



# MANAGING CONGESTION: A TOOLKIT FOR PARKS

DECEMBER 2020



# Problem Area Cross-Reference Table

Category/Tool	PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		Contact Regional Transportation Coordinator	Page No.
	Parking Area Congestion	Entrance Station Congestion	Roadway Congestion*	Transit/Trail Congestion	Vehicle/Roadway Safety	Bicycle/Pedestrian Safety	Improves Visitor Experience	Improves Resource Conditions		
<b>BICYCLE/PEDESTRIAN</b>										
Bicycle/Pedestrian Facilities	○	○	●	○	●	●	●		●	6
Bike Share and Bike Rental	○	○	●	○			●			10
<b>DATA COLLECTION, ANALYSIS, AND MONITORING</b>										
Data Collection and Analysis	●	●	●	●	●	●	●	●	●	14
Special Event Management	●	●	●	●	●	●	●	●		18
<b>ENTRANCE STATION</b>										
Entrance Lanes/Stations/Booths		●	○				●		●	20
Limited Access Lanes at Entrances		●	○				●		○	22
No-Car Access Option	●	●	○		○		●		●	24
Prepayment of Fees		●		○			●			26
<b>LIMITED USE TOOL</b>										
Ridesharing	●	○	○				●			28
<b>OPERATIONS/ACCESS MANAGEMENT</b>										
Access Control	●	●	●		●	○	●	●	●	30
Automated Gate Restriction	○	●	●				●			32
Manage Visitor Timing and Distributions	●	●	●	●	●		●	●		34
Traffic Restrictions/Enforcement	●	●	●	○	●	●	●	●	○	36
Vehicle Size/Type Restrictions	●	●	●		●	●	●	●		38
Visitor Reservation Systems	●	●	●	●			●	●	●	40
<b>PARKING</b>										
Parking Fees	●						●		●	44
Parking Management	●		○		○		●	●		48
Parking Supply	●						●		●	50

\*NPS-owned/operated Internal roads unless otherwise noted    ● = Tool applies to problem area    ○ = Tool applies to problem area with exceptions

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<b>PLANNING</b>										
Congestion Assessment	●	●	●	●	●	●	●	●	●	52
Engage in Transportation Planning (DO 87D)	●	●	●	●	●	●	●	●	●	54
Engage with Partners, Stakeholders, and the Public	●	●	●	○	○	●	●			56
Road Safety Audit					●		●		●	58
Transportation Plan	●	●	●	●	●	●	●	●	●	60
Visitor Use Management Planning	●	●	●	●	●	●	●	●	●	62
<b>ROADWAY</b>										
Acceleration/Deceleration Lanes			●		●		●		●	64
Intersection Improvements		○	●		●	●	●		●	66
Road Capacity			●		●	○	●			68
Roadway Geometry Improvements	●	●	●	○	●	●	●		●	70
Roadway Pull-Outs			●		●	○	●	●	●	72
Traffic Calming			●		●	●	●		●	74
Traffic Circulation Changes	●	●	●	○	●	●	●		●	76
<b>TRANSIT/SHUTTLE/TOURS</b>										
Improve Existing Transit Services	●	●	●	●	○		●		●	78
Tour Bus Management	○	●	●	○	●		●	●	●	82
Transit/Shuttle Services	●	●	●		○		●		●	84
<b>VISITOR INFORMATION</b>										
Dynamic/Variable Message Signs	●	●	●		●	●	●		○	88
Intelligent Transportation Systems (ITS)	●	●	●	●	●	○	●		○	92

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<b>VISITOR INFORMATION</b>										
On-Site Visitor Congestion Information	○		●	●	●		●	●	○	<b>94</b>
Pre-Arrival Visitor Congestion Information	●	●	●	●	●	●	●	●	○	<b>96</b>
Signage and Wayfinding	●	●	●	●	●	●	●	●		<b>100</b>

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# Introduction

## Managing Congestion in National Parks

Congestion is a growing problem for parks across the National Park Service (NPS). Substantial congestion has been present in many parks for decades, while in some units it has only emerged as a problem recently. Parks may experience mild, moderate, or severe congestion conditions that vary by season or day of the week.

Congestion occurs when and where demand to access a site, parking area, entrance station, and/or roadway exceeds capacity. The most commonly congested places are parking areas. Congestion also occurs along roadways, at popular trailheads, at entrance stations, on buses, and at multimodal hubs.

When congestion occurred in parks through the 1990s, many parks added parking spaces, expanded the number of entrance stations, and/or added transit services. One counterintuitive lesson learned was that congestion often continued—and sometimes worsened—after adding capacity!

Once traffic congestion is persistent, a park has entered a new management era. This new era requires rethinking, and a holistic approach. A balance of operational changes, adjusting capacity (or using existing capacity more effectively), and adding capital investments will help parks invest wisely and minimize unintended consequences.

Major changes are underway in the transportation industry, and over the next 20 years parks will face changes in infrastructure needs and visitor management patterns. New arrival experiences for visitors in automated vehicles, greater availability of ridesharing services, and real time information pose both opportunities and risks for park operations, visitors, and resource preservation.



## Solve Issues While They're Small

The most common NPS priorities impacted by congestion are visitor experience, safety, park operations, and resource protection. This Toolkit can help parks tackle these issues with multiple tools that can be used individually or together and/or test using pilots.

### Types of Tools:

- Operational tools (managing on the ground, “good rangering” and pilots)
- Planning tools (congestion assessments, visitor use plans, transportation plans)
- Projects/capital improvement tools (adding capacity or transit)

### Categories of Tools:

- |  |                           |
|--|---------------------------|
| 1. Bicycle/Pedestrian                    | 6. Parking                |
| 2. Data Collection, Analysis, Monitoring | 7. Planning               |
| 3. Entrance Station                      | 8. Roadway                |
| 4. Limited Use                           | 9. Transit/Shuttles/Tours |
| 5. Operations/Access Management          | 10. Visitor Information   |

### IDENTIFY CONGESTION PROBLEMS FIRST

The Toolkit assumes the park is using a “problem first” approach to reducing congestion. That means park staff must first consider the types of congestion problems that need relief, where those problems occur, and when. The Toolkit begins with a Cross-Reference Table of Contents that is organized with problem areas at the top of each column, with each tool in a row, and indications of whether the tool addresses the problem area.

Next, parks can review and select one or more tools and move forward to implementation. Matching the park’s congestion problems with the right tools for the problem increases the chance for successful implementation and reduces the likelihood of unintended consequences.

Parks can work with the Toolkit on their own. If additional technical assistance is needed, parks contact their region or their partners to discuss next steps. Technical assistance may include a Congestion Assessment (short report done in 120 days or less), or a Visitor Use Management (VUM) Plan, and/or a transportation plan (typically several years to complete).



Figure 1: NPS Congestion Management Process

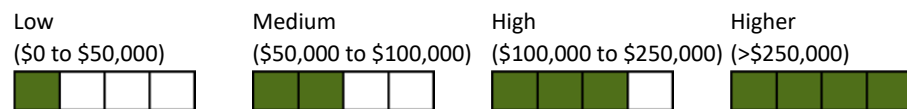
## Toolkit Organization

### COST, TIME, AND FACTORS THAT COULD INCREASE COST AND TIME

As parks explore the Toolkit, a key consideration is feasibility of each tool. Information on costs and time to implement is provided for each tool. The Toolkit uses straightforward bar graphics to communicate the typical amount for each of these. The typical costs reflected in the graphics are implementation costs.

Longer-term operations and maintenances costs are covered in the tool narrative. For all tools, the operations and maintenance costs should include staff time to monitor the impacts of the tool and adapt/retest as needed. Depending on the tool, these costs may include: data collection and reporting, evaluating recapitalization needs, modifying traffic/parking direction, or updating special event/incident command system (ICS) plans.

#### Sample of Costs Graphics:



#### Sample of Time Graphics



### IMPLEMENTATION CONSIDERATIONS

Since most congestion management tools have such a range of actions, it is not possible to predict a compliance pathway, especially considering the resource variables at each park. Every site and environment has unique circumstances that may trigger additional compliance requirements.

**General Disclaimer:** This Toolkit outlines proposed solutions for a variety of transportation and visitor issues related to congestion. None of the tools presented in this document have completed natural or cultural resource compliance or consultation. Prior to implementing any actions within this document, all natural and cultural resource compliance must be completed in accordance with all applicable laws and policies. ***It is the responsibility of the Superintendent to ensure the proper level of compliance has been completed prior to implementation.***

Prior to implementing any congestion management tools, all natural and cultural resource compliance must be completed in accordance with all applicable laws and policies. Compliance with other applicable laws, such as the Endangered Species Act, or Executive, Secretarial, and Director Orders must be evaluated when considering the use of a congestion management tool. If multiple actions have been implemented from this document, connected and cumulative impacts must be considered and addressed appropriately. The park should consider consulting the Regional Environmental Coordinator to discuss appropriate compliance pathways prior to implementation. In addition, conducting civic engagement with partners and the public may be wise to alert visitors, gateway communities and business of changes under consideration by the park (even if capital improvements are not under consideration). Park guidance documents (e.g., Superintendent's Compendium, general management plans, foundation documents, etc.) may be consulted for additional context.

Practically every tool in the Toolkit would trigger compliance since the project occurs on federal land, using federal funding, or requiring a federal permit. **Implementation of any tool must have the appropriate level of compliance led by subject-matter experts and consulting parties (SHPOs, tribes, stakeholders, etc.).**

### ADDITIONAL RESOURCES

This section provides examples of parks that have experience with the tool, as well as additional background materials such as guidebooks and studies directly related to the tool.

## The Art of Pilots

Pilot projects are experimental tests of park management actions on a limited scale, location, and time. They are particularly useful as a method of testing and learning and can be phased. Pilots can also improve relationships with stakeholders by quickly demonstrating a possible solution to improve visitor experience, resource protection, and traffic conditions in the gateway communities.

Any pilot project should fundamentally be:

- Small-scale
- Time limited and incremental
- Reversible
- Offer an opportunity for employee and stakeholder feedback
- Consider use of simulations as appropriate before investing in new infrastructure

Practical tips and considerations for using pilots:

- Develop a pilot action plan that includes:
  - purpose and goals
  - scope and timeline
  - activities and steps necessary to implement
  - stakeholder outreach
- Develop a monitoring and evaluation plan
- Include the National Environmental Policy Act (NEPA) and other compliance requirements
  - At least in a NEPA context, projects that have independent utility can be treated as separate decisions subject to the appropriate NEPA pathway. A project embedded in a study design with clear goals for process improvement would use that as a basis of for expressing the independent utility.

## Other Resources to Help Parks Manage Congestion

There are a number of other resources available to parks as they determine how to resolve congestion problems. The list below has some examples of where parks can go for information and guidance. It is not an exhaustive list and parks should always consider discussing congestion issues with the regional transportation coordinator.

### FUNDING RESOURCES

- **Federal Lands Transportation Program (FLTP)** – Funds from the Federal Highway Administration Office of Federal Lands Highway can be applied to congestion tool implementation based on fund source criteria. Category 1 funds are used for road and bridge projects. Category 3 funds cover alternative transportation projects. Five percent of planning funds are used for transportation planning efforts.
- **Federal Lands Access Program (FLAP)** – This is a competitively awarded program for nonfederal partners to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. A local match is required.
- **NPS Fees (Federal Lands Recreation Enhancement Act (FLREA))** – These NPS collected fees can be applied to congestion tool implementation based on fund source criteria.
- **Operation of the National Park System (ONPS)** – The ability of a park to apply ONPS funds to implementing a tool is context specific and requires certain approvals.
- **Partners/Stakeholders, including Friends groups.**





## Other Resources to Help Parks Manage Congestion

### TRANSPORTATION TECHNICAL SUPPORT RESOURCES

- **Regional Federal Lands Transportation Program (FLTP) Coordinators** – Each region has staff to manage the distribution of its allocation of funds from the FLTP. They can assist parks in developing transportation projects, provide guidance on fund sources, support the park with technical assistance from the resources listed below, and represent regional park perspectives in FLTP policy discussions.
- **Denver Service Center (DSC)** – NPS technical staff who provide support to regions and parks covering a variety of disciplines, including visitor use management, construction management, transportation planning, NEPA compliance, and resource management.
- **US DOT Volpe Center (Volpe)** – The Volpe staff provide transportation technical expertise in long-range planning, transit feasibility studies, transit vehicle technology analysis, Road Safety Audits, and Congestion Assessments.
- **Federal Highway Administration (FHWA) Office of Federal Lands Highway (FLH)** – FLH is a part of the FHWA and is divided into three divisions: Eastern, Central, and Western. FLH provides transportation planning, partner coordination, engineering, technical, and construction assistance for transportation assets that service the needs of federal and tribal lands.
- **Partners** – Parks can partner with many groups on transportation projects such as Friends groups, local governments, colleges and universities, and tourism boards.
- **Consultants** – The National Park Service can engage with private consulting firms to do a variety of tasks, including data collection and analysis and engineering studies. The Regional FLTP Coordinators can help parks bring in consulting firms to support their needs.

### OTHER HELPFUL RESOURCES

The National Park Service and other federal agencies have been addressing congestion and related issues for many years and have developed policies and frameworks based on their experience to help guide others.

- **Traffic Calming e-Primer** – The FHWA Office of Safety provides a thorough review of traffic calming measures in this online document. [https://safety.fhwa.dot.gov/speedmgmt/traffic\\_calm.cfm](https://safety.fhwa.dot.gov/speedmgmt/traffic_calm.cfm)
- **Active Transportation Guidebook** – References resources and solutions to manage vehicle congestion, promote resource preservation, and accommodate increased visitation by providing alternatives to driving. <https://www.nps.gov/subjects/transportation/bikeped.htm>
- **Visitor Use Management Framework** – The Interagency Visitor Use Management Council, which is made up of representatives from six US Federal Land Management Agencies (FLMAs), provides cohesive guidance for managing visitor use on federally managed lands and waters through a planning process. <https://visitorusemanagement.nps.gov/>
- **Visitor Use Management “Job Aid”** – <https://doimsp.sharepoint.com/sites/nps-vum/SitePages/Decision-Making-Job-Aid.aspx?csf=1&web=1&e=lrhUMy&CT=1610049070940&OR=OWA-NT&CID=c7c14608-750a-5fd8-c1f6-f37ebc1d3148>
- **Electronic Technical Information Center (eTIC)** – NPS Technical Information Service (TIC), the central repository for managing all NPS generated plans and technical reports.
- **Planning, Environment and Public Comment (PEPC) website** – NPS PEPC site provides links to various planning and environmental documents.



# Bicycle/Pedestrian Facilities



Allowing visitors to park in one location and walk or bicycle to other areas within the park to access major destinations removes vehicle trips from the roadways and reduces congestion. Using bicycle and pedestrian facilities beyond park boundaries to connect with communities or regional trails systems can reduce congestion at entrances stations as well as on park roads. Bicycle/pedestrian facilities include:

- Widened road shoulders or on-street bike lanes;
- Separated multiuse/nonmotorized paved pathways;
- Unpaved trails (these should follow Architectural Barriers Act and Americans with Disabilities Act standards); and
- Bridges and underpasses.

These facilities, designed specifically for bicycling or walking, improve the safety, comfort, and visitor experience for those using nonmotorized transportation.

Bicycle and pedestrian facilities within a park can serve as attractions, therefore serving dual recreation and transportation purposes. In some instances, parks may not allow bicycle use or prohibit use in certain sensitive areas. If such restrictions are in place, providing an option for secure bicycle storage should be considered.

## CATEGORY: Bicycle/Pedestrian



### Factors That Could Increase Cost and Time

Implementation of this tool generally costs \$100,000 to \$250,000 and takes one to three years to complete.

The expense and duration of implementing bicycle and pedestrian facilities will depend on whether the facilities will be incorporated into existing infrastructure, such as bicycle lanes on the road, or create new facilities like separated paved pathways.

Factors that could increase cost and time:

- Separated multiuse/nonmotorized paved pathways: costs vary considerably depending on the length and type of materials (natural surface, asphalt, or concrete), topography, design factors (accessibility, within an historic district etc.) and the need for culverts or bridges.
- Striping, lighting, and road edge treatments for on-street bike lanes.
- Off-site directional signage.
- Bicycle racks (on the ground or on buses), benches, and water fountains.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include maintenance such as debris cleaning, removing wildlife droppings, snow removal, restriping, and resurfacing of paved facilities.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- Bicycle Rulemaking Process (36 CFR 4.30)
- NPS *Management Policies 2006*, Chapter 9
- Director's Order (DO) 87A: *Park Roads and Parkways*
- DO 87B: *Alternative Transportation Systems*

# Bicycle/Pedestrian Facilities

## Implementation Considerations, cont.

### PROBLEM AREAS ADDRESSED / MANAGEMENT ISSUES

PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
○	○	●	○	●	●	●	-	●

### PROS

- Can shift auto traffic to alternative modes if visitors enter the park without a vehicle.
- Provides an alternative visitor experience to auto-touring.
- Offers the opportunity to expand access to outdoor activities (Healthy Parks, Healthy People).
- Can improve safety, comfort, and visitor experience for nonmotorized users, which may increase the use of pedestrian and cycling modes.
- Grade-separated facilities for motorized and nonmotorized traffic can further improve safety.

### CONS

- Additional parking area congestion may occur if visitors tend to park at a specific location (i.e., near park entrance or visitor center) to begin the bicycle/pedestrian portion of the trip.
- Bridges and underpasses used to facilitate the separation of transportation modes can be aesthetically unappealing and may have undesirable impacts to viewsheds or cultural landscapes.

### COORDINATION / PARTNERSHIPS

Coordination for new or expanded bicycle and pedestrian facilities should include local bicycle advocacy groups, local bicycle rental companies, gateway communities, and cultural and/or historic landscape experts and resource specialists. Partnering with local and regional groups can help leverage different funding and resources, mitigating some of the expense to the park.

### ADDITIONAL CONSIDERATIONS

- There are design considerations to weigh as a park implements a pedestrian/bicycle facility to connect major destinations. These include:
- Identify potential users (families, experienced versus recreational cyclists, etc.) to understand what types of facilities are appropriate
  - Bicycle parking can be co-located with visitor comfort stations
  - Wayfinding and lighting for nonmotorized facilities
  - Strong connections between roads, parking, transit hubs, and nonmotorized facilities
  - Universally accessible bicycle/pedestrian crossings for all users
  - Extra treatments (i.e., warning signs and pavement markings) where paths intersect roads and parking areas)
  - Sight distance
  - Bicycle rental or bicycle sharing facilities (see Bicycle Share and Bicycle Rentals)

# Bicycle/Pedestrian Facilities

## Implementation Considerations, cont.

### ADDITIONAL CONSIDERATIONS

- Types of bicycles, scooters, etc. to be allowed on the facilities (e-bikes, motorized vs. nonmotorized, possible time restrictions, etc.)
- Assess pedestrian/bike facility needs when doing road maintenance projects.

If a proposed trail will connect with trail facilities in a gateway community, design coordination will ensure a seamless experience for visitors. To gauge the effectiveness of bicycle and pedestrian facilities, collecting data on the following performance measures can be helpful: change in number of nonmotorized users and change in number of bicycle rentals.

### ADDITIONAL RESOURCES

- 2018 NPS Active Transportation Guidebook [https://www.nps.gov/subjects/transportation/upload/UPDATED\\_NPS\\_Guidebook\\_July2018\\_Final\\_UpdateSept2018-High-Res\\_WEB-2.pdf](https://www.nps.gov/subjects/transportation/upload/UPDATED_NPS_Guidebook_July2018_Final_UpdateSept2018-High-Res_WEB-2.pdf)
- 2012 Grand Teton Bicycling [http://www.nps.gov/grte/planyourvisit/upload/Bike\\_12.pdf](http://www.nps.gov/grte/planyourvisit/upload/Bike_12.pdf)
- 2012 Valley Forge National Historical Park Trails <https://www.nps.gov/vafo/planyourvisit/trails.htm>
- 2012 Exploring Bicycling Options for Federal Lands: Bicycle Sharing, Rentals and Employee Fleets <http://www.pedbikeinfo.org/cms/downloads/ExploringBicycleOptionsForFederalLands.pdf>
- 2011 Good Practices to Encourage Bicycling & Pedestrians on Federal Lands [https://westerntransportationinstitute.org/wp-content/uploads/2018/01/4w1303-BikePedPlan\\_ES.pdf](https://westerntransportationinstitute.org/wp-content/uploads/2018/01/4w1303-BikePedPlan_ES.pdf)
- 2013 PEDSAFE <http://pedbikesafe.org/PEDSAFE/>
- 2014 BIKESAFE <http://pedbikesafe.org/BIKESAFE/>



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# Bike Share and Bike Rental



Providing opportunities for visitors to ride bicycles can help decrease congestion by reducing the number of personal vehicles circulating on roadways, especially in parks with existing bike infrastructure. It can also provide visitors with a different way to experience the park by moving them out of traffic and directly into the resource. Parks may provide the temporary use of bikes through traditional bike rentals or bike share.

Bike rentals allow visitors to pick up bikes from a specific location and return them later to the same location, offering a selection of types and sizes of bikes. Bike rental facilities are often centrally located, such as near the entrance station, visitor center, lodging or stores within a park.

Bike share programs allow visitors to pick up and return bikes at various locations throughout the park, generally using only one type of bike. There are two platforms for bike sharing: docked and dockless. In docked bike share systems, bikes are picked up from and returned to a network of self-locking docks that release bikes upon receiving user payments from a kiosk or mobile app. Dockless bike share systems use self-locking bikes that can be parked in any appropriate place within a particular district, using a smaller footprint than docks. Users can locate and unlock a bike using a smartphone app. Parks should test reliability of the mobile apps in areas where cellular coverage is limited.

## CATEGORY: Bicycle/Pedestrian



### Factors That Could Increase Cost and Time

Implementation of this tool generally costs \$50,000 to \$100,000 and takes one to three years to complete.

The expense and duration of implementing bike share and bike rentals will depend on the park's proximity to existing bike share or rental operations. Urban parks with established operators may have very little expense to enable these on-site.

Factors that could increase cost and time:

- The size of the system and location of the docks or designated parking areas for dockless bikes requires planning and consideration.
- A docked bike share system can cost up to \$4,000 to \$5,000 per bike, including the cost of the docking stations (R. Beitsch, PEW Stateline, 2016). Many docked bike share systems in urban areas use corporate sponsorships to help cover costs.
- Dockless bike share is less expensive to implement since it does not require docking station infrastructure.
- Traditional bike rentals require a storage facility, purchase of the bikes, and staff to facilitate the bike rentals.
- May require introduction of a new concessions contract.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

Bicycle rentals and docked bike sharing may require a concessions contract. Bike sharing (dockless) could be done by a concessionaire, a gateway community, or a private company (which may require a Commercial Use Permit).

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- Bicycle Rulemaking Process (36 CFR 4.30)
- Concessions Contracts (36 CFR 51)
- NPS *Management Policies 2006*, Chapters 9 and 10
- DO 20: *Agreements*
- DO 32: *Cooperating Associations*

# Bike Share and Bike Rental

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
○	○	●	○	-	-	●	-	-

Parks should consider whether existing bicycle infrastructure can support an increase in bicycling within the unit. Cyclists should have safe areas designated for riding. This tool may be combined with increasing bicycle and pedestrian facilities (see *Bicycle/Pedestrian Facilities* tool.)

Bike rentals or sharing can address entrance station congestion when visitors enter the park on bikes instead of in their personal cars. Parking area congestion is improved the most when visitors enter the park on bike but can also benefit from having visitors use bikes rather than their cars to move around within the park.

### PROS

- Bike share and rental systems may allow visitors to park outside of the park and ride bikes into the park, thus reducing the number of cars inside the park.
- Providing park visitors with the option to rent a bike can reduce pollution and congestion by replacing cars on the road with bikes.
- Providing bike share or bike rentals allows people who do not own a bike or cannot bring a bike to the park with the opportunity to enjoy the park from a bike.

### CONS

- Bike share and rental systems may not mitigate congestion if visitors drive into the park before obtaining bikes.
- Docked bike share can be very expensive to implement.
- Dockless bike share is less cost prohibitive and more flexible but is relatively new to the United States. While the bikes are trackable by GPS, residents and local organizations often oppose them because they believe they clutter streets.
- Dockless bike share requires a reliable, strong Internet connection.

### COORDINATION / PARTNERSHIPS

A park should coordinate with local governments if they are interested in implementing a bike share outside the park. Local government ordinances and legislation could be in place about bike share.

### ADDITIONAL CONSIDERATIONS

- The success of bike rental or bike sharing depends on proper planning. Parks should make sure they have the infrastructure and policies in place to support safe bike access.
- The success of bicycle rental or sharing depends in part on how well they are marketed. Visitors need to know it is a safe and affordable alternative to driving into or within the park.
- The location of bike rental and bike share docks need to be convenient to visitors and close to visitor services.
- The types or styles of bicycles available should consider the facilities the park has open to riding and the types of riders that may want to use a bike while in the park.
- Bicycle trail wayfinding should be clear for visitors using rented or shared bikes.

# Bike Share and Bike Rental

## Implementation Considerations, cont.

### ADDITIONAL RESOURCES

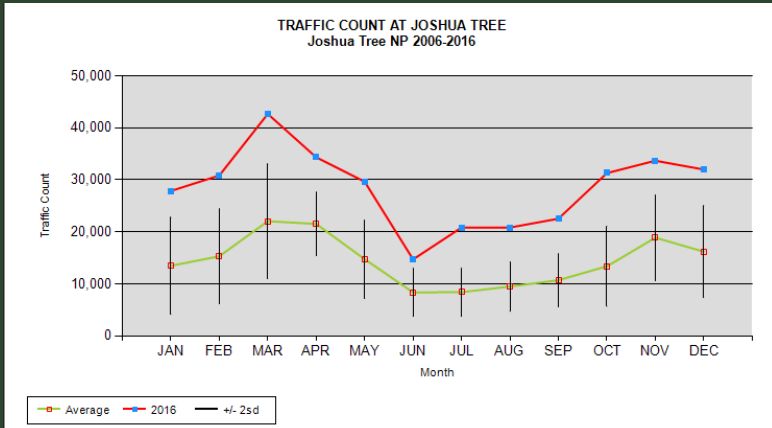
- 2016 “Despite Popularity, Bike Share Programs Often Need Subsidies” <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2016/03/24/despite-popularity-bike-share-programs-often-need-subsidies>
- 2015 National Mall and Memorial Parks Bicycling Information <https://www.nps.gov/nama/planyourvisit/bicyclinginformation.htm>
- 2018 National Park Service Active Transportation Guidebook [https://www.nps.gov/subjects/transportation/upload/UPDATED\\_NPS\\_Guidebook\\_July2018\\_Final\\_UpdateSept2018-High-Res\\_WEB-2.pdf](https://www.nps.gov/subjects/transportation/upload/UPDATED_NPS_Guidebook_July2018_Final_UpdateSept2018-High-Res_WEB-2.pdf)
- 2012 Exploring Bicycling Options for Federal Lands: Bicycle Sharing, Rentals and Employee Fleets <http://www.pedbikeinfo.org/cms/downloads/ExploringBicycleOptionsForFederalLands.pdf>
- 2020 What is Dockless Bike Share?” <https://altaplanning.com/dockless-bike-share/>
- 2019 Mississippi National River and Recreation Area (MNRRA) Bike Share Program <https://www.nps.gov/miss/planyourvisit/bike-share-program.htm>





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# Data Collection and Analysis



Quantitative data provides parks with factual evidence about existing conditions and impacts, which can lead to changes to traffic, transportation, or visitor use management by the park. Data can be used to

- Understand existing conditions, hotspots, and trends,
- Inform development of alternatives for transportation or visitor use management plans or visitation simulation models, and
- Monitor the effectiveness of post-project changes.

The first step is to identify the problems and issues the park wants to resolve, understand better, or monitor. The next step is to identify what the park can measure, where and for how long it will be measured, whether it will be repeated, and how the data will be analyzed.

Data can be collected manually or using automated equipment such as traffic detectors, webcams, automated vehicle locators, and automated passenger counters. Both static data (captured at one time and analyzed later) and real-time data (ongoing collection and use) may be useful. The park may also want to consider qualitative data if quantitative data is too expensive to collect.

Once the data is collected, it must be analyzed to translate the raw information into trends and benchmarks, which often requires technical support from outside the park.

## CATEGORY: Data Collection, Analysis, and Monitoring



### Factors That Could Increase Cost and Time

Each type of data collection generally costs \$50,000 to \$100,000 and takes less than one year to complete. Costs will also vary depending on the data collection is one-time, repeating and temporary, or permanent, and how many different types of data are needed.

Typical data collection methods to understand congestion conditions include:

- Portable, temporary traffic counters that count number and types of vehicles (such as RVs).
- Temporary automatic traffic recorders are usually inexpensive but limited to counting total vehicle numbers, not vehicle size, speed, or other details.
- Permanent counters with communications and a central server are more expensive than temporary counters.
- Manual counts (turning movements, parking occupancy, etc.) are typically expensive.
- Some data collection methods require electricity or wireless communications.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include staff time to manage data collection efforts (including downloading and analyzing data) and develop management responses to what the data yields as well as costs to repair and replace broken equipment (such as damaged road tubes) and update software for automated components. These long-term costs are only applicable to situations in which data collection is ongoing. Data collected to obtain a baseline may not need to be repeated, depending on the type of data needed.

### Implementation Considerations

The Introduction section outlines standard requirements for project implementation that generally apply to all tools in the Toolkit. The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- SO-3305 Ensuring Scientific Integrity within the Department of the Interior
- NPS *Management Policies 2006*, Chapters 2.3.1.4, 4.2.4, and 9
- DO 79: *Integrity of Scientific and Scholarly Activities*

# Data Collection and Analysis

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	●	●	●	●	●

### PROS

- Quantitative data provides more accurate information for decision making, as opposed to anecdotal or qualitative information.
- Collecting traffic data can also aid in the determination of indicators and thresholds for congestion and carrying capacity.

### COORDINATION / PARTNERSHIPS

Many state and local departments of transportation collect data on roads they own and operation. These data are often available at no cost. Parks should also coordinate with the regional Federal Lands Highway Division to see if they can provide assistance with data collection.

### CONS

- Data collected both manually and automatically can have inconsistencies and anomalies, which must be periodically validated.
- Surveys are a great way to collect visitors' perceptions; however, they require a long lead time (6 months to 1 year) and approval from the Office of Management and Budget.

### ADDITIONAL CONSIDERATIONS

- Parks can work with DSC, Natural Resource Stewardship and Science, Social Science Program, or their regional FLTP coordinator, etc. to develop data collection proposals.
- Data collection and analysis typically requires support from a contractor, DSC, the Volpe Center or other technical resources, as well as engagement from on-site staff.
- Related Tools: *Transportation Plan, Visitor Use Management Plan, Road Safety Audit.*
- Crowdsourcing is an emerging data collection method that uses data from third party companies that can track visitor use patterns via cell phone. It may be suitable as data for some types of traffic management issues.
- Portable traffic counters are sometimes available for use from FHWA.

### ADDITIONAL RESOURCES

- 2019 Denali National Park traffic monitoring <http://www.nps.gov/dena/naturescience/denali-park-road-capacity-study.htm>
- 2019 National Park Service Traffic Count Program (FOTSC, IRMA/PUSO) [https://irma.nps.gov/STATS/SSRSReports/National%20Reports/Query%20Builder%20for%20Traffic%20Counts%20\(1985%20-%20Last%20Calendar%20Year\)](https://irma.nps.gov/STATS/SSRSReports/National%20Reports/Query%20Builder%20for%20Traffic%20Counts%20(1985%20-%20Last%20Calendar%20Year))
- 2020 Portable counters can often be borrowed from the regional Federal Lands Highway Division offices, State or local Departments of Transportation <https://highways.dot.gov/federal-lands/about>
- 2017 Collaborative Visitor Transportation Survey has pre-approved transportation questions (Note: this survey is renewed every three years) [http://volpe-public-lands.s3-website-us-east-1.amazonaws.com/flma\\_lrtp\\_cvts/cvts.htm](http://volpe-public-lands.s3-website-us-east-1.amazonaws.com/flma_lrtp_cvts/cvts.htm)
- 2020 Visitor Use Management Guidebook <https://visitorusemanagement.nps.gov/VUM/Framework>
- 2020 Downeast Transportation, Island Explorer Satellites and Buses <http://www.exploreacadia.com/satellites.htm>

# Data Collection and Analysis

## Implementation Considerations, cont.

### ADDITIONAL RESOURCES

- 2019 Denali Park Road Capacity Study  
<http://www.nps.gov/dena/naturescience/denali-park-road-capacity-study.htm>
- 2016 Travel Monitoring and Traffic Volume: Traffic Monitoring Guide  
<http://www.fhwa.dot.gov/policyinformation/tmguide/>
- 2019 Yellowstone National Park Transportation & Vehicle Mobility Studies  
<https://www.nps.gov/yell/learn/management/transportation.htm>
- 2018 Guidance and Instructions for the Federal Land Management Agencies' Collaborative Visitor Transportation Survey Project (Version 3)  
[http://volpe-public-lands.s3-website-us-east-1.amazonaws.com/flma\\_lrtp\\_cvts/documents/CVTS%20Best%20Practices%20and%20Guidance%20V3-4-5-18.pdf](http://volpe-public-lands.s3-website-us-east-1.amazonaws.com/flma_lrtp_cvts/documents/CVTS%20Best%20Practices%20and%20Guidance%20V3-4-5-18.pdf)
- 2014 Guidebook on Pedestrian and Bicycle Volume Data Collection (NCHRP Report 797) [https://safetrec.berkeley.edu/sites/default/files/publications/guidebook\\_on\\_ped\\_and\\_bike\\_escholarship\\_uc\\_item\\_11q5p33w\\_2.pdf](https://safetrec.berkeley.edu/sites/default/files/publications/guidebook_on_ped_and_bike_escholarship_uc_item_11q5p33w_2.pdf)



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# Special Event Management



Park special events, such as unusual natural phenomena (wildflower blooms, etc.), annual celebrations, and historic anniversaries can drastically alter visitation and visitor use patterns and overwhelm park staff. A special event may last a few days, a few weeks, or an entire season. Special event management activities may include:

## Pre-event organization (three or more months in advance)

- checklist with deadlines and staff lead
- contracting and purchasing requirements
- coordination with partners
- permits
- training for staff, volunteers, and contractors

## Event coordination (one week or so prior to the event)

- delivery of traffic control support (ex. cones and Variable Messaging Signs)
- deployment of staff and traffic control measures
- deployment of volunteers and contractors

## Post-event debriefing and modifications for the next event (within 30 days of the event)

Special event activities should be started at least three months prior to the event; larger events require more lead time. A good special event plan could be reused and adapted to anticipated but not necessarily known events, like a holiday rush or newly emerging lava flow, as needed. For very large special events, use of the Incident Command System can be incorporated.

## CATEGORY: Data Collection, Analysis, and Monitoring



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs less than \$50,000 and takes less than a year to complete.

Factors that could increase cost and time:

- Training staff for new roles in the plan.
- A known event is more than a year away, such as a total eclipse or major national anniversary.
- Hiring a consultant to assist the park for larger events.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

Staff time is one of the largest costs associated with special event management. Parks may need to pull staff from existing responsibilities and pay overtime and potentially use staff from other parks to ensure the management plan is successfully coordinated and executed. Other operation and maintenance costs associated with special event management include periodically updating a special event management plan and replacing any equipment used to redirect traffic.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- 470 DM 2 - Digital Media Policy
- Policy Memorandum 11-02 - Social Media - Interim Policy
- NPS *Management Policies 2006*, Chapter 8.6
- DO 53: *Special Park Uses*

# Special Event Management

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	●	●	●	●	-

Special event management is most successful when the plans are well-coordinated in advance among law enforcement, visitor use assistance, facilities management, interpretive staff, and partners. This helps to manage expectations and promote communication during the event. Once a plan is in place, it can be used, assessed, and revised every year.

### PROS

- Test relatively low-cost checklist that can be done quickly.
- Improves visitor experience and safety.
- Identifies park operations support needs in advance.

### CONS

- Only addresses congestion at a specific time.
- Checklist must be done with enough lead time to coordinate and implement all recommended actions.

### COORDINATION / PARTNERSHIPS

Numerous parks use a special events approach. Talking with peers at other parks or asking for examples may reduce the level of effort for this tool. Parks should coordinate with neighboring communities and organizations when there is advanced notice about special events.

### ADDITIONAL CONSIDERATIONS

Many tools support special event management, including *Access Control*, *Dynamic/ Variable Message Signs*, *Manage Visitor Use Patterns*, *On-Site Visitor Congestion Information*, *Parking Management*, *Pre-Arrival Visitor Congestion Information*, *Ridesharing*, and *Transit/Shuttle Services*.

### ADDITIONAL RESOURCES

- 2020 Minute Man National Historical Park adapts to an influx of thousands of visitors to commemorate the opening of the American Revolutionary War on Patriots' Day <https://www.nps.gov/mima/index.htm>
- 2020 Golden Gate National Recreation Area implements special event management for the recurring Fleet Week event in San Francisco Bay <https://www.nps.gov/goga/index.htm>
- 2020 Devils Tower National Monument Sturgis Motorcycle Rally <https://www.nps.gov/deto/planyourvisit/sturgis-rally.htm>
- 2020 Event Planning Guide National Mall and Memorial Parks <https://www.nps.gov/nama/learn/management/event-planning-guide.htm>
- 2017 Grand Teton National Park Total Solar Eclipse <https://www.nps.gov/grte/planyourvisit/2017-solar-eclipse.htm>
- 2020 FHWA booklet "Traffic Management for Planned Special Events" [https://ops.fhwa.dot.gov/eto\\_tim\\_pse/about/pse.htm#:~:text=Advanced%20planning%20and%20coordination%20to,the%20day%20of%20the%20event.](https://ops.fhwa.dot.gov/eto_tim_pse/about/pse.htm#:~:text=Advanced%20planning%20and%20coordination%20to,the%20day%20of%20the%20event.)

# Entrance Lanes/Stations/Booth



When operational changes at the entrance stations do not reduce congestion to an acceptable level, adding entrance lanes/stations/booths may be necessary. Adding lanes, stations and/or booths can help reduce congestion because additional capacity allows for more throughput, which decreases congestion and delay time at the entrance station.

In conjunction with adding capacity at entrance stations, other operational efficiencies can be considered, including:

- Locating booths in tandem so two cars can be assisted at once within a single lane,
- Adding separate limited access only lanes for a portion of the traffic, such as pass holders, employees, concessionaires, and transit (see *Limited Access Only Lanes at Entrances* tool),
- Adding an automated gate (see *Automated Gate Restriction tool*), automated fee machines, or
- Allowing visitors to pay entrance fees before arriving to the park (see *Prepayment of Fees* tool).

Improvements made to the entrance station can also help with congestion downstream as well, such as improving congestion on adjacent roads. In some cases, redesigning or relocating an existing entrance may help reduce congestion and provide for a better visitor experience; however, this approach comes with a higher cost and longer implementation timeframe.

## CATEGORY: Entrance Station



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs \$50,000 to \$100,000 and takes one to three years to complete.

Factors that could increase cost and time:

- Amount of new roadway needed to support new lane or modifications of existing lanes.
- The need for a booth, gate, utilities or technology infrastructure.
- Entrance station expansion occurring in an undisturbed area.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include staff for the additional booth(s), utilities, and routine maintenance (upkeep on the entrance booth, repaving and restriping the entrance lane, and plowing/sanding the additional lane, etc.). See the *Automated Gate Restriction* tool.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- NPS *Management Policies 2006*, Chapter 9
- DO 87A: *Park Roads and Parkways*



# Entrance Lanes/Stations/Booth

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
-	●	○	-	-	-	●	-	●

This tool may help alleviate roadway congestion at entrance stations by increasing the vehicle throughput. However, if a park is also experiencing internal roadway or parking congestion, moving visitors more quickly through the entrance station may result in greater “downstream” congestion. The park may want to consult their regional FLTP Coordinator to evaluate potential tradeoffs. Also, the park should confirm that the National Park Service owns and operates the roadway on which the entrance station is located (if it is owned by a non-NPS entity, additional coordination will be required).

### PROS

- Can allow for increased visitor throughput.
- Can allow for geometric reconfigurations to improve efficiency.
- Can further improve efficiency with limited access only lanes or automated gate restriction for pass holders, employees, concessionaires, and/or transit (see *Limited Access Only Lanes at Entrance Stations* and *Automated Gate Restrictions* tools).
- Staffing of the additional booth(s) may only be necessary during times of congestion.
- Automated pay stations can reduce staffing needs.

### CONS

- Can increase road congestion and parking demand downstream in the park.
- Additional staffing will be needed for additional booths.
- Tandem booths would not increase capacity as much as an additional lane because a vehicle at the first booth would sometimes block the second booth.

### COORDINATION / PARTNERSHIPS

The park may need to coordinate with their gateway community or local jurisdiction that owns or operates the roadway near where the new or modified entry lane(s) will be added. Engaging partners in this potential project may help to assess potential tradeoffs early in the project so the design can reduce impacts to partners, non-NPS roads, resources and visitors.

### ADDITIONAL CONSIDERATIONS

To gauge the effectiveness of a change to entrance lanes/stations/booths, collecting baseline and post-project data in following areas can be helpful:

- Transaction time
- Vehicle queue length
- Vehicle wait time

### ADDITIONAL RESOURCES

- 2011 Grand Canyon National Park Visitor Access and Transportation Guide <https://rosap.nsl.bts.gov/view/dot/9551>
- 2018 Pinnacles National Park Entrance Station Relocation Environmental Assessment <https://www.nps.gov/pinn/learn/news/entrance-station-relocation.htm>
- 2018 “Zion proposes overhaul of main entrance station to keep up with growing crowds” <https://www.thespectrum.com/story/news/2018/08/20/facelift-proposed-zion-national-parks-main-entrance/1042003002/>
- 2020 Death Valley National Park Payment Locations – Fee Machines <https://www.nps.gov/deva/planyourvisit/fees-and-passes.htm>

# Limited Access Only Lanes at Entrances



A limited access only lane is designated for use by certain vehicle or shuttle traffic. In a park, a limited access lane is typically available to those that do not need to pay the entrance fees or ask questions, such as employees, concessionaires, delivery trucks, emergency responders, and transit vehicles. By removing this portion of vehicle traffic from the normal flow, visitors will have decreased delay, shorter queues, and an improved visitor experience. This lane can also be used by pass holders if used in conjunction with an automated gate (see *Automated Gate Restriction* tool) or visitors who prepay the entrance fees (see *Prepayment of Fees* tool).

This tool provides benefits to those using the limited access lane by increasing efficiency, decreasing delay, and increasing their ability to stay on schedule. This tool is similar to the *Entrance Lanes/Stations/Booths* tool except that it is only for a particular portion of the vehicle traffic.

Above: Employee and visitor lane separation, Yellowstone National Park.  
Photo credit: Amalia Holub, US DOT Volpe Center

## CATEGORY: Entrance Station



### Factors That Could Increase Cost and Time

Implementation of this tool generally costs \$50,000 to \$100,000 and takes one to three years to complete.

Factors that could increase cost and time:

- Expansion is needed to create the limited access lane, especially if the adjacent land is undisturbed.
- Addition of booth, gate, or technology infrastructure is needed.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include the cost to staff the additional booth (if necessary), utilities such as electricity, and maintenance such as upkeep on the entrance booth; repaving and restriping the entrance lane; and plowing/sanding the additional lane. The operation and maintenance costs associated with an automated gate are provided in the *Automated Gate Restriction* tool.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- NPS *Management Policies 2006*, Chapters 8 and 9
- DO 22: *Recreation Fees*

# Limited Access Only Lanes at Entrances

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
-	●	○	-	-	-	●	-	○

This tool may be used to help alleviate roadway congestion at entrance stations by allowing some vehicles to proceed more quickly through the entrance station. However, if a park is experiencing roadway congestion within the park, creating fast pass lane for visitors with passes may exacerbate internal roadway congestion by increasing the pace of vehicle volume entering the park.

It may be necessary to coordinate implementation of a limited access only lane with the regional FLTP Coordinator, such as when capital funding is needed for roadway expansion.

### PROS

- Can increase throughput and decrease delay/queueing.
- Can significantly improve the reliability of transit services entering the park, which improves the visitor experience of the transit riders.

### CONS

- Repurposing an existing entrance lane as a limited access lane can reduce the overall entrance station capacity; therefore increasing congestion. For a park experiencing heavy entrance station congestion, a limited access lane should only be considered when adding another lane (see Entrance Lanes/Stations/Booths tool).
- If geometric constraints exist at the entrance, those using the limited access only lanes may still get caught in visitor congestion.
- Funding may be challenging if the location is not within the NPS boundary.

### COORDINATION / PARTNERSHIPS

The park may need to coordinate or partner with the gateway community or local jurisdiction that owns and operates the roadway along where the limited access lane(s) will be added. This is particularly true if modifications will impact traffic or additional improvements, such as expansion of an entrance drive apron along a non-NPS roadway, are needed.

### ADDITIONAL CONSIDERATIONS

While redistributing traffic with a limited access lane will have positive impacts, a greater impact may be seen by adding additional entrances for visitors (see Entrance Lanes/Stations/Booths tool).

To gauge the effectiveness of a limited access only lane, collecting data on the following performance measures can be helpful: change in average flow time, and change in queue length.

### ADDITIONAL RESOURCES

- 2012 Beaver Meadows entrance station at Rocky Mountain National Park has automated entry for annual pass holders, employees, and vendors [https://www.nps.gov/romo/bm\\_entrance\\_station.htm](https://www.nps.gov/romo/bm_entrance_station.htm)
- 2020 Bryce Canyon National Park has an automated lane for employees, vendors, and transit vehicles <https://www.nps.gov/brca/planyourvisit/directions.htm>
- 2018 “Rocky Mountain National Park adding fast-lane to Estes Park’s Fall River entrance” <https://theknow.denverpost.com/2018/09/14/rocky-mountain-national-park-fall-river-entrance-improvements/195313/>
- 2011 Grand Canyon National Park Visitor Access and Transportation Guide <https://rosap.ntl.bts.gov/view/dot/9551>

# No-Car Access Options



Encouraging visitors to leave their personal cars outside of the park is among the most effective ways of reducing traffic congestion within the park. No-car access to the park can be in the form of transit, ridesharing, and bicycle and pedestrian paths. These multimodal options must be accompanied by car-free travel options within the park to enable visitors to circulate inside the park boundaries (see *Bicycle/Pedestrian Facilities*, *Transit/Shuttle Services*, and *Ridesharing* tools).

No-car access options are only successful in reducing congestion when visitors know about and use these systems. A marketing campaign improves awareness through coordinated press releases, social media promotions, information on websites (see *Pre-Arrival Visitor Congestion Information* tool), printed materials, transit vehicle graphics, and dynamic/variable message signs (see *Dynamic/Variable Message Signs* tool). The timing of the messaging, either before visitors arrive or once they are on-site, will depend on the no-car access options the park wants to provide.

Another way to encourage non-vehicle modes of transportation is through the use of incentives. Incentives can include providing park interpretation on transit, adding bicycle racks across the park and on transit vehicles, and establishing preferred parking for ridesharing participants.

## CATEGORY: Entrance Station



### Factors That Could Increase Cost and Time

Implementation of this tool generally costs less than \$50,000 and takes less than one year to complete.

Factors that could increase cost and time:

- Extensive marketing of alternative mode options, especially if done through a private firm.
- Extent to which infrastructure such as wayfinding signs and bicycle racks are installed.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include staff time to continually keep promotional materials updated and distributed, as well as upkeep of signage, bicycle racks and related supporting infrastructure.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- Rulemaking Process
- NPS *Management Policies 2006*, Chapters 8, 9, and 10
- DO 20: *Agreements*
- DO 32: *Cooperating Associations*
- DO 77A: *Civic Engagement and Public Involvement*

# No-Car Access Options

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	○	-	○	-	●	-	●

Promoting no-car access options may increase demand on the alternative modes being targeted. The park should monitor capacity on each mode to ensure it is able to handle the increased use.

### PROS

- Increased no-car access reduces the total number of vehicles entering the park.
- Improves the effectiveness of multimodal investments the park has already made (transit and bicycle/pedestrian facilities).
- Builds upon existing communication platforms with limited additional effort.
- Encourages visitation by people who do not drive or do not own a car.

### CONS

- Promoting no-car access to the park requires the park to ensure there are adequate car-free circulation options available inside the park, which can be expensive.
- Promoting transit services can potentially increase the number of users beyond the capacity of the current system.

### COORDINATION / PARTNERSHIPS

Parks should coordinate with local municipalities to improve access via shuttles, bicycling, and walking. Coordination will be necessary with the local transit agency, local media, local ridesharing companies, and gateway communities. Parks in urbanized areas may want to include bike sharing companies in discussions about promoting access and bike infrastructure.

### ADDITIONAL CONSIDERATIONS

Before promoting no-car access options, the park should have a good understanding of what multimodal options are available to their visitors. Asking for periodic feedback on the effectiveness of the marketing campaign either from partners or visitor surveys may be useful to help adjust information based on evolving visitor needs.

### ADDITIONAL RESOURCES

- 2020 Sandy Hook Unit of Gateway National Recreation Area parking fee <https://www.nps.gov/gate/planyourvisit/beach-parking-at-gateway.htm>
- 2020 Gateway National Recreation Area – Directions to Jamaica Bay: Public Transportation <https://www.nps.gov/gate/planyourvisit/jamaicabaydirections.htm>

# Prepayment of Fees

## Digital Pass Selection

GRAND CANYON NATIONAL PARK

Enter the number of passes you would like to purchase from the available choices below:

PASS TYPE	DURATION	PRICE	QUANTITY
Private Vehicle Pass	7 days	\$35	0
Motorcycle Pass	7 days	\$30	0
Individual Pass	7 days	\$20	0

Need to Know



Site-Specific Digital Pass  
Grand Canyon National Park

No passes have been selected. Please choose how many passes you will need for this trip.

Add to Cart

Frequently Asked Questions

Prepayment of entrance, parking, transit, and activity (i.e., tours) fees allow visitors to pay prior to entering the park. Prepayment of fees can reduce or eliminate the transaction time at the entrance station or while boarding transit, potentially reducing congestion and queue lengths. There is also a potential to have visitors who have prepaid entrance fees to enter through a limited access only lane at entrances (see *Limited Access Lanes at Entrances* tool).

There are multiple approaches available for prepayment of fees. These include online through park mobile websites; working with staff at businesses and visitor centers in the gateway community; at an automated fee machine (kiosk for self-paying fees) in the gateway community and parks (although increasing use of mobile phones and internet connectivity will eventually eliminate kiosks); or at a designated transit stop.

## CATEGORY: Entrance Station



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs \$50,000 to \$100,000 and takes one to three years to complete.

Factors that could increase cost and time:

- Establishing website for payment if the park does not use existing online options, such as recreation.gov.
- Some online payment systems that include automated management charge a fee for each transaction (e.g., recreation.gov), whereas other online options do not charge the park a fee but must be managed locally by park staff (e.g., pay.gov).
- Equipment at park entrances to scan digital or printed receipts/proof of payment.
- Whether transit partners can share the cost of implementing fare collection systems.
- Procurement and delivery time for equipment such as automated fee machines.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include maintenance such as software updates and equipment maintenance and upgrades. These can be contracted out to allow park staff to focus on park operations. Automated payment systems can also provide important visitation information, such as percentage of visitors paying in advance and time efficiency at the entrance gate, that should be analyzed year to year to understand visitor patterns over time.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool. Parks interested in adopting prepayment of fees or revising their fee structure should contact the Recreation Fee Program.

Specific pre-implementation issues for use of this tool include:

- NPS *Management Policies 2006*, Chapter 8
- DO 22: *Recreation Fees*
- DO 77A: *Civic Engagement and Public Involvement*

# Prepayment of Fees

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
-	●	-	○	-	-	●	-	-

### PROS

- Prepayment of fees can reduce congestion at entrance stations by reducing transaction times.

### CONS

- Visitors may lose their first contact with a park staff member for interpretation or questions.
- Congestion within the park may increase if the entrance station processes visitors faster.
- Prepaid visitors may still have to wait in entrance station lines if there is not a separate entrance lane. While overall wait times are lower, visitors may be frustrated.
- Automated fee machines will require regular maintenance.
- Lack of cell phone service may create issues with mobile passes/tickets.
- Marketing is needed to alert visitors to this service.

### COORDINATION / PARTNERSHIPS

Implementation of this tool requires coordination with NPS Recreation Fee Program staff and may require coordination with visitor centers, hotels, and stores in the gateway communities where prepayment may be accepted (manually or through an automated fee machine), transit operators if the transit fee is to be prepaid, and the park facility management team if the payment kiosks will be installed in the park.

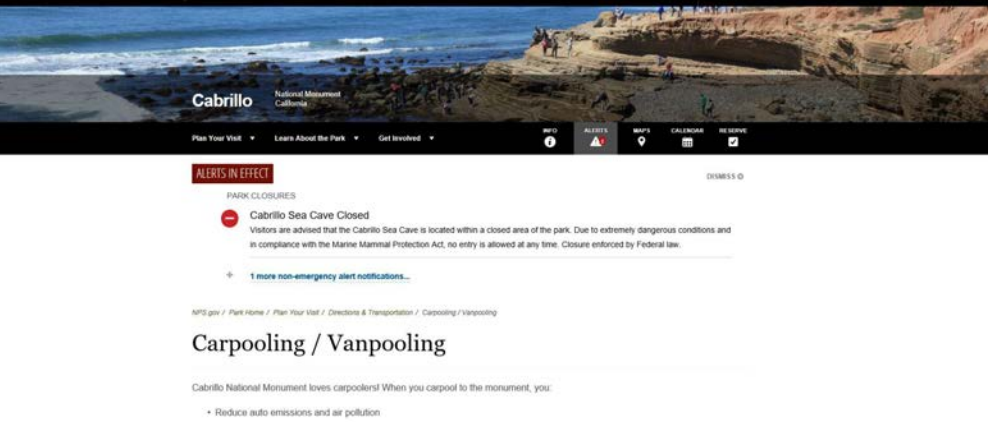
### ADDITIONAL CONSIDERATIONS

- When considering an automated fee machine, evaluate sun glare, lighting, drive-up versus walk-up, shelter from weather, response time for repairs, potential for vandalism, and the long-term viability of the technology vs. other options (like pre-paid fees).
- Use of web/mobile-based applications should consider wireless/cellular connectivity coverage near the park, and where, when, and how to notify visitors.
- Partnership agreements will need to be completed with the transit agency and for any installations of fare card purchasing machines located in areas outside the park.

### ADDITIONAL RESOURCES

- 2020 The Recreation Fee Program website <https://www.blm.gov/programs/recreation/recreation-fee-program>
- 2020 Rocky Mountain National Park Fees and Passes – Buy Your Pass Online <https://www.nps.gov/romo/planyourvisit/fees.htm> and <https://pay.gov/public/search/global?formSearchCategory=National+Park+Service>
- 2020 Your Pass Now <https://yourpassnow.com>
- 2020 Gateway Arch National Park Fees and Passes <https://www.nps.gov/jeff/planyourvisit/fees.htm>
- 2020 Grand Canyon National Park Fees and Passes <https://www.nps.gov/grca/planyourvisit/fees.htm>

# Ridesharing Services

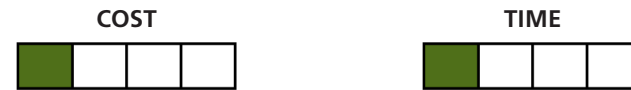


Ridesharing services, carpooling, or vanpooling, can increase the number of people per vehicle and decrease congestion by reducing the number of personal vehicles on roadways, at entrance stations, and in parking areas.

Ridesharing services, such as Uber or Lyft, use mobile applications that allow riders to find a ride from their current location to their destination. Ridesharing reduces demand for parking and the congestion generated by vehicles searching for parking spaces. However, it is only helpful in reducing roadway congestion when the vehicles carry more passengers than when visitors arrive in their own vehicle. Otherwise, the number of vehicles on park roads remains the same or worsens. Successful ridesharing requires that visitors can reliably access private ridesharing apps.

Carpools/vanpools are typically organized informally through social media or specific carpool/vanpool websites and can originate from either a personal residence or a centralized meeting place. Vanpools often use 13-15 seat passenger vans that are purchased, leased, or rented specifically for vanpooling. Carpools and vanpools could have dedicated parking spaces that do not require them to compete with personal vehicles.

## CATEGORY: Limited Use Tool



## Factors That Could Increase Cost and Time

Implementation of this tool costs up to \$50,000 and takes less than one year to implement.

Costs can vary significantly depending on the type of ridesharing service that will be accommodated. If ridesharing becomes a frequent tool for visitors, parks may want to consider rideshare loading/unloading zones at popular destinations.

Factors that could increase cost and time:

- Fast pass entrance lanes.
- Designating or constructing drop-off/pick-up areas.
- Constructing communication infrastructure to support cellular service and/or Wi-Fi for scheduling a ride or checking the status of a ride.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term costs for all ridesharing services include maintaining up-to-date promotional materials and potentially staff time to coordinate with ridesharing companies.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- 470 DM 2 - Digital Media Policy
- Policy Memorandum 11-02 - Social Media - Interim Policy
- DO 20: *Agreements*
- DO 32: *Cooperating Associations*
- DO 77A: *Civic Engagement and Public Involvement*



# Ridesharing Services

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	○	○	-	-	-	●	-	-

Promoting ridesharing may improve parking area congestion; however, it may contribute to roadway congestion if there is a substantial increase in the number of rideshare vehicles circulating within the park. The success of ridesharing is dependent on cell phone coverage, and visitors need to be able to hail a ridesharing vehicle when leaving the park.

### PROS

- Decreases parking area congestion when rideshare services drop off riders but do not need to park.
- Provides access options for nondrivers and those who do not own a car.
- Can help visitors close the gap between local transit routes and park destinations.

### CONS

- Reduces visitor flexibility in the ability to access sites on their own schedule.
- Lack of cellular access inside the park could strand visitors needing mobile app access.

### COORDINATION / PARTNERSHIPS

Coordination will be needed with private companies providing these services and with local agencies that provide ridematching services, such as transportation management associations, transit agencies, and community transportation organizations. Parks could partner with ridesharing companies to encourage or incentivize park visitors to choose rideshare over personal vehicles.

### ADDITIONAL CONSIDERATIONS

Ridesharing is more common in urban than rural areas due to different user needs, availability of drivers, and access to cellular/Wi-Fi networks for mobile apps. To gauge the effectiveness of ridesharing services, collecting data on the following performance measures can be helpful: vehicle occupancy rates and number of employees ridesharing.

### ADDITIONAL RESOURCES

- 2018 Cabrillo National Monument Directions & Transportation: Ride Sharing (Uber, Lyft...) <https://www.nps.gov/cabr/planyourvisit/ride-sharing.htm>
- 2019 Muir Woods National Monument Directions & Transportation <https://www.nps.gov/muwo/planyourvisit/directions.htm>
- 2018 “Ridesharing, Carpooling and Vanpooling” <http://www.vtpe.org/tm/tm34.htm>
- 2010 Synthesis Report 98: Ridesharing as a Complement to Transit <http://www.trb.org/Main/Blurbs/166923.aspx>
- 2020 “Transportation Network Company (TNC) legislation” <https://policy.tti.tamu.edu/technology/tnc-legislation/>

# Access Control



Access control is a technique that can be used to modify visitor use patterns (either temporarily or permanently) and access to and along roadways, trailheads, and parking areas. This tool focuses on physical infrastructure to control the number of vehicles accessing the given asset at certain times, such as automated gates (see *Automated Gate Restriction* tool) and altering entrance/exit patterns. The benefits of access control include improved movement of traffic, reduced crashes, and fewer vehicle conflicts. Access control can also benefit pedestrians and bicyclists by reducing the number of conflicts along their route (e.g., the number of driveways).

Where there are multiple entrances and exits to large parking areas or visitor centers, vehicular congestion can occur. Access control simplifies circulation by closing or moving some access points (i.e., curb cuts) or making them one-way to reduce circling traffic that contributes to congestion.

## CATEGORY: Operations/Access Management



## Factors That Could Increase Cost and Time

The total capital cost for this tool is generally low and the implementation timeframe is usually less than one year. Capital costs will vary depending upon the exact measures used.

Factors that could increase cost and time:

- A high number of access points that need to be modified.
- Signage to help visitors navigate the new access patterns.
- Installing traffic control devices (see *Automated Gate Restriction* and *Intersection Improvements* tools).
- Adding new pull-outs (see *Roadway Pull-Outs* tool).
- Adding new turning lanes (see *Acceleration/Deceleration Lanes* tool).

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool may include yearly repair and replacement of materials, repaving and restriping, snow removal/sanding, and staff time for temporary circulation changes.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- Rulemaking Process
- *NPS Management Policies 2006*, Chapter 8

# Access Control

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	-	●	○	●	●	●

Piloting access restrictions allows park staff to observe how the changes impact both the targeted location, as well as others in the unit. Changes to access restrictions must be coordinated with updated emergency access plans to ensure emergency vehicles maintain access to all areas of the park.

### PROS

- Reducing traffic “conflict points” increases traffic flow, improves safety, and reduces delay.
- Using boulders or other natural materials to close a parking area entrance/exit or other access point or paint and signage to change the direction of an entrance/exit is an expensive and quick way to block access.
- Reducing access points in large parking areas can improve flow and encourage visitors to find remote parking spaces.
- Reduced vehicle access points can be beneficial to pedestrians and bicyclists.

### COORDINATION / PARTNERSHIPS

Depending upon access control solutions to be implemented, coordination may be necessary with gateway communities, the local and/or state departments of transportation, and/or the regional Federal Lands Highway Division.

### CONS

- Reducing the number of access points to a parking area, visitor center, etc., may increase congestion at other access points.
- Access control may require a comprehensive review of all access points within a park and may require additional infrastructure such as turning lanes (see *Roadway Geometry Improvements* tool), pull-outs (see *Roadway Pull-Outs* tool), and improved traffic control devices (see *Automated Gate Restriction* and *Intersection Improvements* tools).

### ADDITIONAL CONSIDERATIONS

Implementing this tool may require modifying traffic circulation patterns (see *Traffic Circulation Changes* tool). For example, reducing entrance/exit points to a parking area may require that parking area traffic pattern be changed to one-way.

To gauge the effectiveness of implementing access control, collecting data on the following performance measure(s) may be helpful: changes in congestion (delays) in and around access points (parking areas, visitor centers, etc.) where access control has been implemented.

### ADDITIONAL RESOURCES

- 2020 Jacob Riis Beach in Gateway National Recreation Area has several entrances. Secondary entrances have been closed. This change was implemented partly for safety reasons and partly for revenue control. <https://www.nps.gov/gate/learn/historyculture/jacob-riis-park.htm>
- 2020 Zion National Park has restrictions on personal vehicle access <https://www.nps.gov/zion/frequently-asked-questions-about-zion-canyon.htm>
- 2020 Federal Highway Administration (FHWA) access management publications and resources [https://ops.fhwa.dot.gov/access\\_mgmt/](https://ops.fhwa.dot.gov/access_mgmt/)

# Automated Gate Restriction



Automated gates can be installed at entrance stations to allow pass holders, employees, transit, concessionaires, or others who enter regularly, to more quickly pass through entrance points and bypass the congested entrance lines.

Automated gates are often used at entrances in conjunction with the *Limited Access Only Lanes* tool and potentially automated fee collection, which are similar to how “EZ Pass” works on toll roads. Automated gates may be used at entrance stations or at parking lot entrances. Several gate access methods exist, including a credit card key, remote control, radio frequency identification transponders, smart-card technology, and automatic vehicle identification.

The simplest use of this tool would be for an “employee only” system. If allowed for visitors, it could be combined with the *Prepayment of Fees* or *Visitor Reservation Systems* tools.

## CATEGORY: Operations/Access Management



## Factors That Could Increase Cost and Time

Capital costs for an automated gate system are generally in the medium range and the implementation time is near term. Procurement and installation will vary depending upon the method chosen for the system and if more than one automated gate system will be installed.

Factors that could increase cost and time:

- If more than one automated gate system will be installed.
- Adding a new lane for the gate instead of repurposing an existing lane (see *Entrance Lanes/Stations/Booths* tool).
- Other infrastructure needs (changes to roadway geometry, etc.).

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include issuance and replacement of the access devices (e.g., transponders or key cards), a monthly electricity charge, and potential repair and replacement parts.

## Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- *NPS Management Policies 2006*, Chapter 8

# Automated Gate Restriction

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
○	●	●	-	-	-	●	-	-

### PROS

- Manages vehicle flow in and out of the park or congested area. Time of day or even season of use can vary.
- When used with a limited access only lane (see *Limited Access Only Lanes* tool), pass holders, employees, transit, and/or concessionaires can be removed from the traffic stream.
- May be able to collect accurate and automated usage data.

### CONS

- If there are only a limited number of users for an entrance station automated gate, there may be minimal impact to reducing entrance station congestion.
- Repurposing an existing entrance lane with an automated gate restriction rather than installing a new entrance lane could have a negative impact on entrance station congestion, since overall entrance station capacity is reduced.

### COORDINATION / PARTNERSHIPS

This tool would require internal coordination to provide employees and concessionaires with the necessary equipment to use the automated gate. If this service were being provided to visitors, coordination would be necessary with communications staff for advertising this service as well as those responsible for prepayment of entrance fees (see *Prepayment of Fees* tool).

### ADDITIONAL CONSIDERATIONS

The park will need to quickly address repairs if the gate fails to operate. To gauge the effectiveness of an automated gate, collecting data on the following performance measures can be helpful: change in processing time, queue length, and/or vehicle wait time.

### ADDITIONAL RESOURCES

- 2020 Little River Canyon National Preserve Canyon Mouth Picnic Area automated gates <http://www.nps.gov/liri/>
- 2020 Bryce Canyon National Park has an automated gate at their entrance station for employees and transit vehicles <https://www.nps.gov/brca/index.htm>
- 2019 The US Forest Service installed automated gates on the eastbound off-ramp from Interstate 70 to prohibit parking and provide shuttle-only access to Hanging Lake parking <https://www.fs.usda.gov/recarea/whiteriver/recarea/?recid=41225>

# Manage Visitor Timing and Distributions

## Don't Let Gridlock Spoil Your Acadia Experience

Acadia National Park is among the top ten most popular national parks in the United States, welcoming more than 3.5 million people a year. Visitation has surged almost 60 percent in a decade, leading to severe crowding at most park attractions. Between June 28 and Sept 4, 2017, the road to the Cadillac Mountain summit closed 49 times – for as little as 13 minutes, or as long as 90 minutes – due to gridlock congestion and public safety concerns.



Crowds of visitors stand shoulder-to-shoulder within railings at Thunder Hole

Crowds of visitors stand shoulder-to-shoulder within railings at Thunder Hole in August 2018.

Photo courtesy of Hiral Pandya. Used with permission.

Managing visitor timing and distribution refers to actions that parks can take to monitor, control, and adapt the timing of use (across the day and season) and distributions of use (where visitors go within a park). Visitor arrival patterns are complex and have wide-ranging impacts on gateway communities, surrounding public lands, and potentially other national and regional stakeholders. The distribution of visitors within the park impacts congestion levels at sites within the park. By managing visitor timing and distributions, parks can encourage visitors to come to the park at off-peak times, visit less congested locations, and schedule tours during off-peak hours. Communication is a vital part of this tool because parks need to inform their visitors of the ways they would like them to use the park.

The approach to managing visitor timing and distribution can range from passive strategies (communications and marketing on less congested times and sites to visit) to more active strategies (e.g., limiting access by private vehicles, closing areas, reservations). Parks may start by piloting passive strategies and monitoring the impacts before deciding to move to more active strategies.

CATEGORY: Operations/Access Management



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs under \$50,000 and takes less than one year to complete.

The expense and duration of managing visitor timing and distributions will depend on whether the park focuses on communication efforts or capital changes.

Factors that could increase cost and time:

- Implementation of new services.
- Developing a full visitor use management plan.
- Changes visitor use patterns.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include updating websites and other methods of communication used to inform visitors.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- 470 DM 2 - Digital Media Policy
- Policy Memorandum 11-02 - Social Media - Interim Policy
- NPS *Management Policies 2006*, Chapter 8
- DO 22: *Recreation Fees*
- DO 77A: *Civic Engagement and Public Involvement*

# Manage Visitor Timing and Distributions

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	●	-	●	●	-

### PROS

- Improved visitor experience.
- Better aligned visitor expectations and visit satisfaction.
- Better resource protection.
- Less congestion at popular sites and on popular roads.

### CONS

- Passive strategies rely on visitor willingness to change behavior.
- Observable changes in visitation patterns can take a while to accumulate.

### COORDINATION / PARTNERSHIPS

Parks should coordinate with stakeholders, including gateway communities, to understand potential negative impacts of visitor use patterns. For instance, asking visitors to arrive at the park before local businesses open in the gateway community reduces their customer base.

### ADDITIONAL CONSIDERATIONS

Parks may want to create a visitor use management plan to better understand their visitor use patterns and the congestion management tools that can be applied to different situations. See the *Visitor Use Management Planning* tool for more information. Other tools that influence visitor use patterns include *Enforcement/Traffic Management, Transit/Shuttle Systems, and Visitor Reservation Systems*.

### ADDITIONAL RESOURCES

- 2020 Yosemite instructs visitors to Yosemite Valley to expect congestion and arrive before 9:00 a.m. <https://www.nps.gov/yose>
- 2020 Arches National Park provides information on their website about expected travel times and days/times to avoid <https://www.nps.gov/arch>
- 2020 NPS description of visitor use management, including a discussion of managing visitor use patterns <https://visitorusemanagement.nps.gov/VUM/WhatIsIt>
- 2020 Yellowstone National Park Visitor Use Management [https://www.nps.gov/yell/learn/management/visitor-use-management.htm#:~:text=Yellowstone%20has%20not%20begun%20a,4\)%20gateway%20communities%20and%20partners.](https://www.nps.gov/yell/learn/management/visitor-use-management.htm#:~:text=Yellowstone%20has%20not%20begun%20a,4)%20gateway%20communities%20and%20partners.)

# Traffic Restrictions/Enforcement



Traffic restrictions improve road network efficiency. They are most effective in areas where congestion occurs regularly. Restrictions can change daily, on weekends, or seasonally depending on park operational needs, and can be temporary or permanent. Techniques include:

- Prohibiting turning movements at certain times of day,
- Prohibiting roadside parking (placing boulders or other permanent materials),
- Temporary closures for crowded destinations,
- Setting posted limitations on parking duration,
- Changing signs and markings,
- Using flexible delineators, and
- Directing traffic, ticketing, and enforcement.

These activities can be carried out by park staff or a contractor, and done ad hoc or as part of a season plan (see *Special Event Management* tool). Pilots for traffic restrictions are encouraged because they are small-scale, time-limited, reversible, and designed to explore potential benefits and impacts to visitors, resources, and partners. They are also a great first step to longer-term solutions.

**CATEGORY:** Operations/Access Management



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs up to \$50,000 and takes less than one year to implement.

Factors that could increase cost and time:

- Implementation of signs, markings, and natural barriers are lower in cost than staff salaries.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include salaries of traffic management and enforcement personnel, which sometimes can be offset by fine collections.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- Rulemaking Process
- NPS *Management Policies 2006*, Chapter 8



# Traffic Restrictions/Enforcement

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	○	●	●	●	●	○

The most effective traffic restrictions are those that provide clear direction to visitors, are easy for visitors to comply with, and do not require on-site staff to direct traffic.

### PROS

- Reduced congestion and improved safety.
- Improved resource protection by enforcing policies limiting travel on roads in sensitive areas
- Prevents parking in protected areas.

### CONS

- Often requires increased staff (park or contracted) resources on-site.
- Preventing illegal parking will lead some drivers to circle parking areas looking for a space, adding congestion and pollution.
- Ticketing visitors for traffic violations is often uncomfortable for visitors and the park.

### COORDINATION / PARTNERSHIPS

A procedure may need to be implemented to monitor parking areas and to inform entrance station personnel of the status of parking areas so that they can notify visitors of where to look for parking.

### ADDITIONAL CONSIDERATIONS

Traffic restrictions policies and enforcement penalties should be clearly explained to visitors through signage, the park's website, signage (temporary, static and dynamic), and social media. New traffic restrictions can be piloted to test whether they have the desired impacts before becoming permanent.

Several other tools are part of traffic management: *Vehicle Size/Type Restrictions, Intersection Improvements, Traffic Circulation Changes, Traffic Calming, Managing Visitor Use Patterns.*

### ADDITIONAL RESOURCES

- 2020 Bryce Canyon National Park closes viewpoints due once the parking areas reach capacity. One viewpoint was closed for 59 days in a row at different times of the day due to a lack of parking. <https://www.nps.gov/brca/index.htm>
- 2019 Anacostia National Park enforces parking rules during baseball games <https://www.nps.gov/anac/planyourvisit/directions.htm>
- 2020 Pinnacles National Park uses boulders to block unauthorized parking along Bear Gulch Road <https://www.nps.gov/pinn/planyourvisit/directions.htm>
- 2020 Visitors driving in the bus lane in Yosemite Valley face a \$280 fine <https://www.nps.gov/yose/planyourvisit/traffic.htm>
- 2020 Visitors parking illegally in GLAC's Many Glacier Hotel spaces face a warning sticker and a fine <https://www.nps.gov/glac/planyourvisit/directions.htm>
- 2015 United States Park Police <https://www.nps.gov/subjects/uspp/traffic-safety-unit.htm>

# Vehicle Size/Type Restrictions



Prohibiting or restricting certain sizes or types of vehicles from specific areas in a park can help improve traffic flow, reduce congestion, enhance visitor experience, and protect resources. Restrictions can vary by time of day or season based on established visitor use patterns or respond to unusual conditions (such as a high visitation weekend or special event). Examples of vehicle size/type restrictions include:

- Restricting all personal vehicle traffic on a roadway and allowing only transit,
- Restricting vehicles based on width, length, weight or time of day, and
- Closing a parking area when all spaces are fully occupied.

Generally, vehicle size/type restrictions require public awareness and enforcement. Signage, dynamic/variable message signs, websites, GPS information, and media and social media (see *Dynamic/Variable Message Signs*, *Pre-Arrival Visitor Congestion Information*, *On-Site Visitor Congestion Information*, and *Tour Bus Management* tools) can be useful to communicate any restrictions.

Above: Vehicle size restrictions, Yellowstone National Park.  
Photo credit: Amalia Holub, US DOT Volpe Center

## CATEGORY: Operations/Access Management



### Factors That Could Increase Cost and Time

Implementation of the tool generally costs up to \$50,000 and takes less than one year to complete.

The expense and duration of vehicle size and type restrictions depends on the infrastructure used.

Factors that could increase cost and time:

- Adding or improving infrastructure such as gates and electronic systems.
- Establishing a visitor use management plan.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term costs for this tool include staff time for enforcement and communication. Where technology is used to monitor traffic, utilities, software/equipment upgrades, etc. may be needed.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- Rulemaking Process
- NPS *Management Policies 2006*, Chapter 8
- DO 22: *Recreation Fees*
- DO 77A: *Civic Engagement and Public Involvement*

# Vehicle Size/Type Restrictions

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	-	●	●	●	●	-

Restricting vehicles is a potentially controversial action and requires advance planning to identify the nature of the problems and impacts that have caused the park to consider taking this action. Care should be taken when determining and implementing longer-term restrictions to avoid unintended effects on visitor experience. Longer-term restrictions will therefore require a more complex process.

### PROS

- Reduces the chance that a vehicle will get stuck because of the road terrain.
- Decreases congestion by removing large, slower-moving vehicles.
- Reduces the need for large vehicle parking at some locations.
- Increases safety for pedestrians and cyclists sharing the roadway.

### CONS

- Requires consistent education and enforcement to be effective.
- Limiting larger vehicles to nonpeak times may impact deliveries.
- Restricting vehicle types could impact commercial bus tour operators and RVs.

### COORDINATION / PARTNERSHIPS

Communication outreach, signs, and coordination between the park and local law enforcement will be needed.

### ADDITIONAL CONSIDERATIONS

Alternative large vehicle parking and transit may be needed for visitors arriving in recreational vehicles.

Other tools that compliment vehicle size/type restrictions include: *Dynamic/Variable Message Signs, Pre-Arrival Visitor Congestion Information, On-Site Visitor Congestion Information, and Tour Bus Management.*

### ADDITIONAL RESOURCES

- 2020 Scotts Bluff National Monument has length, height, and trailer restrictions for Summit Road <https://www.nps.gov/scbl/planyourvisit/index.htm>
- 2019 Glacier National Park has vehicle restrictions on the Going-to-the-Sun Road <https://www.nps.gov/glac/planyourvisit/goingtothesunroad.htm>
- 2020 Mesa Verde National Park prohibits trailers on the main park road past the campground <https://www.nps.gov/meve/planyourvisit/gettingaround.htm>
- 2019 Sequoia and Kings Canyon National Parks restrict recreational vehicles from several areas <https://www.nps.gov/seki/planyourvisit/directions.htm> and <https://www.nps.gov/seki/planyourvisit/vehicle-restrictions.htm>
- 2013 Crater Lake National Park – East Rim Road Opens for Nonmotorized Recreation <https://www.nps.gov/crla/learn/news/east-rim-road-opens-for-non-motorized-recreation.htm>
- 2020 Mesa Verde National Park - Getting Around: Travel Restrictions <https://www.nps.gov/meve/planyourvisit/gettingaround.htm>

# Visitor Reservation Systems



National parks can use visitor reservation systems to manage the number of daily visitors and manage traffic congestion at popular destinations within a park. Visitor reservation systems are one of several Managed Access Strategies for demand placed on a destination that has limited capacity by allowing the number of visitors entering a location to be capped or limited to a maximum number. Reservation systems can be used for entering the entire park, to access a particular parking area or trail, or to take a tour.

Visitor reservation systems typically allow reservations to be made prior to arrival through the use of a website or telephone number. Many reservation systems in public lands are also set up to allow a certain amount of reservations to be made months or days ahead of the visitor arrival while holding some for the day of the reservations. This accommodates visitors who plan ahead to visit as well as those who decide to stop while passing through an area. While reservation systems are not a typical tool to manage parking for the National Park Service, an increasing number of parks are considering such systems as a way to manage increasing demand and maintain the visitor experience.

Above: Parking reservation required, Muir Woods National Monument. Photo credit: Heather Richardson, US DOT Volpe Center

**CATEGORY: Operations/Access Management**



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs \$50,000 to \$100,000 and takes one to three years to complete.

The expense and duration of implementing visitor reservation systems will depend on if the concessionaire is in charge of the reservation system or the park takes advantage of the already existing recreation.gov website for reservations.

Factors that could increase cost and time:

- The park's data and understanding related to visitation and duration of stay.
- Technological capacity.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include ongoing staff time to market and manage the reservation system as well as utilities, software updates, and technology repairs and replacement parts.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool. Consultation with regional planning office is required before considering this tool.

**Specific pre-implementation issues for use of this tool include:**

- 470 DM 2 - Digital Media Policy
- Policy Memorandum 11-02 - Social Media - Interim Policy
- NPS *Management Policies 2006*, Chapter 8
- DO 22: *Recreation Fees*
- DO 77A: *Civic Engagement and Public Involvement*

# Visitor Reservation Systems

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	-	-	●	●	●

Introducing a visitor reservation system requires approval from NPS Headquarters and the Washington Support Office (WASO). Parks considering a reservation system should work with their regional coordinators on conducting necessary analysis and developing a proposal for consideration by NPS management.

### PROS

- Manage the number of visitors allowed at a site or within the park at any given time, which can reduce vehicular and visitor congestion.
- May reduce delays and crowding and stress associated with searching for parking, thereby improving visitor experience.
- May reduce time for law enforcement by reducing time required to direct traffic.

### CONS

- Visitors unable to get a reservation may be disappointed if they are not able to access a site at the time they are visiting, especially when traveling long distances. It is critical that visitors have as much advanced knowledge as possible that some sites require a reservation (such as through information on the park website). If the reservation system is not marketed well, many visitors may arrive at a unit without realizing they needed prior reservations.
- Parks often play a significant role in tourism and support the local economy of a gateway community. A gateway community may see reservations as a detriment to the local economy and oppose implementation of such systems.

### COORDINATION / PARTNERSHIPS

Gateway communities sometimes view visitor reservation systems as limiting people from visiting their towns, and hence, limiting their economic security. Parks considering reservation systems should engage with their local communities on how the system is intended to be managed. Visitor reservation systems can also move demand from personal vehicles to transit systems that operate to or within the park. Coordination with local transit providers is also important to maintaining visitor access and experience while reducing congestion.

### ADDITIONAL CONSIDERATIONS

- A reservation system of any type will require extensive data collection and analysis and planning as well as coordination with regional leadership, park partners, and WASO and DOI.
- Design of a reservation system needs to consider questions, including: Will the system manage people or vehicles? What seasons or time of day are reservations needed? How will it change visitor access? and When will visitors have to make reservations?
- Design of reservation systems should consider alternative modes of transportation for visitor access to mitigate the reduction of cars allowed into the park.

# Visitor Reservation Systems

## Implementation Considerations, cont.

### ADDITIONAL RESOURCES

- 2020 Independence National Historical Park has a timed ticket entry to Independence Hall. Reservations can be made online or via their toll free telephone number. <https://www.nps.gov/inde/planyourvisit/independencehall.htm>
- 2020 Muir Woods began its parking and shuttle reservation system in 2018 to help resolve parking and traffic congestion <https://gomuirwoods.com/>
- 2020 Mammoth Cave recommends reservations for cave tour, but they are not required <https://www.recreation.gov/ticket/facility/234640>
- 2020 Denali National Park Road access beyond the first 15 miles requires use of a tour bus or shuttle, both of which charge fees and need reservations <https://www.recreation.gov/ticket/facility/300014>
- 2020 Mesa Verde has a reservation system for accessing Cliff Palace [https://www.nps.gov/meve/learn/historyculture/cd\\_cliff\\_palace\\_tour.htm](https://www.nps.gov/meve/learn/historyculture/cd_cliff_palace_tour.htm)
- 2020 Half Dome permits for day hikers are required seven days per week when the cables are up in May–September <https://www.nps.gov/yose/planyourvisit/hdpermits.htm>
- 2020 Haleakala National Park has required reservations for personal vehicles going to view sunrise since 2017 <https://www.nps.gov/hale/planyourvisit/haleakala-sunrise-reservations.htm>
- 2019 Pearl Harbor National Memorial Tickets <https://www.nps.gov/valr/planyourvisit/fees.htm>
- 2020 Mesa Verde National Park Purchasing Tour Tickets [https://www.nps.gov/meve/planyourvisit/tour\\_tickets.htm](https://www.nps.gov/meve/planyourvisit/tour_tickets.htm)



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# Parking Fees



Parking fees can be used effectively to address issues of parking supply and demand within a park. Adjusting parking fees by increasing costs at congested/high-utilization times or decreasing costs during noncongested/low-utilization times may encourage visitors to visit the parks during off-peak periods, to adjust their visitation times, or to use alternative modes. Free parking is known to create congestion, as more people will drive when they know that parking costs are nonexistent. Parking fees are especially important in areas when parks are adjacent to locations that already charge for parking. The impact of parking fees in reducing congestion is tied to enforcement of paying the parking fee, either through automated gates or law enforcement.

## CATEGORY: Parking



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs \$50,000 to \$100,000 and takes less than one to complete if the park already collects fees.

Factors that could increase cost and time:

- Coordination with regional and WASO Recreation Fee managers is needed.
- Changes to parking fees must be done through the annual fee rate call process.
- Additional infrastructure may need to be added to automate the fee collection process (automated gate access, automated fee machines, parking meters, parking management equipment). (see *Automated Gate Restriction*, *Prepayment of Fees*, and *Parking Management* tools)
- If fee collection is not already allowed, time to implement varies from 12 to 18 months.
- Implementation requires discussions to ensure adding or increasing parking fees is allowed at the park and planning for the pricing structure.
- Marketing this change to the public and local gateway community requires time and coordination.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include staff time to regularly update, print, and distribute promotional materials about the parking fees. For fee collection, the operation and maintenance costs would include staff time if fees are collected manually or utilities, software updates, and repair and replacement parts if fee collection is automated. Automated solutions will likely have a higher capital cost but may have a lower annual operating cost.



# Parking Fees

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool. Parks interested in adopting parking fees or revising their current system should contact the Recreation Fee Program. If the park does not already collect fees, they need to go through the public engagement and federal register process.

### Specific pre-implementation issues for use of this tool include:

- NPS Management Policies 2006, Chapter 8
- DO 22: Recreation Fees
- DO 77A: Civic Engagement and Public Involvement

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	-	-	-	-	-	●	-	●

### PROS

- Can shift visitors to other modes such as bicycling, walking, and transit.
- Creates revenue while possibly decreasing auto congestion.
- Can decrease vehicles circulating in parking areas, which can reduce congestion and pollution.

### CONS

- Units must petition and go through a public process to implement or adjust their fees (and there are several different types of fees).
- Visual impacts from parking meters/kiosks.
- Parking fees can cause affordability challenges for lower-income households.
- Some visitors would rather circulate in a full but free parking area to look for a parking spot than to pay a parking fee.
- Implementing this technique may just push the issue to a neighboring site.
- For smaller parking areas, collection costs are likely to exceed revenues but may also reduce enforcement costs.

### COORDINATION / PARTNERSHIPS

Coordination is needed with the regional and WASO Recreation Fee Program managers to evaluate whether adding or increasing parking fees is possible at a specific park. If parking fees were added to parking areas outside the park, coordination would be needed with the gateway community. Coordination will also be needed with local law enforcement or US Park Police for enforcement.

### ADDITIONAL CONSIDERATIONS

- Conducting a parking fee study in advance of implementation will assess feasibility of implementation, support the parks request to modify fees, and assess parking rates to avoid unintentional parking shifts, and assess potential fee revenue that could go back to the park as part of the Federal Lands Recreation Enhancement Act.
- Engagement and consensus from park law enforcement or US Park Police will be essential to successful enforcement.

For this tool, examples for measuring the ongoing effectiveness include: reduction in vehicles circulating within the parking area and fees collected in parking area.

# Parking Fees

## Implementation Considerations, cont.

### ADDITIONAL RESOURCES

- 2020 The Recreation Fee Program  
<https://www.blm.gov/programs/recreation/recreation-fee-program>
- 2017 Sandy Hook National Recreation Area has parking fees rather than an entrance fee <https://www.nps.gov/gate/faq-sandy-hook.htm#:~:text=%2415%20per%20car%20per%20day%20or%20%2475%20for%20a%20season%20pass.>
- 2019 The National Mall and Memorial Parks use parking fees from parking meters to support the DC Circulator service  
<https://www.nps.gov/nama/planyourvisit/parking.htm>
- 2019 Parking fees <http://www.vtpi.org/tdm/tdm26.htm>
- 2020 Gateway National Recreation Area Fees & Passes  
<https://www.nps.gov/gate/planyourvisit/fees.htm>



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# Parking Management



Parking is the most common congestion problem for NPS parks. Parking management can reduce the number of cars driving in circles looking for parking or blocking traffic waiting to enter a parking area. This tool includes a range of ideas, including:

- Directing visitors by park staff,
- Providing advanced notice of parking conditions (i.e., social media),
- Informing visitors, using advance signage, that a parking area is full and directing to alternative parking,
- Designating and enforcing some parking spaces or lots with a time or vehicle size limit,
- Redesigning lots to accommodate more vehicles and improve circulation,
- Restricting access to a parking area through the use of automated gates,
- Managing parking with a reservation system,
- Using a designated drop-off area,
- Creating/enhancing and communicating multimodal connections,
- Installing webcams,
- Charging a fee for parking (only if the park has no entrance fee), and
- Partnering with gateway communities on shared solutions.

For areas of the park with systemic parking congestion, a special event approach that integrates two or more of these strategies may be most useful. Working with partners on managing adjacent roadways in gateway communities, which may affect park roads, is critical.

## CATEGORY: Parking



### Factors That Could Increase Cost and Time

Implementation of this tool generally costs up to \$50,000 and takes less than one year to complete.

The expense and duration of the implementing parking management will depend on what approach is used, whether it be deploying staff and park personnel or implementing signage.

Factors that could increase cost and time:

- Staff time to engage in parking management.
- Electronic messages for monitoring the parking area.
- Automated gates and other mediums of access restriction.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

Long-term costs could include personnel time to monitor parking areas and/or enforcement of parking regulations. If a park chooses to use signage or automated systems, costs would also include utilities, software updates, and repairs and replacement parts.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapter 8
- DO 77A: *Civic Engagement and Public Involvement*

# Parking Management

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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### PROS

- Improves visitor experience by increasing efficiency and reducing frustration.
- Reduces the number of cars travelling in circles, blocking traffic, and creating unsafe conditions.
- Reduces waiting and circulation time and improves air quality.

### CONS

- Some visitors might not trust the information on a sign telling them that a parking area is full and decide to enter the lot to see for themselves, potentially leading to the problems that this tool seeks to avoid.
- Visitor frustration regarding lack of parking can be stressful for parking management staff.
- More than one parking management strategy may be needed to reduce congestion, increasing the complexity of this tool.

### COORDINATION / PARTNERSHIPS

Parks might want to post on social media and coordinate with local communities to disseminate real-time information about parking area availability to allow potential visitors to make adjustments to their plans in advance.

### ADDITIONAL CONSIDERATIONS

Offering parking availability information to visitors saves time and frustration. Depending on the approach to managing parking congestion, data collection may be useful to better understand the problem and help identify feasible strategies. One strategy is to document the authoritative parking status trends in an application programming interface (API) to automate park website updates. NPS.gov has been coordinating efforts to improve the availability of this option for parks.

Tools related to parking management include: *Vehicle Size/Type Restrictions, Data Collection and Analysis, Intelligent Transportation Systems (ITS), Visitor Reservation Systems, Pre-Arrival Visitor Congestion Information, and On-Site Visitor Congestion Information.*

### ADDITIONAL RESOURCES

- 2020 Acadia National Park: Acadia was interested in using this project to determine the number of parking spaces available at a given time <https://www.nps.gov/acad/index.htm>
- 2020 Acadia National Park Parking <https://www.nps.gov/acad/parking.htm>
- 2020 Canaveral National Seashore uses rangers and volunteers to monitor parking areas. When all lots are full, the park prevents additional visitors from entering the park. <https://www.nps.gov/cana/index.htm>
- 2020 GWMP and CHOH Great Falls Park: GWMP was interested in using this project to obtain better information on wait times for parking, while on the other side of the river CHOH was interested in data to determine the number of available parking spaces at a given time <https://www.nps.gov/gwmp/index.htm> and <https://www.nps.gov/choh/index.htm>
- 2020 Glacier National Park dashboard, showing parking availability based on the previous day's pattern <https://www.nps.gov/applications/glac/dashboard/>

# Parking Supply

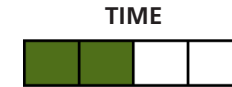


Inadequate parking supply can lead to parking on roadway shoulders and other unauthorized areas. Lack of parking can also be a major source of frustration for visitors and require park staff to direct traffic to prevent bottlenecks. In some cases, congestion in parking areas can be mitigated without expanding the footprint of the parking area. Parking management (see *Parking Management* tool), parking area improvements (such as redesigning/restriping the layout to improve flow), or promoting the use of existing park-and-ride facilities can improve parking area congestion.

Park-and-ride lots allow visitors to leave their car and travel through the park via transit and can be located in the gateway community (such as at Grand Canyon National Park and Muir Woods National Monument) and in the park itself (such as at Rocky Mountain National Park); however, this often increases the demand for parking and the end result is greater rather than less congestion. It is important to note that a park-and-ride facility, either on- or off-site, will not be successful without effective marketing. Marketing activities need to be exceptionally robust when the park-and-ride operation is first implemented and then must remain strong thereafter.

Above: Unfilled parking lot, Grand Teton National Park.  
Photo credit: Amalia Holub, US DOT Volpe Center

## CATEGORY: Parking



### Factors That Could Increase Cost and Time

Implementation of this tool generally costs up to \$50,000 and takes one to three years to complete.

The expense and duration of implementing changes to parking supply will differ drastically if the park chooses to construct an entirely new parking garage rather than redesigning an existing one.

Factors that could increase cost and time:

- Constructing a new parking garage.
- When redesigning an existing parking garage:
  - Adding spaces,
  - Multi-level and grade changes, and
  - Presence of sensitive drainage conditions.

Additionally, a park could elect to provide parking remotely in satellite lots. Remote (outside NPS) park-and-ride facilities may incur leasing costs, permits and/or written agreements. A way to move visitors to and from the park-and-ride will be needed, and that can be done via existing local transit services, by shuttle (see *Transit/Shuttle Services* tool), or by rideshare/bikeshare (see *Ridesharing* and *Bike Share and Bike Rental* tools).

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term costs for this tool include staff time to monitor the impacts of the tool and adapt/retest as needed.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapter 8
- DO 77A: *Civic Engagement and Public Involvement*

# Parking Supply

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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Increasing parking capacity will increase the number of visitors at a given destination, which may have adverse impacts on natural resources and visitor facilities if visitor capacity is a concern. “Latent demand” (a version of “if you build it they will come”) is a factor, and adding parking may have the counterintuitive effect of adding to congestion. Use of this tool requires careful consideration.

If a park-and-ride is an option, the cost of leasing land and operating or contracting a park-and-ride service will likely be higher for an urban park than a rural park. When considering park-and-ride as a potential solution, a park should engage other parks with existing park-and-ride services (along with their regional transportation coordinator) to learn about successes and lessons learned.

### PROS

- Can reduce parking area congestion and improve safety.
- Can reduce circling/idling of vehicles waiting for parking.
- The need for staff to manage parking can be reduced by providing more parking.
- Park-and-ride facilities promote mode shift to transit therefore decreasing the number of personal automobiles within the park.

### CONS

- When visitor demand for access to a parking area is high, adding parking can have a counterintuitive affect and increase congestion due to latent demand.
- If visitor capacity is a concern, adding parking (and therefore adding more visitors) may not be the right tool.
- Parking expansion may help in the short-term, but if visitation increases in the long-term, the issue may reappear or worsen.

### COORDINATION / PARTNERSHIPS

Coordination with the gateway community would be necessary if the park-and-ride lot will be constructed in the gateway community. The park needs to coordinate with the regional FLTP Coordinator if FLTP funds will be used and/or if parking is going to be expanded.

### ADDITIONAL CONSIDERATIONS

Visitors can arrive in a variety of vehicle types and parks should determine their need to accommodate larger vehicles, such as tour buses and RVs, when modifying or constructing a new parking facility. These vehicles require both larger parking spaces and the space to maneuver through the parking area.

To gauge the effectiveness of parking supply changes, collecting data on parking area occupancy pre- and post-modifications can be helpful.

### ADDITIONAL RESOURCES

- 2020 Capitol Reef restriped its Hickman parking area to improve the flow and efficiency as a recommendation from its 2015 Congestion Assessment. The parking area experienced over capacity issues and had poorly delineated parking spaces. <https://www.nps.gov/care/planyourvisit/directions.htm>
- 2015 Haleakala National Park Parking Lot Improvements Continue <http://www.nps.gov/hale/parknews/haleakala-national-park-parking-lot-improvements-continue.htm>
- 2015 Arches National Park Delicate Arch/Wolfe Ranch Parking Lot Construction Project to Begin in Arches National Park <https://www.nps.gov/arch/learn/news/news020915.htm>

# Congestion Assessment



Congestion Assessments are a review of existing park transportation congestion conditions and trends by an independent technical support team. Using a “problem-first” diagnostic approach, the team collects information from park staff, data from local transportation agencies (where available) and previous plans, along with proposed capital and planning projects to determine a range of feasible recommendations. Congestion Assessments are somewhat similar to Road Safety Audits (see *Road Safety Audit* tool), and can be for an entire park or a specific unit or area depending on the park’s needs.

Congestion Assessments begin with a request for assistance from the park to the regional Federal Lands Transportation Program Coordinator. The Congestion Assessment process includes:

- Pre-assessment screening interview,
- Three conference calls/webinars,
- Park congestion “hotspot” map in Park Atlas,
- Draft and final reports (roughly 25 pages), with short, medium, and long-term recommendations (focus is on low-cost, easy to implement solutions), and
- One post-assessment call to discuss implementation and potential pilots.

## CATEGORY: Planning



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs less than \$50,000 and takes less than one year to complete.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

Operations and maintenance costs associated with a Congestion Assessment are those that would be accrued from implementation of the recommended Toolkit tools. Congestion Assessments may be conducted for multiple sites, and a completed assessment could be updated if conditions change significantly, or with visitor use management efforts.

## Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

### Specific pre-implementation issues for use of this tool include:

- *NPS Management Policies 2006*, Chapters 2.3.1.4, 4.2.4, and 9.2



# Congestion Assessment

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	●	●	●	●	●

These benefits of Congestion Assessments can only be realized if the park implements the recommendations in the final report.

### PROS

- Low-cost effort that can be done quickly.
- Efficient use of staff time for maximum benefits.
- Helps park prioritize congestion issues for solution implementation.
- While the process is the same for all parks, the discussion and resulting recommendations are customized to the park’s needs.
- Typically funded through a WASO or regional program.
- Might be a first step toward a PMIS for a new project.

### CONS

- Coordination of park staff and support team schedules can be challenging; peak season assessments are generally avoided.
- Participation requires commitment to test at least one of the recommended tools.
- Usually limited to parks with emerging congestion issues rather than mature (long-term, systemic and complex) congestion, which is more suitable for a visitor use management framework.

### COORDINATION / PARTNERSHIPS

Congestion Assessments benefit from the participation of park staff from multiple disciplines, including law enforcement, interpretation, facilities management, and park administration. Coordination across these groups ensures the broad range of congestion perceptions are accounted for in the recommendations.

### ADDITIONAL CONSIDERATIONS

Congestion Assessments are a “problem first” activity, and the emphasis is on understanding the problems experienced by the park and visitors before offering recommendations. In addition, the park is expected to test at least one of the recommended tools within one year of completing an assessment.

### ADDITIONAL RESOURCES

- Congestion Assessments began in 2015. The following parks have completed assessments as of 2019: BLCA, CARE, CEBR, CHIC, CHOH (Great Falls, MD), COLM, CUVA, DETO, FOMC, GLAC (Many Glacier, North Fork and Two Medicine), GRSA, GWMP (Great Falls, VA), JOTR, KLGO (Skagway), MALU, MEVE, MIMA, MOCA, NATR (Jackson, MS, area only), ROVA (Home of FDR), SLBE, VIIS, WHSA, and WHIS.

Call the Congestion Management Program Manager at 303-969-2483 to discuss the assessment process and receive a sample completed assessment.

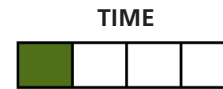
# Engage in Transportation Planning (DO 87D)



Good stewardship of NPS scenic driving experiences is an important part of managing park roads, trails, and transit. Particularly in urban and fast-growing areas, park roads may be negatively impacted by nonrecreational traffic (commuters and commercial traffic). Risks include pressure to widen roads or add direct connections to state highways/interstates; impacts typically include increases in speeds, accidents, non-visitor congestion, loss of key visitor experiences, and damage to resources. New roads, capacity expansions, or realignments of state and local roads can lead to increased congestion in a park by diverting pass-through traffic to NPS-owned roads.

Director's Order (DO) 87D requires parks to "participate early in all transportation planning studies and planning processes with state and local governments, Federal agencies, and regional planning bodies and citizen groups...Superintendents must take an active role in overall community and transportation planning activities to educate all parties about the NPS mandate to protect park resources."

CATEGORY: Planning



## Factors That Could Increase Cost and Time

Implementing DO 87D requires staff leadership time to establish ongoing engagement with state and local counterparts and to communicate with and participate in other agency's planning processes, which can vary greatly by park. The implementation timeframe for this tool is immediate (less than 1 year) and on-going, particularly in growing areas or for parkways.

These agencies conduct work that provides benefits NPS: data collection, managing air quality, congestion and safety, and improving connectivity and access. Understanding what transportation plans are under consideration locally will help parks reduce risks and impacts for the future. There are well-defined entry points for park participation in local transportation planning:

- Review and comment on long-range transportation plans and proposed changes to State and local roads within or near parks.
- Engage partners if the park notices that commuters are using park roads, if speeds and accidents are increasing or if nonrecreational (through traffic) exceeds 25% of the recreational traffic levels (available from the Public Use Statistics Office).
- Monitor transportation improvement programs for projects that may impact park roads.
- Get added to an agency's email distribution list for information about upcoming projects, plans, and community meetings.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapters 2 and 9.2
- DO 87D: *Non-NPS Roads*

# Engage in Transportation Planning (DO 87D)

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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### PROS

- Generate relationships with local transportation planning agencies that raise awareness of the NPS mission and how that relates to transportation issues.
- Protect NPS roads from commercial and commuter traffic impacts.
- Explore opportunities to provide improved community connections with trails and transit.

### CONS

- Limited staff and lack of transportation planning experience may hinder the park's participation.
- Staff turnover within the park can make it difficult to maintain relationships and continuity.

### COORDINATION / PARTNERSHIPS

Transportation planning occurs at many levels of government. Metropolitan Planning Organizations coordinate planning and project programming of federal funds in metropolitan areas, producing long-term (20 year) metropolitan transportation plans and short-term (4-5 years) transportation improvement programs. State Departments of Transportation (DOTs) produce statewide long-range transportation plans and transportation improvement programs. These programs incorporate metropolitan and nonmetropolitan transportation plans and improvement programs.

### ADDITIONAL CONSIDERATIONS

If an NPS-owned road is being impacted by changes in local traffic patterns outside the park, park management can work with cities, counties, towns, Metropolitan Planning Organizations, and departments of transportation to consider a range of options.

### ADDITIONAL RESOURCES

- 2010 Acadia National Park coordinates with Maine DOT about bus services. The Acadia Gateway Center partnership develops a regional transportation hub alongside Friends of Acadia, the Maine DOT, Downeast Transportation, the Town of Trenton, L.L.Bean, the Federal Transit Administration, and Maine's Congressional delegation. <https://www.maine.gov/mdot/publications/docs/plansreports/connectingmainefulldocument.pdf>
- 2000 Director's Order #87D: *Non-NPS Roads* [https://www.nps.gov/subjects/policy/upload/DO\\_87D\\_12-14-2000.pdf](https://www.nps.gov/subjects/policy/upload/DO_87D_12-14-2000.pdf)
- 2006 NPS Management Policy 9.2: Transportation Systems and Alternative Transportation [https://www.nps.gov/policy/mp/policies.html#\\_Toc157233016](https://www.nps.gov/policy/mp/policies.html#_Toc157233016)
- 2019 The Transportation Planning Process Briefing Book, nontechnical summary of roles and responsibilities [https://www.fhwa.dot.gov/planning/publications/briefing\\_book/](https://www.fhwa.dot.gov/planning/publications/briefing_book/)
- 2020 Friends of Acadia <https://friendsofacadia.org/what-we-do/sustainable-visitiation/the-acadia-gateway-center/>

# Engaging with Partners, Stakeholders, and the Public



“The National Park Service has long relied on partnerships with outside organizations to enhance resource protection and the visitor experience. The influence of the national park is felt well beyond its borders; we are part of a larger community of local, regional and state interests. Our dedication to resource protection and providing quality visitor experiences affect a broad array of citizens, government agencies, and interest groups. Partnerships allow us to tap the skills and resources of the larger community, and enable NPS to extend its mission outside park boundaries.” (source: NPS Transportation Planning Guidebook).

Typical partners with a shared interest in improving congestion often include visitors; town, city, county and state government agencies; businesses and Chambers of Commerce; nongovernmental organizations; Friends groups; and other Federal Land Management Agencies, etc.

One way to engage partners could be an informational workshop to identify congestion hotspots within and near the park and problems occurring at each location. Once a congestion map is complete, a walk-through of the Congestion Management Toolkit solutions may reveal possibilities for strategies and projects that could ease congestion.

## CATEGORY: Planning



### Factors That Could Increase Cost and Time

- There are no capital costs associated with stakeholder engagement,
- Specific involvement and outreach related to park actions or projects can be beneficial.
- Involving the public is an ongoing activity for national parks—it does not require a project or a NEPA activity.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The total operational cost for this tool is generally low (\$0 to \$50,000) and based on staff time for meetings and planning.

### Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

#### Specific pre-implementation issues for use of this tool include:

- 470 DM 2 - Digital Media Policy
- Policy Memorandum 11-02 - Social Media - Interim Policy
- NPS *Management Policies 2006*, Chapters 2 and 9.2
- DO 77A: *Civic Engagement and Public Involvement*
- DO 87D: *Non-NPS Roads*

# Engaging with Partners, Stakeholders, and the Public

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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### PROS

- Partnerships can help leverage resources to manage congestion and safety.
- Partner relationships help parks be aware of proposed local changes and new developments that could impact park operations, visitor experiences, and resources.

### CONS

- A lack of participation from stakeholders could be a barrier to the park's congestion management activities outside the park (including parking, business opportunities, etc.).
- Transportation strategies can be complex to explain to partners and the public because useful congestion management strategies can sometimes be counterintuitive.

### COORDINATION / PARTNERSHIPS

For this tool, the list of partners ranges from the public, to transit providers, to gateway communities, to Transportation Management Associations.

A list of typical transportation and congestion management partners and stakeholders can be found at:

<http://fedlandsinstitute.org/FLTIResources/PlanningResources/Default.html>

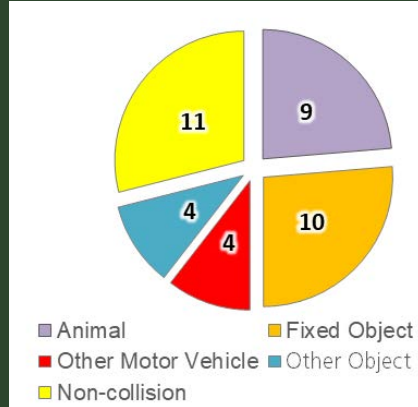
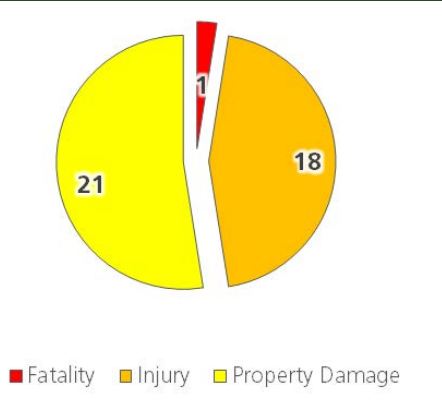
### ADDITIONAL CONSIDERATIONS

Staff changes in partner organizations and at the park can make sustaining a long-term relationship challenging. Coordination with partners may require written agreements, such as memoranda of understanding, memorandums of agreement, and other partnership instruments.

### ADDITIONAL RESOURCES

- 2020 Marsh-Billings-Rockefeller created multiple local partnerships to address congestion impacts <https://www.nps.gov/mabi/index.htm>
- 2020 Great Sand Dunes works with firefighters in Alamosa, CO, to help manage congestion over the Memorial Day holiday weekend <https://www.nps.gov/grsa/index.htm>
- 2020 Klondike Gold Rush National Historical Park staff work regularly with leaders in the Municipality of Skagway, AK, to address pedestrian and traffic congestion issues <https://www.nps.gov/klgo/index.htm>
- 2019 NPS' Rivers, Trails and Conservation program targets community assistance projects <https://www.nps.gov/orgs/rtca/index.htm>
- 2020 The Federal Lands Access Program (FLAP) provides funding to partnerships seeking to improve transportation facilities (including congestion relief projects) that provide access to, are adjacent to, or are located within Federal lands <https://highways.dot.gov/federal-lands/programs-access>
- 2006 NPS Director's Orders 21, 75, and 87D <https://www.nps.gov/applications/npspolicy/DOrders.cfm>
- 2019 NPS Common Learning Portal: Audience Centered Interpretation Trainers Guide <https://mylearning.nps.gov/library-resources/audience-centered-trainers-guide/>

# Road Safety Audit



A Road Safety Audit (RSA) is the process by which an independent, multidisciplinary team assesses the safety performance of an existing or proposed road or intersection, considering all potential impacts on road users. RSAs work well in conjunction with congestion management as they focus on reducing conflicts between vehicles, pedestrians, and bicyclists, which are challenges also associated with congestion.

RSAs have three phases—pre-audit, audit, and post-audit. The duration of the pre-audit phase is dependent upon coordinating schedules of the team, gathering and analyzing data, and related activities. The audit phase includes the site visit and developing preliminary findings. The post-audit stage involves drafting a final report, communicating the results with the park, and implementing the suggestions. During the post-audit, the park (or requestor of the RSA) will also formulate a formal response to the recommendations in the report. The response typically addresses next steps the facility owner will undertake in pursuing the recommendations in the report.

The start of an RSA begins with a call to the regional Federal Lands Transportation Program Coordinator. Once the RSA is complete, the coordinator can help identify funding opportunities to implement some of the RSA recommendations.

## CATEGORY: Planning



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs less than \$50,000 and takes less than one year to complete.

The cost of RSAs varies based upon several factors, including:

- Composition of the RSA team and number of team members.
- Level of complexity of technical issues.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

There are no long-term operation and maintenance costs directly associated with an RSA since they are one-time exercises. However, the safety changes recommended as a result of the RSA may include operation and maintenance costs once implemented.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- *NPS Management Policies 2006*, Chapters 2 and 9.2

# Road Safety Audit

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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### PROS

- Parks can conduct RSAs for low cost and low time commitment.
- When conducting RSAs as part of project development, there is an opportunity to identify safety concerns during the project design stage, allowing parks to make adjustments prior to construction, which can reduce cost and save time later in the implementation process.
- RSAs can be used to help identify and prioritize safety improvement projects.
- RSAs can enhance coordination between park staff and local stakeholders such as state/local government contacts.
- Typically, projects generated with safety components generally score higher.

### CONS

- RSAs are usually funded by the region.
- Implementation of recommendations may require outside park technical support.

### COORDINATION / PARTNERSHIPS

Parks should also identify stakeholders who can provide contextual information about the RSA site.

### ADDITIONAL CONSIDERATIONS

There is a strong relationship between safety and congestion. The RSA team may want to provide some high-level observations on this relationship while conducting the RSA.

### ADDITIONAL RESOURCES

- 2019 FHWA Repository of RSA Resources <https://safety.fhwa.dot.gov/rsa/resources/>
- 2006 FHWA Road Safety Audit Guidelines [https://safety.fhwa.dot.gov/rsa/guidelines/documents/FHWA\\_SA\\_06\\_06.pdf](https://safety.fhwa.dot.gov/rsa/guidelines/documents/FHWA_SA_06_06.pdf)
- 2012 Grand Teton National Park Road Safety Audit [https://www.nps.gov/grte/learn/management/upload/GrosVentreJctBRSA\\_ReportGrandTetonNP11-30-12.pdf](https://www.nps.gov/grte/learn/management/upload/GrosVentreJctBRSA_ReportGrandTetonNP11-30-12.pdf)
- 2014 Road Safety Audit for the Lincoln Memorial Circle [https://westerntransportationinstitute.org/wp-content/uploads/2018/02/TRIPTAC\\_TA-LincolnMall\\_RSA.pdf](https://westerntransportationinstitute.org/wp-content/uploads/2018/02/TRIPTAC_TA-LincolnMall_RSA.pdf)

# Transportation Plan



Transportation plans study conditions related to parking, congestion, safety, queueing, access, mobility, connectivity, impacts to visitor experience and resources, and then identifies opportunities to improve current conditions. The process typically includes:

- Seeking technical support and funding for the plan,
- Identifying transportation problems (congestion, safety, asset conditions, services, mobility, wayfinding, impacts, risks, etc.),
- Establishing baseline/current conditions (collect and analyze data),
- Exploring desired future conditions,
- Engaging the public and stakeholders,
- Creating a goal for alternatives based on the above analysis, and
- Creating a range of alternatives along with cost estimates and likely trade-offs.

Transportation plans focus offer include short-, mid-, and long-term solutions. They are useful for parks experiencing rising visitation, changes in visitor use patterns, impacts from commuter traffic, rising accident frequency or increasing congestion, or an interest in increasing connections with local transportation services. A Congestion Assessment or Road Safety Audit may be an interim step toward a transportation plan or replace the need for a plan entirely.

## CATEGORY: Planning



## Factors That Could Increase Cost and Time

Transportation plans generally cost \$250,000 to \$500,000 and take three to five years to complete.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

There are no operation and maintenance costs associated with a transportation plan.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

### Specific pre-implementation issues for use of this tool include:

- NPS *Management Policies 2006*, Chapters 2, 8, and 9.2
- DO 77A: *Civic Engagement and Public Involvement*
- DO 87D: *Non-NPS Roads*



# Transportation Plan

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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Transportation plans are eligible for funding through the Federal Lands Transportation Program. Parks interested in undertaking a transportation plan should contact their regional coordination for more information. These plans are typically complex and challenging to create and implement; designating a park “champion” for this process may be helpful to keep the development process moving forward and ensuring that the preferred alternative is fully implemented.

### PROS

- Transportation plans can be useful if they:
  - Assess all of a park’s transportation assets in a comprehensive document,
  - Lay out the various solutions a park can choose from to address transportation challenges, and
  - Help parks prioritize transportation improvement projects.

### CONS

- Transportation plans are often expensive, take several years to complete, and require consistent focus to implement.
- The preferred alternative for a transportation plan may shift during changes to park management.
- Projects recommended in a transportation plan often require an NPS staff person to champion them through implementation. The absence of such a person may result in none of the recommendations being put into practice on the ground.

### COORDINATION / PARTNERSHIPS

Successful transportation plans consider input from various stakeholders, including local governments, other Federal Land Management Agencies, companies that operate within the park (like concessions or transit operators, if applicable), park staff, etc.

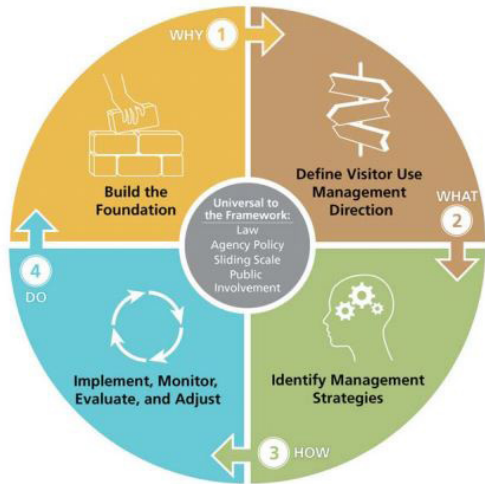
### ADDITIONAL CONSIDERATIONS

Transportation plans do not directly improve transportation conditions. The projects and operational changes identified in the plans can only do so if projects are fully implemented.

### ADDITIONAL RESOURCES

- 2006 Arches National Park Transportation Implementation Plan <https://parkplanning.nps.gov/document.cfm?parkID=25&projectID=14558&documentID=16798>
- 2019 Acadia National Park Final Transportation Plan and Final Environmental Impact Statement Released <https://www.nps.gov/acad/learn/news/final-transportation-plan-released.htm>

# Visitor Use Management Planning

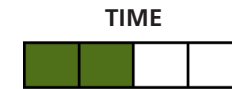


The visitor use management planning process examines current and potential visitor opportunities and develops long-term strategies to provide access, connect visitors to the park’s fundamental resources and values, and manage use. The plan incorporates best practices for managing visitor use to protect resources and promote high-quality visitor experiences. This type of plan is intended to provide for the implementation of effective visitor use management consistent with legal and policy requirements. A visitor use management plan can

- Assess the appropriateness of new visitor activities,
- Help align public expectations with visitor opportunities,
- Manage visitor demand at popular destinations,
- Balance trade-offs between different visitor use management strategies.

Planning for and managing visitor use is at the heart of the National Park Service mission. Proactively planning for visitor use supports responsive management that increases the ability of the National Park Service to encourage access and maximize visitor opportunities. A visitor use management plan builds on a park’s foundation document and other existing plans (e.g., general management plans, long-range interpretive plans, transportation plans, etc.).

CATEGORY: Planning



## Factors That Could Increase Cost and Time

Implementation of this tool costs \$50,000 to \$100,000 and takes one to three years to complete.

Potential funding sources include Park Planning and Special Studies – Unit Management Plan fund source, Environmental Quality Division fund source, Recreational Fee Fund Sources. The regional office can provide technical and funding support and other resources to parks who feel visitor use management is needed as part of an overall visitor use and transportation management plan.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

There are no operation and maintenance costs associated with visitor use management planning.

## Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapters 2, 8, and 9.2
- DO 77A: *Civic Engagement and Public Involvement*

# Visitor Use Management Planning

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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Maximizing visitor opportunities and minimizing resource impacts requires a comprehensive and interdisciplinary approach, including collaboration with other NPS programs. Depending on visitor use issues and needs at the park, the planning process may include:

- Analysis of the feasibility and appropriateness of new or expanded recreation opportunities.
- Guidance on providing and managing particular visitor activities and visitor use facilities.
- Strategies for addressing various visitor use issues
- Documentation of desired conditions along with indicators, thresholds, and capacities.

### PROS

- Aligns public expectations with visitor opportunities.
- Reduces conflicts between different user groups or between visitors and wildlife; minimizes impacts to resources and visitor experiences caused by visitor use.
- Manages visitor demand at popular destinations.

### CONS

- Requires an IDT from across the unit to inform the project for the life of the planning process.
- Plans do not reduce congestion—only plan implementation can do that.

### COORDINATION / PARTNERSHIPS

Parks should coordinate with stakeholders, including gateway communities, to understand potential negative impacts of visitor use and the potential for enhanced visitor opportunities. VUM plans typically include a civic engagement strategy to help support the planning process.

### ADDITIONAL CONSIDERATIONS

The NPS follows the Interagency Visitor Use Management Council's (IVUMC) Visitor Use Management Framework to develop visitor use management plans. For more information about the IVUMC and the VUM Framework please visit [www.visitorusemanagement.nps.gov](http://www.visitorusemanagement.nps.gov)

### ADDITIONAL RESOURCES

- 2018 Haleakala National Park Kipahulu Comprehensive Area Plan <https://parkplanning.nps.gov/document.cfm?parkID=306&projectID=27401&documentID=91038>
- 2020 Interagency Visitor Use Management Council <https://visitorusemanagement.nps.gov/>
- 2018 Petroglyph National Monument Visitor Use Management/Environmental Assessment <https://parkplanning.nps.gov/document.cfm?parkID=89&projectID=66887&documentID=91665>
- 2017 Zion National Park Visitor Use Management/Environmental Assessment <https://parkplanning.nps.gov/documentsList.cfm?parkID=113&projectID=58542>

# Acceleration/Deceleration Lanes



Traffic flow in parks can be influenced by the speed of vehicles, which is affected by factors such as sightseeing, turning movements, and the grade (steepness) of roads. While increasing speed and efficiency of roadways is not the focus of parks, acceleration/deceleration lanes, also known as speed-change lanes, can improve overall road safety and roadway congestion for to improve visitor experience.

“Climbing” or “passing” lanes allow faster vehicles to use a separate lane to pass slower vehicles. Turning lanes can act as deceleration lanes and provide the opportunity for a vehicle to exit the main travel lane and reduce its speed before making a turn at an intersection, parking area entrance, etc. The benefit of a turning lane is that vehicles in the main travel lane do not have to slow down or stop for a turning vehicle, which can be a cause of roadway congestion when there are frequent turning movements from the main travel lane.

Since adding a lane to a roadway through reconstruction is a complex undertaking in a park, this is a tool that should only be used in special circumstances.

## CATEGORY: Roadway



## Factors That Could Increase Cost and Time

Implementation of this tool generally costs above \$250,000 and takes three to six years to complete.

Factors that could increase cost and time:

- Whether the roadway is located in an environmentally sensitive area with challenging terrain.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include restriping, repaving or resurfacing, patching potholes, snow removal, sand application and removal, and other maintenance.

## Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapter 9
- DO 87A: *Park Roads and Parkways*

# Acceleration/Deceleration Lanes

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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### PROS

- Acceleration/deceleration lanes can separate slow moving vehicles from the traffic flow (for a segment of the roadway), and improve the overall flow of traffic.
- Acceleration/deceleration lanes are especially valuable in parks that have a significant number of visitors arriving by RVs because these motorists often have a hard time maintaining speeds on roads with steep grades.

### COORDINATION / PARTNERSHIPS

Coordination and permits will be needed with the local gateway community and local and/or state Department of Transportation if the lanes are proposed outside of the park and with the appropriate Federal Lands Highway division if the lanes are added inside the park. If the roadway footprint is enlarged, close coordination with natural and cultural resource staff will help maintain a balance of visitor access and preservation.

### CONS

- Adding acceleration/deceleration lanes means adding new lanes to park roads, which need to be carefully designed to avoid or minimize impacts to natural resources.
- Adding lanes to roadways can be an expensive option. It may be possible to get a similar affect by creating pull-outs or turn-outs (see *Roadway Pull-Outs* tool) instead.
- Adding acceleration lanes can lead to excessive speeds.

### ADDITIONAL CONSIDERATIONS

Before expanding any roadway, the park should consider all other feasible and appropriate options such as restricting left turns. In addition, the park will need recent traffic data (average daily trips) collected at the location of the proposed lane to calibrate the design.

### ADDITIONAL RESOURCES

- 2020 Mount Rainier National Park has acceleration lanes in some steep sections of roadway <https://www.nps.gov/mora/index.htm>
- 2020 Parks considering the addition of acceleration/deceleration lanes include: Petersburg National Battlefield and Fredericksburg and Spotsylvania National Military Park <https://www.nps.gov/pete/index.htm> and <https://www.nps.gov/frsp/index.htm>
- 2020 Natchez Trace Parkway has turning lanes near I-55 in Ridgeland, MS <https://www.nps.gov/natr/index.htm>
- 2020 Great Smoky Mountains National Park has turn lanes of the Gatlinburg-Pigeon Forge Spur of the Foothills Parkway <https://www.nps.gov/grsm/index.htm>

# Intersection Improvements



Intersection improvements through the use of traffic control devices (including signage) and geometric changes can improve the flow of vehicles through a park site and reduce congestion.

There are several traffic control device intersection improvement options. The Manual on Uniform Traffic Control Devices (MUTCD) provides guidance on which levels of intersection control are appropriate for varying volumes of traffic. The different intersection control options include yield signs, stop signs, multi-directional stop signs, and traffic signals. Geometric intersection changes like roundabouts, traffic circles, and turning lanes may also be used to improve the flow of traffic through intersections (see *Traffic Calming*, *Roadway Geometry Improvements*, and *Acceleration/Deceleration Lanes* tools).

## CATEGORY: Roadway



### Factors That Could Increase Cost and Time

The general implementation timeframe for this tool is immediate and the cost is low.

Factors that could increase cost and time:

- Solutions with a large “footprint” can span years for planning, design, NEPA and construction.
- Study of proposed intersection changes.
- Study of potential additional right-of-way purchase as part of a road project.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include implementing an inventory/inspection/repair program to maintain the intersection in good condition and replace striping, signage, traffic signals, etc. as they become worn or damaged. The installation of traffic signals and streetlights will incur additional utility costs.

### Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapter 9
- DO 77A: *Civic Engagement and Public Involvement*
- DO 87A: *Park Roads and Parkways*
- DO 87D: *Non-NPS Roads*

# Intersection Improvements

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
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Changing an intersection to improve congestion in one area may have impacts elsewhere in the park. Piloting changes to an intersection enables the park to observe how the changes impact both the targeted location as well as others in the unit. Decisions about which improvements to choose should take into account the number of vehicles, pedestrians, and bicyclists using the intersection per day, the number of users at peak hours, the number of travel lanes across modes, and other factors such as the ability to improve the safety of the intersection.

### PROS

- Reduced travel delay.
- More orderly flow of traffic.
- Reduced number and severity of crash incidents.
- Improved pedestrian and trail crossing safety.

### CONS

- Potential for increased travel delay during off-peak times when vehicles are required to stop when no conflicting vehicles are present.
- Increased “visual clutter” when adding signage and traffic signals that can detract from the natural surroundings.
- Some intersection improvements, like roundabouts, require a larger footprint and may impact natural resources.
- Increased flow of traffic at an intersection may create congestion issues downstream when those facilities are not equipped to handle the additional traffic.

### COORDINATION / PARTNERSHIPS

Identification of intersection improvements requires support by transportation engineers and others. The regional FLTP Coordinator and the regional Federal Lands Highway division office can assist with identifying resources for this evaluation. The regional Lands office must be involved in any land acquisition project.

### ADDITIONAL CONSIDERATIONS

When implementing intersection improvements, consider all the current and future user groups of the roadway: passenger vehicles, RVs, tour buses, delivery vehicles, bicyclists, and pedestrians, etc. To gauge the effectiveness of intersection improvement changes, collecting data on the following performance measures pre and post modifications can be helpful: reduced number of severe crashes.

### ADDITIONAL RESOURCES

- 2020 Colonial National Historic Park (at its “5 Points intersection”) and Valley Forge National Historic Park (at the intersection of PA 23 and PA 252) are considering roundabouts [nps.gov/colo/index.htm](https://www.nps.gov/colo/index.htm) and [nps.gov/vafo/index.htm](https://www.nps.gov/vafo/index.htm)
- 2020 FHWA Intersection Safety Resources <https://safety.fhwa.dot.gov/intersection/conventional/unsignalized/>
- 2017 FHWA Traffic Calming ePrimer [https://safety.fhwa.dot.gov/speedmgt/traffic\\_calm.cfm](https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm)
- 2017 Yosemite National Park Road and Campground Improvements <https://www.nps.gov/yose/learn/news/yosemite-national-park-implements-road-and-campground-improvements.htm>
- 2012 Manual on Uniform Traffic Control Devices (MUTCD) <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/mutcd2009r1r2edition.pdf>
- 2018 Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis <http://www.trb.org/Main/Blurbs/175169.aspx>

# Road Capacity



Increasing the number of lanes through reconstruction should be considered only in rare circumstances such as when it would increase safety. Reconstruction is a very expensive tool with varied effectiveness in reducing congestion—adding a full lane can have a “rebound” effect and actually increase congestion.

Increasing roadway capacity can in some circumstances reduce congestion by reallocating available space for vehicles, increasing throughput, and allowing space for vehicles to pass slow moving or turning vehicles or cyclists. A number of methods can be used to add capacity, including:

- Reducing lane width to allow for additional lanes on existing pavement width,
- Using shoulders as lanes during peak hours and in peak directions,
- Increasing the number of lanes through reconstruction,
- Adding turn lanes or passing lanes (see *Acceleration/Deceleration Lanes* and *Roadway Geometry Improvements* tools),
- Modifying roadway striping,
- Removing bicyclists and pedestrians from vehicular travel lanes by creating separate bicycle and pedestrian facilities (see *Bicycle/Pedestrian Facilities* tool), and
- Increasing the use of higher occupancy vehicles (i.e., transit system or tour buses) over personal vehicles (see *Transit/Shuttle Services*, *Improve Existing Transit Services*, and *Tour Bus Management* tools).

## CATEGORY: Roadway

### COST



### TIME



## Factors That Could Increase Cost and Time

The total capital cost for this tool is higher and the implementation timeframe is longer term.

Factors that could increase cost and time:

- Urban or remote locations.
- If the park has to obtain additional land.
- If the road improvements are in an environmentally or historically sensitive area.
- Projects that expand the existing roadway footprint.
- Difficult topography.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications include restriping roads, repaving or resurfacing, patching potholes, snow removal, sand application and removal, and other maintenance.

## Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapters 2, 8, and 9
- DO 87A: *Park Roads and Parkways*



# Road Capacity

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
-	-	●	-	●	○	●	-	-

Bicycle and pedestrian safety may be improved through this tool if road capacity improvements include accommodations for separate bicycle and/or pedestrian facilities, enhancement of crossings, etc.

Projects related to changing road capacity should include a study to collect and analyze traffic data and determine the desired vehicle capacity, feasibility, and possible alternatives.

### PROS

- Adding capacity through additional lanes can reduce congestion while increasing throughput.

### CONS

- Very expensive and complicated tool to implement.
- While using shoulders or decreasing current lane widths, allow additional lanes to be added without reconstruction; these methods may decrease safety.
- Additional lanes will typically widen the footprint of the transportation corridor and can negatively impact wildlife and the protected resources.
- Increased roadway vehicle capacity may negatively impact visitors' park experiences by generating additional noise, dust, and pollution.

### COORDINATION / PARTNERSHIPS

Coordination will be needed with the region, and the appropriate Federal Lands Highway Division or Denver Service Center. Depending on the location and extent of improvements, coordination with the state Department of Transportation may be required.

### ADDITIONAL CONSIDERATIONS

- Construction or expansion of a roadway is challenging (complex terrain, funding, impacts, and the timing of construction season [generally during peak visitation]).
- Adding roadway capacity will likely increase visitation—adequate facilities (parking, pullouts, etc.) will be needed to accommodate increased visitation.
- Long-term asset management costs should be considered along with the cost of construction.
- To gauge the effectiveness of modifying roadway capacity, collecting data on the following performance measures pre- and post-roadway modification can be used: traffic counts.

### ADDITIONAL RESOURCES

- 2020 U.S. 101 near Lake Crescent in Olympic National Park utilizes periodic passing lanes to allow slower-moving vehicles like RVs and logging trucks to be passed <https://www.nps.gov/olym/index.htm>
- 2020 CDOT I-70 Mountain Corridor Management Options <https://www.codot.gov/>
- 2014 Innovative Options for Congestion Relief on I-70 Mountain Corridor <https://www.codot.gov/news/2014-news-releases/03-2014/cdot-continuing-to-test-innovative-options-for-congestion-relief-on-i-70-mountain-corridor>

# Roadway Geometry Improvements



There are several tools in this Toolkit that cover specific roadway geometry improvements that are unique in their application and feasibility. These include Road Capacity, Intersection Improvements, and Acceleration/Deceleration Lanes. This tool includes some additional roadway geometry improvements that are more general, such as:

- Eliminate left turns from intersections. This is a design that can increase capacity where adding lanes is not feasible. Examples include the quadrant left turn, continuous flow, bow-tie, and displaced left turn intersections. Signalization is not typically applicable in these intersections.
- Right/left turn lanes at intersections. These lanes give drivers a designated space to wait for a gap in traffic. The lanes are only long enough to handle the expected number of vehicles queued waiting to turn. Because they are short, they are less expensive than adding an extra lane for the entirety of the roadway but are most effective when accurately predicting the number of cars that will use the lane.

CATEGORY: Roadway



## Factors That Increase Cost and Time

The total capital cost for this tool is low and the implementation timeframe is nearer term.

Factors that could increase cost and time:

- If the project involves roadway reconstruction or is in an environmentally sensitive area.
- Projects that require thorough planning, design, environmental review, and construction.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term operation and maintenance costs for this tool are highly variable depending on the specific improvement, which can range from restriping to major reconstruction.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapter 9
- DO 87A: *Park Roads and Parkways*

# Roadway Geometry Improvements

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
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### PROS

- Improved throughput and maintained capacity for through lanes of traffic.
- Improved safety by reducing potential conflicts between turning vehicles and through traffic.

### CONS

- Lane space and lack of sufficient right-of-way are the primary limitations of the intersection approaches.
- May require additional space for lanes and/or intersections, which may degrade the natural resources the park is trying to protect.

### COORDINATION / PARTNERSHIPS

Initial identification of strategies that are most appropriate for a specific location might best be determined by transportation engineers and experts who work for consultants or state or local departments of transportation in the region. Coordination may also be needed with the local Federal Lands Highway division office.

### ADDITIONAL CONSIDERATIONS

- A traffic study could analyze how current facilities are functioning and what improvements would likely result from implementing geometric changes.
- For this tool, examples for measuring the ongoing effectiveness include: average vehicle delay (intersection improvements) and average vehicle speed (mainline improvements).
- Traffic calming tools can be used in conjunction with roadway geometry improvements (see *Traffic Calming* tool).

### ADDITIONAL RESOURCES

- 1984 FHWA Park Road Standards <https://highways.dot.gov/federal-lands/design/library/park-road-standards>
- 2016 Transportation Research Board, Highway Capacity Manual <http://www.trb.org/Main/Blurbs/175169.aspx>
- 2018 AASHTO A Policy on Geometric Design of Highways and Streets <https://aashtojournal.org/2018/09/28/aashto-releases-7th-edition-of-its-highway-street-design-green-book/>
- 2017 State roadway design manuals <https://www.fhwa.dot.gov/design/>

# Roadway Pull-Outs



Vehicles moving more slowly than normal traffic cause traffic backups and congestion. Shuttles stopping in the traffic flow for passenger pick-ups/drop-offs can have the same effect. One solution is to use roadway pull-outs, which can provide space for slower moving vehicles to pull off the main roadway and allow faster traffic to pass. Roadway pull-outs can also support scenic viewing experiences / overlooks and interpretive wayside areas as well as provide amenities for visitors such as additional parking, comfort stations, and shuttle stops.

Above: Roadway pull-out, Grand Teton National Park.  
Photo credit: Amalia Holub, US DOT Volpe Center

## CATEGORY: Roadway



### Factors That Could Increase Cost and Time

Implementation of this tool generally costs \$50,000 to \$100,000 and takes one to three years to complete.

Factors that could increase cost and time:

- Paving the pull-outs.
- Larger pull-outs.
- Proximity of amenities/facilities provided.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include roadway maintenance such as plowing, sanding, sweeping, and repaving.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- NPS *Management Policies 2006*, Chapter 9
- DO 87A: *Park Roads and Parkways*

# Roadway Pull-Outs

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
-	-	●	-	●	○	●	●	●

### PROS

- Roadway pull-outs can reduce congestion by temporarily removing slower traffic from the traffic stream.
- Roadway pull-outs can provide additional locations for other visitor activities.

### CONS

- While roadway pull-outs allow slower traffic to exit the main traffic stream, this could increase the roadway speed and cause a safety issue.
- Roadway pull-outs can be used as temporary parking spaces, which defeats the purpose of installing them as a congestion mitigation technique.
- Roadway pullouts add access points to the roadway system, which can increase congestion. Be sure to consider site distances and spacing of all access points.

### COORDINATION / PARTNERSHIPS

If the roadway is not an NPS-owned road, coordination will be needed with the jurisdiction responsible for the right-of-way such as city, county, and state departments of transportation to receive a permit for installation of a roadway pull-out.

### ADDITIONAL CONSIDERATIONS

Roadway pull-outs can reduce vehicle conflicts by being designated right-in/right-out. This will eliminate left turns and reduce accident situations but may result in the need for additional pullouts on the opposite side of the road.

### ADDITIONAL RESOURCES

- 2020 Sleeping Bear Dunes National Lakeshore has pull-outs on the Pierce Stocking Scenic Drive <https://www.nps.gov/slbe/index.htm>
- 2020 Zion National Park has pullouts for recreation vehicles (East Entrance road) <https://www.nps.gov/zion/index.htm>
- 2020 Yellowstone National Park has multiple road pull-outs along the Grand Loop <https://www.nps.gov/yell/index.htm>
- 2002 Scenic Byways – A Design Guide for Roadside Improvements <http://www.fs.fed.us/eng/pubs/pdf/fhwa02001.pdf>

# Traffic Calming



Traffic calming has been used successfully in neighborhoods, main streets, and historic districts. This technique works by changing driver perception and adding “self-enforcing” physical methods that keep drivers moving at a steady, slower pace. Traffic calming measures include:

- **Speed humps or tables:** a raised area placed across the roadway to physically limit vehicle speed.
- **Roundabouts:** designed for an intersection that meets traffic signal thresholds.
- **Lateral shifts:** visually realign a straight street through changes in striping or flexible delineators.
- **Corner “bulb-out”/choker:** an extension of the sidewalk into the street resulting in a narrower roadway and more pedestrian space; either a corner or midblock.
- **Road diet/reduce number of lanes:** repurposes the roadway for bicycle lanes, pedestrian refuge islands, transit, and/or on-street parking.
- **On-street parking:** effectively narrows the roadway travel lanes by adding “side friction” to the traffic flow, while creating more parking in crowded areas.

Many traffic calming methods can be piloted using traffic cones, flexible delineators, or other temporary traffic control devices. These pilots should be small-scale, time-limited, and reversible; they may be a first step to longer-term solutions to reduce congestion and improve safety.

## CATEGORY: Roadway



## Factors That Could Increase Cost and Time

The typical cost of this tool is less than \$50,000. It generally takes one to three years to implement.

Factors that could increase cost and time:

- Extensive improvements that require design, environmental review, and construction.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

Long-term cost implications for this tool include staff time for enforcement; maintenance and repairs; restriping; pavement resurfacing; repainting; snow and sand removal; and landscaping and mowing.

## Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- *NPS Management Policies 2006*, Chapter 9
- *DO 87A: Park Roads and Parkways*

# Traffic Calming

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
-	-	●	-	●	●	●	-	●

### PROS

- Can improve safety of pedestrians and bicycle riders.
- Provides opportunities for plantings and other aesthetic improvements.

### CONS

- Increases travel times.
- May have undesirable impacts to viewsheds or cultural landscapes.
- Changes in pavement texture/treatment can affect ambient noise levels.

### COORDINATION / PARTNERSHIPS

Coordination efforts should involve cultural and/or historic landscape experts and resource specialists in the decision and design process. Input from the public on the various options/improvements should be sought. If the park does not own the road, coordination will be needed with the jurisdiction responsible for the roadway (such as city, county, or state Department of Transportation). Implementation of traffic calming along roads inside parks typically will require coordination with the regional Federal Lands Highway Division.

### ADDITIONAL CONSIDERATIONS

When implementing traffic calming measures, consider the following:

- Appropriate alternative routes for through traffic.
- Types or modes of traffic using or crossing the roadway.

### ADDITIONAL RESOURCES

- In 2009 The Presidio launched temporary street closures as a traffic calming measure to tame cut-through traffic patterns <https://sf.streetsblog.org/2009/09/29/presidio-launches-temporary-street-closure-and-traffic-calming-study/>
- 2017 Traffic Calming ePrimer [https://safety.fhwa.dot.gov/speedmgt/traffic\\_calm.cfm](https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm)
- 2020 Traffic Calming and Complete Streets <https://www.planning.org/research/streets/>
- 2020 2020 Haleakala National Park installed traffic calming devices as part of its “Slow Down for Nene” campaign to reduce wildlife mortality on park roads <https://www.nps.gov/hale/index.htm>
- 2020 On Rock Creek Park installed speed tables (similar to speed humps but flat-topped and longer) on both sides of a new crosswalk for Beach Drive <https://www.nps.gov/rocr/index.htm>
- 2015 Colorado National Monument Traffic Calming Devices to be Installed <http://www.nps.gov/colm/parknews/traffic-calming-devices-to-be-installed.htm>

# Traffic Circulation Changes



Congestion is not always the result of slow moving vehicles, vehicles parked along roadsides, accidents, or “animal jams.” Congestion can also result from the way vehicles circulate into or throughout a park. If circulation is awkward, unnecessary bottlenecks and delays can occur. This tool involves the following multiple traffic management techniques, which can often be used in combination:

- One-way roads and reversible lanes (may shift direction during certain periods of the day),
- Restricted left turns,
- Roadway or parking area closures,
- Changes in wayfinding,
- Median barriers,
- Offset intersections, and
- Dedicated turn lanes and tour bus staging areas.

Most of these techniques can be piloted to assess effectiveness, tradeoffs, and feedback from visitors and partners. Another option is to change the flow of traffic only during busy times using temporary barriers or similar methods, and then remove the barriers seasonally or daily.

## CATEGORY: Roadway



### Factors That Could Increase Cost and Time

The total capital cost for this tool is typically less than \$50,000. The time required for implementation is one to three years.

Factors that could increase cost and time:

- Traffic circulation changes requiring capital investment, such as roundabouts, which typically start with a planning study and simulation analysis to collect and analyze circulation patterns.
- Extensive scope and scale of the changes or need for extensive data collection.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

Long-term costs for this tool do not vary from operation of traditional roads. Exception would be the cost of staff time for moving barriers along a reversible lane road, installing/removing temporary parking area closures, or reprogramming dynamic/variable messaging signs.

### Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- NPS *Management Policies 2006*, Chapter 9
- DO 87A: *Park Roads and Parkways*



# Traffic Circulation Changes

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	○	●	●	●	-	●

### PROS

- One-way and reversible lanes can increase throughput without building more roads.
- Safety may be improved, as one-way roads reduce potential traffic conflicts (such as traffic moving in the opposite direction).
- The implementation of temporary or permanent one-way lanes may provide an opportunity to promote alternative modes, such as cycling, along a roadway. There may be enough lane width to create a bicycle lane when traffic is converted to one-way (versus two-way).

### CONS

- Changing the traffic circulation on one roadway to decrease congestion can move/ shift the congestion to other roadways in the area if the roads are not viewed as an entire network.
- If a visitor misses a particular attraction on a one-way road/loop, they may not have time to traverse the entire route again to return to the attraction. If the attraction is popular, they may circle back, possibly increasing roadway congestion, or may try to perform illegal or unsafe maneuvers to try and get back to the site more quickly. Making sure the area is properly signed and informing the visitors ahead of time to pay attention if they want to see that site would reduce the possibility of these things happening.

### COORDINATION / PARTNERSHIPS

The park should check ownership of roads during the exploration of these tools. Coordination may be needed with the gateway community, as well as with the entity that owns and operates the road or road network outside the park, such as the local and/or state departments of transportation.

### ADDITIONAL CONSIDERATIONS

Traffic circulation changes that are only done for portions of the day or season, such as reversible lanes, can be complicated to implement. Adequate information must be provided in advance to visitor so that they are aware of the changes during the affected time periods. Using dynamic message signs (see *Dynamic/Variable Message Signs* tool) can facilitate visitor awareness of the circulation changes.

Changes to traffic circulation must be coordinated with updated emergency access plans to ensure emergency vehicles maintain access to all areas of the park.

### ADDITIONAL RESOURCES

- 2020 Rock Creek Parkway uses reversible lanes during weekday peak hours <https://www.nps.gov/rocr/index.htm>
- 2017 Yosemite National Park Implements Road and Campground Improvements <https://www.nps.gov/yose/learn/news/yosemite-national-park-implements-road-and-campground-improvements.htm>
- 2017 Traffic Calming ePrimer [https://safety.fhwa.dot.gov/speedmgt/traffic\\_calm.cfm](https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm)

# Improve Existing Transit Services



Improving transit services can improve efficiency and add capacity of the existing system. Methods include:

- new or expanded multimodal facilities (bus shelters, additional stops, bicycle and pedestrian connections),
- reserved travel lanes for transit,
- transit technology applications, such as computer aided dispatch and automated vehicle location,
- real-time bus arrival information displays,
- more buses and/or additional routes,
- transit signal prioritization, and
- combination of above.

When determining how to improve existing transit service, the park should have a clear evaluation of the problems with the existing system, impacts to visitor experience and resources, potential tradeoffs (for example, if visitor capacity is a concern, adding transit services may exacerbate the issue), and an updated transit pro forma to understand financial risks.

Above: Bus only lane, Muir Woods National Monument. Photo credit: Heather Richardson, US DOT Volpe Center

## CATEGORY: Transit/Shuttle/Tours



### Factors That Could Increase Cost and Time

Implementation of this tool generally costs less than \$50,000 and takes one to three years to complete.

Factors that could increase cost and time:

- A transit improvement study typically costs more than \$100,000 and requires at least a year of data collection and analysis. Incorporating the annual transit pro forma into the study process will help parks understand if they would need to adjust their fee structure to modify transit system operations. This should be coordinated with the Recreation Fee Program.
- Adding capacity to the system may require increasing the fleet size, which requires regional and WASO approval prior to the procurement process. Vehicle manufacturers may also have a long lead time before the buses are delivered.
- Expanding or adding a multimodal facility.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term costs improve existing transit services vary. Common items can include repaving and restriping transit lanes; replacement of worn or damaged signage, bus shelters and other infrastructure; vehicle maintenance; fuel/oil; insurance; software/equipment upgrades; and utilities. Service contracts may be needed for maintaining specialized electronic equipment.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- NPS *Management Policies 2006*, Chapter 9
- DO 87A: *Park Roads and Parkways*

# Improve Existing Transit Services

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	○	-	●	-	●

Piloting changes to transit operations, such as different routing or more frequent service, can provide good insight into whether the changes will improve the efficiency of the system. Piloting changes should include some level of collecting information about the results to help quantify the impacts, especially those that require substantial investment for permanent implementation.

Expansion of transit systems will require regional and WASO approvals; parks should engage with their regional transportation coordinator before considering changes to an existing transit system.

A park may consider changes to its entrance fee or adding a transportation fee to help cover the costs of improving transit service. Any changes to a park's fee structure must be coordinated with the regional and WASO Recreation Fee Program. Note that a transportation fee is deducted from the park's entrance fee, not in addition to it, and is entirely for park use on transportation costs.

### PROS

- Encourages more transit use.
- Reduces greenhouse gas emissions by getting more people to use transit instead of personal vehicles.
- Provides greater understanding and control over how the system operates and allows for operational efficiencies using transit technology applications.

### CONS

- Increases in capacity and ridership can lead to pulsing, the over use of resources adjacent to shuttle stops, and crowding on popular trails and attractions.
- Increases the operation and maintenance costs for the system because of regular software and hardware upgrades of transit technology applications and associated staff time.
- Creates sound and visual disturbances in some park settings by adding additional vehicles or aboveground transit infrastructure.
- Increases in shuttle demand could result in increased demand for new parking areas to access the shuttle.
- Increases the footprint of the transportation corridor and impacts to cultural or natural resources by adding travel lanes or expanding multimodal facilities.

### COORDINATION / PARTNERSHIPS

There are many options available for improving an existing transit system. As a result, this tool requires involvement of NPS transportation offices, and may require coordination with the gateway community, local transit agency, concessioner(s), traffic engineers, and local jurisdiction that owns and operates the roadway (if the road is non-NPS owned).

### ADDITIONAL CONSIDERATIONS

A transit operations study can help determine how changes to the existing system services may impact cultural and natural resources, visitor experience, and congestion in other areas of the park or gateway community.

To gauge the effectiveness of making improvements to existing transit services, collecting data on the following performance measures can be helpful: travel time for transit, delays, ridership numbers, and vehicle down time for maintenance.

# Improve Existing Transit Services

## Implementation Considerations, cont.

### ADDITIONAL RESOURCES

- 2017 Eisenhower National Historic Site Visitor Transportation and Access Study <https://rosap.ntl.bts.gov/view/dot/32580>
- 2020 Acadia National Park implemented a multi-agency, intermodal center. Park also has a two-way voice communications on the Island Explorer including: automated vehicle location, arrival sign systems, and a traveler information system. <https://parkplanning.nps.gov/projectHome.cfm?projectID=12437>
- 2020 Yosemite National Park has a bus only lane on the Southside Drive from El Capitan Drive up to Half Dome Village and the intersection with Northside Drive. The park is able to open and close the lane to general traffic using cones and changeable signs. <https://www.nps.gov/yose>
- 2011 Alternative Transportation System Demand Estimation for Federal Land Management Agencies <https://rosap.ntl.bts.gov/view/dot/9547>

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# Tour Bus Management



Visitation via tour buses reduces the number of private cars on park roads. However, due to their size, parking, and loading/unloading requirements, tour buses can also cause congestion and present unique operational challenges for park staff. Tour bus management strategies include:

- providing large vehicle parking spaces that eliminate the need for drivers to back up,
- designating drop-off areas where passengers can load/unload away from through traffic,
- maintaining pavement to adapt to increased wear and tear,
- reserving tour bus parking spaces with traffic cones and enforcing time limits for idling,
- specifying parking and idling requirements in commercial use authorizations or special event permits,
- directing tour buses to uncrowded locations (see *Variable Messaging Signs*), and
- managing visitor pulsing.

Adding infrastructure, such as “fast pass” (see *Limited Access Only Lanes at Entrances* tool) or reserved travel lanes for tour buses (see *Improve Existing Transit Services* tool) can expedite tour bus movement through the park and promote tour bus parking at locations that link to trails and transit.

Above: Tour bus parking area, Muir Woods National Monument.  
Photo credit: Heather Richardson, US DOT Volpe Center

## CATEGORY: Transit/Shuttle/Tours



### Factors That Could Increase Cost and Time

This tool usually costs less than \$50,000 and can be implemented in less than one year.

Factors that could increase cost and time:

- Expanding parking and changing parking layout.
- Implementing bus lanes.
- Modifying existing facilities such as parking areas, overlooks, and visitor centers.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term operations and maintenance costs include staff time to monitor the impacts of the tool and adapt/retest as needed. These costs may include: data collection and reporting, evaluating recapitalization needs, modifying traffic/parking direction, or updating special event/incident command system plans. The largest operating cost for managing tour buses is staff time for communicating the policies to tour bus operators and enforcing those policies.

### Implementation Considerations

The park’s Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- *NPS Management Policies 2006*, Chapter 9
- *DO 20: Agreements*
- *DO 32: Cooperating Associations*
- *DO 77A: Civic Engagement and Public Involvement*

# Tour Bus Management

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
○	●	●	○	●	-	●	●	●

### PROS

- Accesses less congested areas during peak periods to manage visitor demand by working with tour bus operators.

### CONS

- Causes congestion through overuse of tour buses, especially if they enter areas where large vehicles cannot be accommodated.
- Reduces the number of parking spaces available for private vehicles when parking areas are modified to accommodate larger tour bus vehicles. Care is needed ensure that crowded parking areas can be safely maneuvered by oversized vehicles.
- Creates a pulsing of visitors that could affect carrying capacity of visitor attractions and amenities.

### COORDINATION / PARTNERSHIPS

Introducing or changing policies that establish where, when, and how long tour buses can access a park would benefit from input from tour bus companies and visitors upfront to identify problems and where/when they occur. The park should also consider partnering with the gateway community to ensure that tour buses are not adding to congestion in gateway communities.

### ADDITIONAL CONSIDERATIONS

- Tour buses require Commercial Use Permits to operate within a park.
- Provide designated tour bus staging/idling locations outside visitor parking areas to minimize noise and air quality concerns.
- Related tools are *Parking Management* and *Parking Supply*.

### ADDITIONAL RESOURCES

- 2020 Denali National Park and Preserve Bus Tours <https://www.nps.gov/dena/planyourvisit/bus-tours.htm>
- 2020 Acadia National Park Guided Tours <http://www.nps.gov/acad/planyourvisit/guidedtours.htm>
- 2019 Acadia National Park Bus & Motor Coach Rules <https://www.nps.gov/acad/planyourvisit/buscoachrules.htm>
- 2017 Yosemite Valley Bus Parking Rules <https://www.nps.gov/yose/planyourvisit/upload/busparking.pdf>
- 2020 NPS Commercial Use Authorizations <https://www.nps.gov/aboutus/commercial-use-authorizations.htm>
- 2015 National Mall and Memorial Parks Tour Bus Study [https://www.nps.gov/nationalmallplan/Documents/Trans/NationalMall\\_TourBusStudy\\_FinalReport\\_June%202015.pdf](https://www.nps.gov/nationalmallplan/Documents/Trans/NationalMall_TourBusStudy_FinalReport_June%202015.pdf)

# Transit/Shuttle Services



Transit or shuttle services reduce congestion by enabling visitors to travel to and/or around the park without a private vehicle. Some transit services originate outside of the park, bringing visitors to or past the entrance station. Other systems may operate entirely within the park boundary.

Services that start outside the park can reduce entrance station congestion. Services that drop visitors before the entrance, or only run internal to the park, do not reduce entrance station congestion—although they may reduce road or parking congestion. Regardless of the system design, parking for passengers will be required where transit services start and end.

A shuttle service changes visitor use patterns, increasing demand at transit stops where parking is available (trailheads and key sites). This may mean a bigger demand for parking and large pulses of visitation as visitors get on or off the shuttle.

Parks considering a shuttle service should start with a feasibility study. The study should look at existing visitation and congestion patterns, frequency and duration of the congested periods, parking options, potential partnerships, operating arrangements (park owned, service contract, or concession), and both capital and operational costs. Parks should also look to peer parks with transit services for lessons learned. Piloting a shuttle service is strongly encouraged to evaluate how well a system mitigates congestion, potential unintended impacts, costs, and other challenges.

## CATEGORY: Transit/Shuttle/Tours



## Factors That Increase Cost and Time

Implementation of this tool is more than \$250,000 and takes three to six years to complete.

Factors that could increase cost and time:

- Requirements to launch a transit system include: conducting a transit feasibility study; securing approval from regional office and WASO; and operating a pilot program (including marketing).
- If the pilot is successful, the park must create a financial pro forma and funding plan; secure funding for buses and visitor facilities; purchase or lease buses; build/install visitor facilities; select a business model, create schedules and routes; and market the service.
- Infrastructure to support service within the park can include bus stop amenities (shelters, benches, bus stop signs, sidewalks, etc.), and facilities for storing and/or maintaining the buses.
- Parking facilities for shuttle riders should must also be considered, see the *Parking Supply* tool.

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include: labor costs; insurance; fuel costs; repairs and replacement costs for vehicles; recapitalization costs; utility costs for shelters and maintenance facilities; marketing; and repair and upkeep costs for facilities. The location of the park will impact operating costs—rural parks without fuel, and maintenance and storage facilities on-site will accrue additional labor and fuel charges to drive the vehicles long distances for fuel and storage.



# Transit/Shuttle Services

## Implementation Considerations, cont.

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

### Specific pre-implementation issues for use of this tool include:

- NPS *Management Policies 2006*, Chapters 1, 2, and 9
- DO 20: *Agreements*
- DO 32: *Cooperating Associations*
- DO 77A: *Civic Engagement and Public Involvement*

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	-	○	-	●	-	●

A park may consider changes to its entrance fee or adding a transportation fee to help cover the costs of a shuttle system. Any changes to a park's fee structure must be coordinated with the regional and WASO Recreation Fee Program. Note that a transportation fee is deducted from the park's entrance fee, not in addition to it, and is entirely for park use on transportation costs.

### PROS

- Increases the occupancy (number of visitors) per vehicle to help decrease congestion by removing personal vehicles from roadways.
- Decreases environmental impacts.
- Allows visitors to arrive via public transportation because there is an option to continue travel within a park.
- Alleviates traffic congestion and opens the roadway to bicycles and pedestrians through mandatory shuttle services, even if only on weekends.

### CONS

- Adds additional people at a destination that is already at capacity. This includes overall as well as intense pulses of many visitors arriving at the same time.
- Affects the efficiency and effectiveness of the service if stuck in this same traffic congestion it is trying to prevent.
- Expensive to operate and maintain annually and recapitalize vehicles.
- Transfers may be necessary if one service provides access only as far as the entrance and another operates within the park.
- Does not reduce parking demand unless visitors can easily get to the park via bus, bike, rail, etc.

# Transit/Shuttle Services

## Implementation Considerations, cont.

### COORDINATION / PARTNERSHIPS

Transit/shuttle services are complex operations requiring a significant amount of coordination. Coordination can be required well beyond the park boundary and gateway community, and involve NPS transportation offices, local transit agencies, regional Federal Lands Highway office, regional Federal Transit Administration office, other land management agencies, and/or the state. Coordination will also be needed with owners of potential bus stop and park and ride locations outside the park. Depending on the business model, partnerships may be necessary with a local friends group, transit provider, and others.

### ADDITIONAL CONSIDERATIONS

- Providing transit can expand visitation, a study can help the park be prepared for changes in parking demand, trail use, etc.
- Selected fleet vehicles must be appropriate for the park's location and conditions (e.g., passenger capacity, fuel type, steep terrain, bridge clearances, turning radii, location/access to maintenance and fueling facilities, and temperatures).
- Promotion of new shuttle services is critical to building ridership (see *No-Car Access Options* tool). This includes a signage plan and information on the park webpage, etc.

To gauge the effectiveness of implementing transit/shuttle service, data on the following performance measures can be collected and analyzed: decreasing private automobile volumes at trailheads and parking areas and ridership numbers.

### ADDITIONAL RESOURCES

- 2020 Devils Postpile National Monument has a mandatory shuttle system  
<https://www.nps.gov/depo/planyourvisit/reds-meadow-and-devils-postpile-shuttle-information.htm>
- 2016 NPS National Transit Inventory and Performance Report  
<https://rosap.ntl.bts.gov/view/dot/34400>
- 2012 Arches National Park Transit Feasibility Study, Volumes 1-3,  
<https://parkplanning.nps.gov/document.cfm?parkID=25&projectID=34626&documentID=47885>



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# Dynamic/Variable Message Sign



Dynamic/variable message signs (VMS) provide en route and on-site information to visitors about a variety of topics, including advanced notification of congestion at entrance stations or parking areas, road closures, hazardous conditions, construction, and suggestions about where to find uncongested areas. They are increasingly deployed by parks managing congestion on a seasonal basis to alert visitors to parking, entrance station, and trail congestion.

VMS are relatively small, trailer-mounted devices that can be deployed to multiple locations as either stand-alone devices or a part of an integrated, staged system of messages. The devices are typically solar powered and either cell phone or satellite enabled. They are lower in cost than permanent signs and can either be purchased or rented (from construction companies, state DOTs, or local partners). VMS offer parks flexibility to change messages and rotate deployment locations depending on seasonal crowding conditions. Sample congestion and related messages might include:

- Overlook Parking Full, Park @ Overlook 2
- Entrance Station Wait Time: 20 Mins
- No Road Side Parking Enforced
- Historic Area Closed Until 4 p.m.
- Avoid Congested Road, Turn Right at Sign
- Three Wildflower Parking Locations Ahead

For permanent VMS, see Intelligent Transportation Systems.

Above: Variable message sign, Grand Teton National Park.  
Photo credit: Amalia Holub, NPS

## CATEGORY: Visitor Information



### Factors That Increase Cost and Time

The typical cost of this tool is less than \$50,000, and its implementation time is less than one year.

- Installing permanent signs.
- Purchasing signs versus renting them.
- Placing signs on non-NPS property, which could require permitting.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for VMS include staff time for training and updating the sign messaging, utilities such as electricity, technology repair/replacement parts, and storage and transportation (portable sign). While a rented portable sign may include service, there is often a separate delivery fee and staff time is still required to update the signage messaging and managing the rental agreement.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- 470 DM 2 - Digital Media Policy
- Policy Memorandum 11-02 - Social Media - Interim Policy
- Consider turning off at night to reduce light pollution

# Dynamic/Variable Message Signs

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	-	●	●	●	-	○

### PROS

- Visitors can make better-informed decisions about potential travel delay, locations to avoid, opportunities for transit or trail experiences, and information about special events.
- Portable signs can be deployed during specific times of day, week, or season, limiting the impact of the viewshed.

### CONS

- Limited cellular coverage will require that the VMS (1) only be located in areas of service, (2) be manually updated by NPS staff who would need to drive to the sign for every update, or (3) be equipped with satellite communications or radio relay.
- Only a small amount of information can be displayed on a portable VMS.
- Locating a rental company for a portable VMS may be harder in rural areas than urban areas. This may also increase the rental cost in a rural area due to demand as well as increase the delivery charges due to distance travelled for delivery. In these areas, parks may be able to rent VMS signs from state DOTs or municipalities and/or local contractors.
- Partnering to utilize permanent non-NPS VMS may not be an option if this infrastructure does not exist near a park.

### COORDINATION / PARTNERSHIPS

If the portable VMS is desired on a non-park road, permits will likely be required either from the city/town, county, or the state Department of Transportation. In some cases, the state DOT may allow the park to borrow a portable VMS for a short amount of time.

For permanent VMS on a state highway, close coordination with the local jurisdictions and/or state DOT will be required to approve messaging, display the messaging at appropriate times when using an existing VMS, and approve applications for new VMS structures.

### ADDITIONAL CONSIDERATIONS

- Information on the VMS board must be accurate, timely, reliable, targeted toward visitor needs and updated regularly (daily or weekly depending on circumstances).
- For VMS portable signs, recommend using only two frames (each frame equals three lines with generally 8-10 characters per line).
- Signs should be located well in advance of a junction and where they can be clearly seen (avoid heavy vegetation or blind curves).
- The messages and sign placement should follow requirements in the Manual of Uniform Traffic Control Devices (NPS can obtain a waiver if needed).
- Contact the regional FLTP Coordinator to ask whether a portable VMS is available from other parks or could be leased from FHWA or state Department of Transportation.

# Dynamic/Variable Message Signs

## Implementation Considerations, cont.

### ADDITIONAL RESOURCES

- 2020 Joshua Tree National Park has rented VMS signs and placed them on Route 62 outside the park <https://www.nps.gov/jotr/index.htm>
- 2020 Great Sand Dunes National Park and Preserve has used VMS for special events <https://www.nps.gov/grsa/index.htm>
- 2020 Montezuma Castle National Monument uses VMS to inform visitors of crowded conditions <https://www.nps.gov/moca/index.htm>
- 2020 Gateway National Recreational Area utilizes VMS and innovative trip planning tools <https://www.nps.gov/gate/index.htm>
- 2020 Gettysburg National Military Park uses a VMS to advise of parking availability <https://www.nps.gov/gett/index.htm>
- 2011 Rocky Mountain National Park Dynamic Message Sign/Highway Advisory Radio Operations Plan <https://rosap.nrl.bts.gov/view/dot/29322>
- 2019 Manual on Uniform Traffic Control Devices for Streets and Highways (Chapter 2L: Changeable Message Signs) <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part2ithu2n.pdf>

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# Intelligent Transportation System (ITS)



Intelligent Transportation Systems (ITS) are a suite of integrated communication and transportation technologies. Some ITS are embedded in infrastructure (roads, electronic signs, etc.) and some are within personal vehicles or cell phones, such as:

- Variable message signs (VMS) (portable and fixed),
- Park social media and websites,
- Applications or alerts on smart phones, and
- Infrastructure in parking lots or roadways.

Benefits for visitors include:

- Travel and traffic conditions and delays,
- Transit arrival/departure,
- Hazardous condition warnings and incident management, and
- Construction management/delays.

ITS can be scaled from small portable VMS signs (see *Dynamic/Variable Message Signs* tool) to complex traffic/parking sensors, data collection equipment, and fixed electronic signs. Implementation issues include use of a contractor to conduct software and hardware updates, and reliable electrical and cellular connectivity.

This is a rapidly changing technology. Where congestion occurs on a regular, predictable basis, forecasting via traffic data models may be a better investment.

## CATEGORY: Visitor Information



## Factors That Could Increase Cost and Time

The typical cost of this tool is less than \$50,000, and its time to implementation is generally less than one year.

Factors that could increase cost and time:

- Installing complicated ITS equipment, such as parking occupancy or next bus arrival displays, which may require the procurement, installation, and operation of ITS components, including supporting software and communication networks.
- A high number of locations where the ITS is deployed.
- The need to establish data communication functionality (e.g., cellular, radio).

## OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term costs of operations and maintenance of ITS involves software updates, utilities such as electricity, equipment, and upgrades as software systems are improved.

## Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- 470 DM 2 - Digital Media Policy
- Policy Memorandum 11-02 - Social Media - Interim Policy
- Consider turning lighted signs off at night to reduce light pollution



# Intelligent Transportation System (ITS)

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	●	○	●	-	○

### PROS

- Improves efficiency and safety by supporting the management of a park’s transportation network.
- Improves visitor experience by providing real-time information.
- Provides information on how visitors react to park messaging, congestion, and weather.

### CONS

- Requires constant upgrades to ITS equipment due to rapidly changing operating systems and software.
- Requires consideration for appropriateness in historic settings and cultural landscapes since ITS signs are lighted and can be large.
- Requires reliable power source(s) and communication network(s) to be established if not already available.

### COORDINATION / PARTNERSHIPS

Parks could consider coordinating with neighboring municipalities, other state or federal government agencies, or other organizations to obtain relevant data that could yield additional information when combined with data collected by the park. This includes coordinating with entities owning existing variable message signs on highways leading to parks.

### ADDITIONAL CONSIDERATIONS

ITS technology is changing rapidly, so consider the long-term viability of this investment. ITS for parking area management is a unique system architecture. The regional FLTP Coordinator should be engaged in the planning process for large capital ITS projects.

Related tools in the Toolkit include: *Dynamic/Variable Message Signs, Data Collection and Analysis, On-Site Visitor Congestion Information, and Pre-arrival Visitor Congestion Information.*

### ADDITIONAL RESOURCES

- 2020 Rocky Mountain National Park’s Bear Lake Corridor and webcams, including two at Beaver Meadows and Fall River entrances <https://www.nps.gov/romo/index.htm>
- 2020 Acadia’s Island Explorer buses are tracked by satellite and mapped in real time on the website for visitor information <http://www.exploreacadia.com/>
- 2011 Intelligent Transportation Systems in the National Parks System and Other Federal Public Lands [https://www.nps.gov/orgs/1548/upload/ITS\\_In\\_Parks\\_2011\\_Update.pdf](https://www.nps.gov/orgs/1548/upload/ITS_In_Parks_2011_Update.pdf)
- 2018 Reducing Congestion in Rocky Mountain National Park’s Bear Lake Corridor <https://www.nps.gov/articles/its-in-rocky-mountain-national-park.htm>

# On-Site Visitor Congestion Information

West Side Weather			Logan Pass Weather			East Side Weather		
Today 69°F 45°F		Showers T-Storms	Today 50°F 42°F		Showers T-Storms	Today 62°F 43°F		Showers T-Storms Likely
Saturday 71°F 48°F		Mostly Sunny	Saturday 51°F 45°F		Partly Sunny	Saturday 64°F 44°F		Mostly Sunny
Sunday 78°F 45°F		Sunny	Sunday 58°F 45°F		Sunny	Sunday 72°F 44°F		Mostly Sunny

St. Mary Campground is hard-sided only • Be prepared for changing conditions • Stay hydrated •

Congestion	P Parking Status								Vehicle Access Restrictions		
	Apgar VC	Avalanche Creek	Bowman Lake	Kintla Lake	Logan Pass	Many Glacier	St. Mary VC	Two Medicine	Many Glacier	North Fork	
Current Status	No Report	Full	No Report	No Report	Full	No Report	No Report	No Report	None	None	
Filled Yesterday		10:16 am	11:10 am	11:53 am	08:15 am	12:24 pm	12:40 pm				

The park's ability to communicate real-time visitor congestion information on-site is a valuable tool for managing congestion and helping visitors make their own choices about where they will visit. Visitor centers and entrance stations are important first points of contact to convey information about crowding conditions (and less crowded areas), travel times, closures, parking, and transit options, along with how visitors can stay informed of these issues during their visit. A simple and inexpensive way to help manage congestion is to take advantage of the existing visitor center or other visitor contact points. Information may be conveyed in the form of print material like a simple handout or map or electronic communication such as interactive touch screen kiosks at visitor centers or dynamic message signs. Communication of visitor congestion information may also be integrated into other key locations of the park such as campgrounds and lodges.

## CATEGORY: Visitor Information



### Factors That Could Increase Cost and Time

The typical cost for this tool is less than \$50,000, and the general time to implementation is less than one year.

Factors that could increase cost and time:

- The need to collect data about on-site visitor congestion.
- The level of complication of the techniques that are implemented.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include staff time to train new staff, keep materials updated, printing of current materials, utilities such as electricity, software updates, technology repairs, and replacement parts.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- 470 DM 2 - Digital Media Policy
- Policy Memorandum 11-02 - Social Media - Interim Policy
- Consider turning lighted signs off at night to reduce light pollution

# On-Site Visitor Congestion Information

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
○	-	●	●	●	-	●	●	○

### PROS

- Providing visitors with targeted congestion information can help inform their travel decisions and manage expectations about crowding.
- Providing visitors with options, such as alternative locations, modes, and routes as well as congestion information, can help them in adjusting their travel plans.
- Ensuring that the signage, web applications, print materials, and staff provide a consistent message will help visitors feel that the information is timely and accurate.

### CONS

- Visitor centers (and a park marketing materials) tend to highlight a park's most popular destinations, which can lead to congestion at those locations.
- Promoting less congested locations may increase crowds in areas not equipped to handle higher levels of visitation.
- Maintenance of ITS systems and infrastructure may need to be outsourced if park staff are unfamiliar with the technology.
- Providing too much information at the entrance stations can increase visitor contact time and therefore increase entrance station lines.
- Real-time updates via websites and apps may have limited usefulness in parks with limited or no cell service.

### COORDINATION / PARTNERSHIPS

Coordination will be necessary with the park's interpretive and public affairs staff to create new signage and consistent messaging.

### ADDITIONAL CONSIDERATIONS

This tool may also work well with *Dynamic/Variable Message Signs*, *Manage Visitor Use Patterns*, *Pre-Arrival Visitor Congestion Information*, and *Visitor Use Management* tools.

Parks that are considering developing a smartphone application should talk with their regional IT staff about feasibility and whether the endeavor is worthwhile.

### ADDITIONAL RESOURCES

- 2020 Arches National Park and partners distribute information to visitors about when specific sites/attractions are most congested and the best times to visit <https://www.nps.gov/arch/index.htm>
- 2020 Zion National Park uses existing visitor centers to orient visitors to the shuttle system, directing visitors where to park and access the system <https://www.nps.gov/zion/index.htm>
- 2000 Planning for interpretive media, and Interpretive planning <https://www.nps.gov/subjects/hfc/upload/cip-guideline.pdf>
- 2020 Interpretive Planning <https://home.nps.gov/subjects/hfc/interpretive-planning.htm>
- 2020 The Center for Interpretive Media <https://www.nps.gov/subjects/hfc/index.htm>

# Pre-Arrival Congestion Information

Approaching Arch Rock Entrance,  
Highway 140:  
2-hour delay on weekends



Providing visitors with congestion information prior to their arrival at the park is a way to improve visitor experience and influence visitor use patterns to reduce congestion. Pre-arrival information on transportation conditions (availability of parking, crowding at the visitor center, etc.) allows travelers to better plan their visit to a park so they can adjust the time they arrive or change which locations they visit within the park. It is also a way to manage visitor expectations regarding levels of congestion, which can improve the overall visitor experience.

Pre-arrival congestion information can be provided in a variety of ways, including park and travel (TripAdvisor) websites, webcams, social media, smartphone applications, information at nearby hotels and visitor centers in gateway communities, and dynamic variable message signs en route to the park. Based on past visitation trends and other data collected, travel forecasts can be developed for a year or a busy season to provide visitors more accurate information. Real-time information can be collected using Intelligent Transportation Systems and then distributed electronically to the public (see *Intelligent Transportation Systems* tool). For instance, a park may use ITS to monitor parking area capacity and inform visitors a specific parking area is full before they arrive and redirect them to another that is open. General information (such as the parking at the overlook is generally full by 9:00AM) can also be useful for visitors.

## CATEGORY: Visitor Information



### Factors That Could Increase Cost and Time

The typical cost for this tool is less than \$50,000, and the usual time to implement it is less than one year.

Factors that could increase cost and time:

- Only limited infrastructure already in place.
- Collecting more data on congestion trends and/or real-time congestion information.
- Using webcams and creating an Intelligent Transportation System.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include staff time to train new staff, keep websites and social media accounts updated, and coordinate amongst staff on upcoming events to post, software updates, and potentially technology repairs.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

Specific pre-implementation issues for use of this tool include:

- 470 DM 2 - Digital Media Policy
- DO-77A: *Civic Engagement and Public Involvement*
- Policy Memorandum 11-02 - Social Media - Interim Policy

# Pre-Arrival Congestion Information

## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	●	●	●	●	○

### PROS

- Relatively inexpensive tools, such as social media, can have a positive impact on many visitors.
- Providing visitors with targeted information can help inform their travel decisions before they arrive and manage expectations.
- More visitors might come to the park because the real-time visitor information makes them feel more in control of their experience.
- Visitors that adjust their travel plans to avoid congestion reduce the congestion level of the park overall, which improves visitor experience.

### COORDINATION / PARTNERSHIPS

Parks may want to coordinate changes in messaging with local partners. For instance, local shops and restaurants may lose business if visitors move through the community before shops are open in order to avoid congestion in the park. If the park uses hard copy information in the gateway community, they will need to coordinate regular updates.

### CONS

- Maintaining real-time updates on social media outlets can be time consuming for staff.
- The park may be fuller earlier and later with little change in the levels of visitation at peak times, making the park busier overall and impacting staff and natural resources.
- Local partners might not be willing to assist the park in distributing information.
- Attempting to provide real-time information could raise visitor expectations and result in an increased number of complaints fielded by the park if conditions at the park are not what visitors were told to expect.

### ADDITIONAL CONSIDERATIONS

The NPS National Long Range Transportation Plan (2017) identifies elements of essential traveler information: 1) driving directions, 2) public transportation, 3) accessibility, 4) description of the experience, 5) travel distances and time, 6) bicycle/ pedestrian access, 7) parking area locations and peak use, 8) presence or lack of congestion, and 9) alternative fueling stations. <https://rosap.ntl.bts.gov/>

Pre-arrival information must consider both the preferred behavior and potential spillover impacts in the entire park. For instance, encouraging visitation to less congested areas may shift crowding to new areas. Using multiple strategies to relay congestion information to visitors may help.

Automated collection of data on congestion and/or real-time congestion information could improve the quality of pre-arrival congestion information. See *Data Collection and Analysis* and *Intelligent Transportation Systems* tools.

# Pre-Arrival Congestion Information

## Implementation Considerations, cont.

### ADDITIONAL RESOURCES

- 2020 Yosemite advises visitors to Yosemite Valley to expect congestion and arrive before 9:00am <https://www.nps.gov/yose/index.htm>
- 2020 Glacier National Park has a real time Recreation Access Display trip planning tool <https://www.nps.gov/applications/glac/dashboard/>
- 2020 Yosemite Valley Plan Your Trip <https://www.nps.gov/yose/planyourvisit/yv.htm>
- 2020 Grand Canyon National Park webcams <https://www.nps.gov/grca/learn/photosmultimedia/webcams.htm>
- 2020 Grand Canyon National Park Parking – South Rim [https://www.nps.gov/grca/planyourvisit/parking\\_sr.htm](https://www.nps.gov/grca/planyourvisit/parking_sr.htm)
- 2020 South Rim Crowding: A Survival Guide <https://www.nps.gov/grca/planyourvisit/sr-tips.htm>
- 2020 Arches National Park Traffic & Travel Tips <https://www.nps.gov/arch/planyourvisit/traffic.htm>
- 2017 National Parks Service National Long Range Transportation Plan [https://rosap.nsl.bts.gov/view/dot/32531/dot\\_32531\\_DS1.pdf](https://rosap.nsl.bts.gov/view/dot/32531/dot_32531_DS1.pdf)



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# Signage and Wayfinding



Signage and wayfinding techniques provide guidance to destinations and experiences. They aid congestion relief by allowing visitors to understand where attractions are and how to get there. Signage and wayfinding can be static, dynamic, or both (see *Dynamic/Variable Message Signs* and *Manage Visitor Use Patterns* tools), and can be used in conjunction with social media messaging (see *On-Site Visitor Congestion Information* and *Pre-Arrival Visitor Congestion Information* tools) and dashboard GPS readouts.

Effective signage and wayfinding reduces congestion by improving the flow of traffic and distributing visitors to their destinations more efficiently. Improvements to signage and wayfinding can be handled at the site level or parkwide, depending on the park's goals.

Above: Transit map, Bryce Canyon National Park.  
Photo credit: NPS

## CATEGORY: Visitor Information



### Factors That Could Increase Cost and Time

The typical cost of this tool is less than \$50,000, and the time required for implementation is less than one year.

Factors that could increase cost and time:

- Extensive scale and scope.
- High level of complexity of signing and wayfinding systems.

### OPERATION AND MAINTENANCE LONG-TERM COSTS

The long-term cost implications for this tool include replacement of signage that no longer meets signage reflectivity guidance, has been damaged or defaced, or has outdated or inaccurate information.

Operational costs may also include ongoing visitor surveys to ensure that the signage and wayfinding is continually effective.

### Implementation Considerations

The park's Interdisciplinary Team and Cultural Resources Management Team should be assembled to assess NEPA, Section 106, and other regulatory requirements prior to using this tool.

**Specific pre-implementation issues for use of this tool include:**

- DO 77A: *Civic Engagement and Public Involvement*
- Consult with Harper's Ferry Center



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## Implementation Considerations, cont.

PROBLEM AREAS ADDRESSED						NPS MANAGEMENT ISSUES		
PARKING AREA CONGESTION	ENTRANCE STATION CONGESTION	ROADWAY CONGESTION	TRANSIT / TRAIL CONGESTION	VEHICLE/ ROADWAY SAFETY	BICYCLE/ PEDESTRIAN SAFETY	IMPROVES VISITOR EXPERIENCE	IMPROVES RESOURCE CONDITIONS	CONTACT REGIONAL FLTP COORDINATOR
●	●	●	●	●	●	●	●	-

### PROS

- Enhances the visitor experience and helps provide a sense of security because visitors are more confident of where they are in a park.
- Assists assist with dispersing visitors to different areas of the park.

### CONS

- Needs coordination of multiple types of signage and wayfinding to give a cohesive look and message and to avoid “visual clutter.”

### COORDINATION / PARTNERSHIPS

Adding signage and wayfinding in a park requires consultation and coordination with park staff. If signs are needed outside park boundaries, consult the agency that manages the roadway where the sign may be placed (town, city, county, etc.) for appropriate process and needs.

### ADDITIONAL CONSIDERATIONS

- The Harpers Ferry Center can provide assistance and guidelines for signs and wayfinding within the park.
- Consult the park wayfinding plan (if any) and coordinate with interpretive staff.
- To reduce the number/size of congestion traffic signs and improve understandability, consider using universal design (pictures rather than words such as a turning arrow).

### ADDITIONAL RESOURCES

- 2018 Connect Historic Boston (a partnership between NPS and the City of Boston) provides wayfinding to National Park sites and other historic Boston sites <https://www.boston.gov/transportation/connect-historic-boston>
- 2020 The National Mall is improving their wayfinding and pedestrian guides <https://www.nps.gov/nama/index.htm>
- 2020 Cabrillo National Monument is implementing its CABR Comprehensive Sign Plan, which addresses signage for pedestrian and vehicular wayfinding, safety, and universal access <https://www.nps.gov/cabr/index.htm>
- 2014 National Park Service UniGuide Sign Standards <https://segd.org/content/nps-uniguide-program>
- 2009 National Park Service Visitor Information Sign System <https://www.nps.gov/subjects/hfc/upload/Wayside-Guide-First-Edition.pdf>
- 2000 Director’s Order 52C: *Park Signs* <https://www.nps.gov/policy/DOrders/DO-52Cdraft.doc>
- 2020 Harper’s Ferry Center <https://www.nps.gov/subjects/hfc/index.htm>

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## **NATIONAL PARK SERVICE:**

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## **DEPARTMENT OF TRANSPORTATION**

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