidation of dispatch center and parking management
Grand Canyon National Park	Develop 511 systems within park through integration with Arizona DOT
Grand Teton National Park	Various applications during course of park-wide transportation improvements

Summary of ITS Projects by Service Type

Rocky Mountain National Park	Install a "Card Swipe" entry device for a special vehicle lane at the Beaver Meadows Entrance Station
Sequoia and Kings Canyon National Park	Parking Management System
Yellowstone National Park	As the second phase of the Greater Yellowstone Rural ITS Corridor, this project allows for the installation and evaluation of AVI at two entrances to Yellowstone National Park.
Zion National Park	Signage and visitor information systems posted at I-15 and US 89

Construction management/information   2

Park Name	ITS Component
Acadia National Park	Improve existing systems transit and road-based infrastructure using ITS
George Washington Memorial Parkway	ITS applications during rehabiliation

Fleet Management   4

Park Name	ITS Component
Allegheny Portage Railroad National Historic Site	Study ATS for 6-10 Trail & Staple Bend Tunnel
Gettysburg National Military Park	Traveler information and fleet management of ATS
Sequoia and Kings Canyon National Park	Parking Management System
Yosemite National Park	Replace traffic information system and complete circulation analyst

Highway Advisory Radio   15

Park Name	ITS Component
Arches National Park	Comprehensive study of possible ITS applications
Cape Cod National Sea Shore	Design, conceptual drawings and planning
Cumberland Gap National Park	Tunnel Control and Operations Center

Gateway National Recreation Area	Automated fee collection at main entrance, possible consolidation of dispatch center and parking management
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs
Grand Canyon National Park	Develop 511 systems within park through integration with Arizona DOT
Grand Teton National Park	Various applications during course of park-wide transportation improvements
Great Smoky Mountains National Park	First Phase of ITS implementation
Lewis & Clark National Historical Park	Highway Advisory Radio, other visitor information system
Olympic National Park	Comprehensive Traveler Information System
Petrified Forest National Park	Travel information along I-40, includes Grand Canyon National Park and Petrified Forest National Park
Sequoia and Kings Canyon National Park	Parking Management System
Yellowstone National Park	Install two variable message signs (VMS), a highway advisory radio (HAR) system, and a road-weather information system (RWIS)
Yosemite National Park	Replace traffic information system and complete circulation analyst

Incident Management System 4

Park Name	ITS Component
Cumberland Gap National Park	Tunnel Control and Operations Center
Gulf Islands National Seashore	Variable Message Signs
Lewis & Clark National Historical Park	Highway Advisory Radio, other visitor information system

Summary of ITS Projects by Service Type

National Capitol Parks-Central   Travel Information

Integrate ITS with local DOTs   10

Park Name	ITS Component
Acadia National Park	Coordinate ITS Strategies
Cape Cod National Sea Shore	System procurements, system compliance development
George Washington Memorial Parkway	ITS applications during rehabiliation
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs
Great Smoky Mountains National Park	First Phase of ITS implementation
Lewis & Clark National Historical Park	Highway Advisory Radio, other visitor information system
Olympic National Park	Comprehensive Traveler Information System
Shenandoah National Park	Review ITS strategies with regional & state orgs
Yosemite National Park	Replace traffic information system and complete circulation analyst

Interpretive Signage   3

Park Name	ITS Component
Bryce Canyon National Park	Interpretive Signing for ATS
Northeast Regional Office	Study and plan for improved information services to facilitate the use of public transportation to access NPS and partner sites in and around Boston Harbor
Northeast Regional Office	Traveler Information System-- web-based with possible information kiosk component

Summary of ITS Projects by Service Type

In-Vehicle Electronic Information 3

Park Name	ITS Component
Acadia National Park	Purchase & install electronic destination signs in 17 Island Explorer buses
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Great Smoky Mountains National Park	First Phase of ITS implementation

ITS Needs Assessment 15

Park Name	ITS Component
Allegheny Portage Railroad National Historic Site	Study ATS for 6-10 Trail & Staple Bend Tunnel
Arches National Park	Comprehensive study of possible ITS applications
Blackstone River Valley National Heritage Corridor	Study opportunities for use of ITS
Cape Canaveral National Seashore	Assess ITS needs
Cape Cod National Sea Shore	Design, conceptual drawings and planning
Gateway National Recreation Area	Purchase equipment and 'trailers' for traveler information system; parking management study; purchase cameras for traffic monitoring
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs
Mount Rainier National Park	ITS Considerations
National Capitol Parks-Central	Travel Information
Olympic National Park	Comprehensive Traveler Information System

Sequoia and Kings Canyon National Park	Study of ITS Themes
Statue of Liberty National Monument	Real-time visitor information at site
Yosemite National Park	Replace traffic information system and complete circulation analyst
Zion National Park	Signage and visitor information systems posted at I-15 and US 89

Parking Management/Availability   13

Park Name	ITS Component
Acadia National Park	Improve existing systems transit and road-based infrastructure using ITS
Arches National Park	Comprehensive study of possible ITS applications
Bryce Canyon National Park	Purchase and install variable message sign
Cape Cod National Sea Shore	Design, conceptual drawings and planning
Gateway National Recreation Area	Purchase equipment and 'trailers' for traveler information system; parking management study; purchase cameras for traffic monitoring
Gettysburg National Military Park	Traveler information and fleet management of ATS
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs
Grand Canyon National Park	Develop 511 systems within park through integration with Arizona DOT
Grand Teton National Park	Various applications during course of park-wide transportation improvements
Great Smoky Mountains National Park	First Phase of ITS implementation

Summary of ITS Projects by Service Type

Gulf Islands National Seashore   Variable Message Signs

Sequoia and Kings Canyon National Park   Parking Management System

Reservation Systems   5

Park Name	ITS Component
Acadia National Park	Improve existing systems transit and road-based infrastructure using ITS
Arches National Park	Comprehensive study of possible ITS applications
Grand Canyon National Park	Develop 511 systems within park through integration with Arizona DOT
Grand Teton National Park	Various applications during course of park-wide transportation improvements
Yosemite National Park	Replace traffic information system and complete circulation analyst

Road Construction Information   1

Park Name	ITS Component
Glacier National Park	Real-time traffic information during and after rehabilitation of Road

Traffic Monitoring System   8

Park Name	ITS Component
Baltimore-Washington Parkway	Traffic monitoring system: traffic surveillance
Cape Cod National Sea Shore	System procurements, system compliance development
Cumberland Gap National Park	Tunnel Control and Operations Center
George Washington Memorial Parkway	ITS applications during rehabiliation
Glacier National Park	Real-time traffic information during and after rehabilitation of Road

Summary of ITS Projects by Service Type

Golden Gate National Recreation Area	Operational plan for portable changeable message signs
National Capitol Parks-Central	Travel Information
Yosemite National Park	Replace traffic information system and complete circulation analyst

Transit Management 3

Park Name	ITS Component
Bryce Canyon National Park	Purchase and install variable message sign
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs

Travel Information -- Unspecified 5

Park Name	ITS Component
Gettysburg National Military Park	Traveler information and fleet management of ATS
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs
Lewis & Clark National Historical Park	Highway Advisory Radio, other visitor information system
National Capitol Parks-Central	Travel Information

Travel Information Kiosks 7

Park Name	ITS Component
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Grand Canyon National Park	Develop 511 systems within park through integration with Arizona DOT

Summary of ITS Projects by Service Type

Grand Teton National Park	Various applications during course of park-wide transportation improvements
Great Smoky Mountains National Park	First Phase of ITS implementation
Natchez Trace Parkway	Traveler Information Stations
Statue of Liberty National Monument	Real-time visitor information at site
Yellowstone National Park	Install two variable message signs (VMS), a highway advisory radio (HAR) system, and a road-weather information system (RWIS)

Travel Information--undetermined   5

Park Name	ITS Component
Blackstone River Valley National Heritage Corridor	Study opportunities for use of ITS
Cape Cod National Sea Shore	System procurements, system compliance development
Mount Saint Helens National Volcanic Monument	Traveler Information Systems
Olympic National Park	Comprehensive Traveler Information System
Yosemite National Park	Replace traffic information system and complete circulation analyst

Trip Planning tools   13

Park Name	ITS Component
Acadia National Park	Improve existing systems transit and road-based infrastructure using ITS
Arches National Park	Comprehensive study of possible ITS applications
Cape Cod National Sea Shore	Design, conceptual drawings and planning
Cumberland Gap National Park	Tunnel Control and Operations Center

Summary of ITS Projects by Service Type

Golden Gate National Recreation Area	Operational plan for portable changeable message signs
Grand Canyon National Park	Develop 511 systems within park through integration with Arizona DOT
Grand Teton National Park	Various applications during course of park-wide transportation improvements
Great Smoky Mountains National Park	First Phase of ITS implementation
Natchez Trace Parkway	Traveler Information Stations
National Capitol Parks-Central	Travel Information
Northeast Regional Office	Study and plan for improved information services to facilitate the use of public transportation to access NPS and partner sites in and around Boston Harbor
Northeast Regional Office	Traveler Information System-- web-based with possible information kiosk component

Variable/Changeable Message Signs 15

Park Name	ITS Component
Bryce Canyon National Park	Purchase and install variable message sign
Cape Cod National Sea Shore	Purchase and install variable message sign
Cape Cod National Sea Shore	Variable message sign at Nauset Road & Highway 6
Cumberland Gap National Park	Tunnel Control and Operations Center
Gateway National Recreation Area	Automated fee collection at main entrance, possible consolidation of dispatch center and parking management
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs

Summary of ITS Projects by Service Type

Grand Canyon National Park	Develop 511 systems within park through integration with Arizona DOT
Grand Teton National Park	Various applications during course of park-wide transportation improvements
Gulf Islands National Seashore	Variable Message Signs
Lewis & Clark National Historical Park	Highway Advisory Radio, other visitor information system
Sequoia and Kings Canyon National Park	Parking Management System
Yellowstone National Park	Install two variable message signs (VMS), a highway advisory radio (HAR) system, and a road-weather information system (RWIS)
Yosemite National Park	Variable Message Signs on major approach roads
Zion National Park	Signage and visitor information systems posted at I-15 and US 89

Vehicle Management System   1

Park Name	ITS Component
Yosemite National Park	The purpose of this project is to research effective Vehicle Management Systems to manage entry of vehicles in YNP and the movement of vehicles within the park.

Vehicle Tracking System   4

Park Name	ITS Component
Acadia National Park	Planning component
Cape Cod National Sea Shore	System procurements, system compliance development
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Great Smoky Mountains National Park	First Phase of ITS implementation

Weather/Road Condition Information   9

Park Name	ITS Component

George Washington Memorial Parkway	ITS applications during rehabiliation
Glacier National Park	Real-time traffic information during and after rehabilitation of Road
Golden Gate National Recreation Area	Operational plan for portable changeable message signs
Great Smoky Mountains National Park	First Phase of ITS implementation
Olympic National Park	Comprehensive Traveler Information System
Sequoia and Kings Canyon National Park	Parking Management System
Shenandoah National Park	Review ITS strategies with regional & state orgs
Yellowstone National Park	Install two variable message signs (VMS), a highway advisory radio (HAR) system, and a road-weather information system (RWIS)
Yosemite National Park	Replace traffic information system and complete circulation analyst

Work Zone Management   2

Park Name	ITS Component
George Washington Memorial Parkway	ITS applications during rehabiliation
Glacier National Park	Real-time traffic information during and after rehabilitation of Road

REPORT DOCUMENTATION PAGE

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1. REPORT DATE (DD-MM-YYYY) 19-01-2006	2. REPORT TYPE Final	3. DATES COVERED (From - To) NA

4. TITLE AND SUBTITLE

Intelligent Transportation Systems (ITS) in the NPS:
2005 Baseline Inventory and Preliminary Program Assessment

5a. CONTRACT NUMBER NA

5b. GRANT NUMBER NA

5c. PROGRAM ELEMENT NUMBER NA

6. AUTHOR(S)

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5d. PROJECT NUMBER HW1M

5e. TASK NUMBER NPS TIC No. D-1747

5f. WORK UNIT NUMBER NA

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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8. PERFORMING ORGANIZATION REPORT NUMBER

DOT-VNTSC-NPS-06-02

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

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10. SPONSOR/MONITOR'S ACRONYM(S)

WASO/TMP

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

(see 5d. and 5e. above)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Public distribution/availability.

13. SUPPLEMENTARY NOTES

This report addresses alternative transportation decision factors as indicated below (Y/N/NA):
(NA) Non-construction options; (NA) park carrying capacity; (NA) life-cycle/ops. & maintenance costs; (NA) cost-effectiveness.

14. ABSTRACT

This report presents the current status of Intelligent Transportation Systems (ITS) within the 398 national parks managed by the National Park Service (NPS), discusses the potential of ITS to address the often unique transportation challenges faced by NPS, outlines prospective research initiatives to further develop the understanding of the potential for beneficial application of ITS in national parks, and suggests programmatic strategies for further NPS consideration. A baseline inventory of ITS applications is included.

15. SUBJECT TERMS

Intelligent Transportation Systems, National Park, Traveler Information, Trip Planner, Parking Management, Automated Entry Systems, Traffic Monitoring and Management, Transit Information, Construction Work Zone Management, Weather Information

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE	NA	32	Gary T. Ritter, USDOT Volpe Center
None	None	None			19b. TELEPHONE NUMBER (Include area code) 617-494-2716