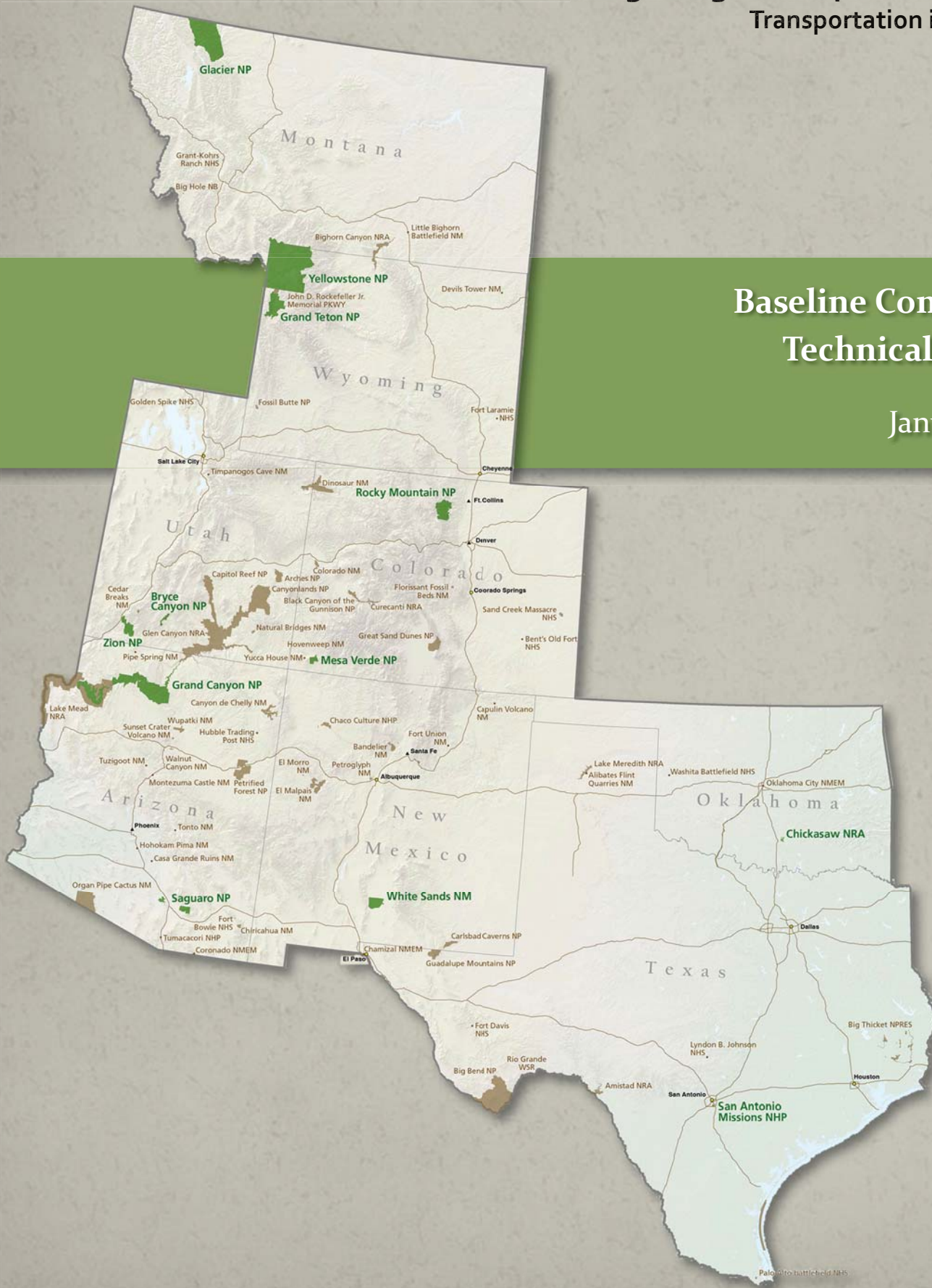




## Long Range Transportation Plan Transportation in Context

### Baseline Conditions Technical Report

January 2013



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# Baseline Conditions Technical Report

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## APPENDIX LIST

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**Appendixes are published under separate cover and are available electronically.**

**APPENDIX A - SUMMARY OF FOCUS PARK INTERVIEWS AND SURVEYS: ADDRESSING VISITOR EXPERIENCE, RESOURCE PROTECTION, AND SUSTAINABLE OPERATIONS THROUGH TRANSPORTATION**

**APPENDIX B – ASSET CONDITIONS BY STATE**

**APPENDIX C – METHODS AND SOURCES**

**APPENDIX D – HISTORIC ROADS, BRIDGES, AND TRANSPORTATION ASSETS**

**APPENDIX E – GLOSSARY**





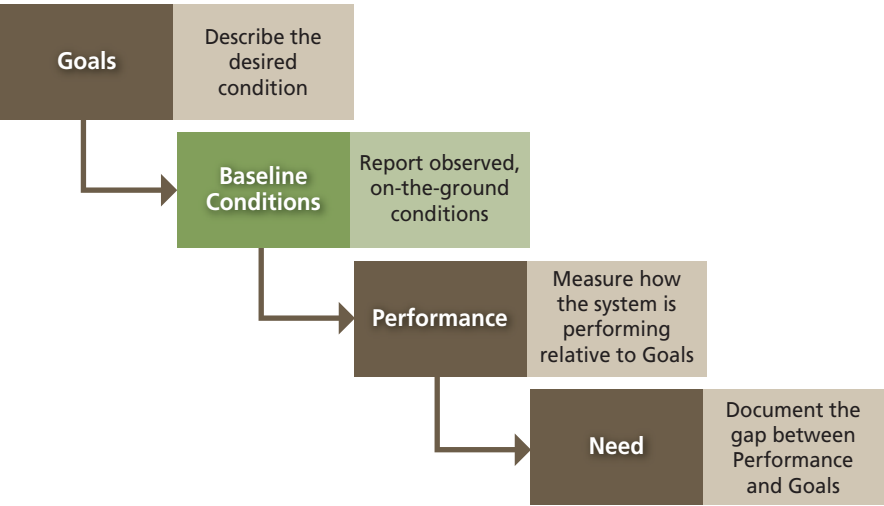
## INTRODUCTION

.....PURPOSE

The Baseline Conditions technical report is a description of the current state of transportation in the Intermountain Region (IMR) using the best available data and other reporting mechanisms. This description of transportation facility conditions, operating characteristics, and programs forms the comparative basis for the upcoming Needs Analysis portion of this Long Range Transportation Plan (LRTP), in which we measure or otherwise identify the difference between observed and desired conditions so as to establish actual needs. This is a transportation inventory, a description of what is at work on the ground today.

The sum of the information collected here forms the basis for future decision making. Other trends only hinted at in the data are further explored in another technical report, *Macro Trends*, which analyzes known and emerging information, projects trends to the future where possible, and draws some assumptions about future conditions and needs.

The Relationship of Baseline Conditions to Goals, Performance, and Need



## ORGANIZATION OF THE REPORT .....

The Baseline Conditions technical report consists of several parts, as described here. Baseline, or current, transportation conditions are described for the IMR as a whole and for each of 12 focus parks, selected for their variety, geography, typology, and relative impact within the region.

**Chapter 1 - Summary of Key Findings and Challenges: The Intermountain Region**  
Transportation System Story provides a high level overview of transportation system characteristics and challenges faced by the IMR.

**Chapter 2 - Intermountain Region Transportation Program Overview** discusses regional organization, processes, and responsibilities.

**Chapter 3 - Intermountain Region Transportation System** provides a detailed account of the full range of conditions for all transportation components in the region.

**Chapter 4 - Transportation System: 12 Focus Parks** provides a detailed account of the full range of conditions for all transportation components in each of 12 focus parks selected for analysis.

**Chapter 5 - Data Gaps** identifies information that was found to be unavailable, inconsistent, or incomplete and that would assist the Intermountain Region in developing the next long range transportation plan update.

Additional background and technical information is included in a series of appendixes published under separate cover:

- **Appendix A** – Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation
- **Appendix B** – Asset Conditions by State
- **Appendix C** – Methods and Sources
- **Appendix D** – Historic Roads, Bridges, and Transportation Assets
- **Appendix E** - Glossary

This technical report follows the framework based on the five goal areas identified at the LRTP Foundation Workshop and are completely described in the LRTP Foundation Technical Report, March 2011.

The overviews at the regional and focus park levels have been designed to be as similar as possible so as to invite comparisons. However, the variety inherent to the IMR and the individual parks, as well as data availability, dictates that some variation in presentation best serves the project. Where park resources, conditions, or importantly, available information, direct us to showcase certain features or programs critical to the description of that park, or of an emerging program, there will be some differences in the presented Baseline Conditions. This report recognizes the priceless diversity represented across the IMR. It also highlights gaps or inconsistencies in data collection and management that limit the aggregation of information at the regional level.

..... **THE PILOT LRTP**

This IMR LRTP is a pilot plan, designed to create a framework for a workable planning process for the region. The plan is expected to accomplish several things:

- Establish the foundation for the long range plan, including goals, objectives, and strategies that form the basis for park unit plans that should be consistent with the IMR LRTP and national guidance.
- Identify current transportation system conditions at the regional level.
- Establish needs region-wide.
- Identify information gaps in knowledge, data, and processes.
- Identify a preferred future scenario for the LRTP.

This pilot plan is intended to serve as a guide for future individual park unit LRTPs, which should be completed as needed. The envisioned update cycle (approximately every five years) will contribute to successively more comprehensive plans as information gaps are filled in.

..... **MEASURING SUCCESS**

The Intermountain Region currently measures success by the successful completion of projects selected through the Servicewide Consolidated Call (SCC) for projects processes which use selection criteria designed to target national goals, and the obligation rate, which was 99% in FY 2010. However, part of this regional LRTP process is to provide performance measures for each of the five goal categories described below. Performance measures will be developed in the Needs and Financial Analysis tasks.

..... **GOALS AND OBJECTIVES FRAMEWORK**

The basic format of the report follows the framework of Goals and Objectives identified at the IMR LRTP Foundation Workshop and are completely described in a previous technical report, *Foundation for the IMR LRTP*. The five goal areas are:

- Asset Management
- Mobility, Access, and Connectivity
- Visitor Experience
- Resource Protection
- Sustainable Operations.

The goals were developed to embrace the full range of transportation characteristics in response to the NPS Mission to attend both to access to the parks and the stewardship of its trust. The Goals and Objectives are consistent with NPS national initiatives, providing a clear sense of direction for the agency at all levels.

## GOAL I. ASSET MANAGEMENT

*Manage transportation assets to maintain primary park roads and visitor transportation systems in acceptable condition.*

### Objectives:

- A. Optimize the investment in existing infrastructure.
- B. Communicate true transportation needs through the effective use of program level performance measures.
- C. Capture total facility costs of construction, operations, and maintenance of existing and planned improvements.
- D. Collect, manage, and maintain appropriate system data to support performance measurement.

## GOAL II. MOBILITY, ACCESS, AND CONNECTIVITY

*Provide a multimodal park transportation system with seamless connections within each park and to surrounding communities where opportunities exist.*

### Objectives:

- A. Reduce the reliance on personal vehicles in order to relieve congestion, reduce resource impacts, and reinforce sustainable practices.
- B. Improve safety at high accident locations such as entrance roads, crosswalks, and parking lots.
- C. Ensure that the transportation system is available and accessible to the broadest diversity of visitors including those with mobility impairments.
- D. Improve intermodal connections to and within the park.

## GOAL III. VISITOR EXPERIENCE

*Support the visitor experience with safe, sustainable transportation and information options that strengthen stewardship and diversity.*

### Objectives:

- A. Reduce congestion where it interferes with the visitor experience or resources.
- B. Integrate state-of-the-art visitor information systems into transportation programs.
- C. Address impacts of non-park traffic on visitor experience.

## GOAL IV. RESOURCE PROTECTION

*Incorporate the ideal of leaving park resources unimpaired into all aspects of transportation including planning, design, construction, maintenance, and operation.*

### Objectives:

- A. Manage visitation and the park transportation system to minimize resource impacts and achieve the desired conditions of park resources.
- B. Consider removing damaging, unnecessary, redundant, or underutilized infrastructure in order to restore resources and minimize maintenance costs.
- C. Use emerging technologies in construction, maintenance, and operations to reduce impacts to park resources.

## GOAL V. SUSTAINABLE OPERATIONS

*Advance IMR transportation programs to promote wise investments and adapt to emerging issues.*

### Objectives:

- A. Utilize the planning process to strengthen effective regional and community relationships.
- B. Promote program and organizational efficiency as sustainable practices.
- C. Identify and incorporate climate change mitigation strategies into all aspects of transportation planning, design, construction, maintenance, and operations.
- D. Provide sustainable and context sensitive solutions to promote energy and resource conservation.

..... • Asset Management

The Asset Management sections of this report document the condition, operations, and performance of the infrastructure required to support park visitation. This includes roadway, parking areas, trails used for transportation purposes, bridges, tunnels, signage, and the deferred costs of maintenance. Deferred maintenance represents the sum of all maintenance that was not performed as scheduled – or needed – and has been subsequently delayed. It does not include annual preventative maintenance, operational costs, or emergency maintenance. Additional costs and funding issues will be explored more thoroughly in future tasks. Deferred, or delayed, maintenance has become one of the biggest concerns of the IMR, as maintenance costs have grown dramatically in recent years, threatening to overwhelm other programs.

The LRTP depends heavily on data collected from multiple sources and for multiple reasons. The extensive data collection and documentation completed in Phase 1 (*Baseline Conditions and Trend Analysis Report for the National Park Service (NPS) IMR, February 2010*) is an integral part of the plan and should be referred to whenever additional detailed information is needed. Since this is a pilot study, and is intended to be repeated and enhanced in future planning cycles, it is important that the data sources be documented to ensure this repeatability.

One component of the effort includes identification of gaps, inconsistencies, or otherwise inadequate resources to collect, store, maintain, and distribute the information required to obtain a full and accurate picture of the IMR transportation system. (Note that this report uses the term “transportation system” in the fully multimodal sense, including roads, transit systems, ferries, aviation, and transportation trails.) The report distinguishes bus or transit modes as Alternative Transportation Systems (ATS).

Each data point highlighted in the report includes a reference to its source. For a complete guide to these references, and the methods used to extract, analyze, and summarize the data, please see Appendix C – Baseline Conditions: Methods and Sources.

..... • Mobility, Access, and Connectivity

The Mobility, Access, and Connectivity section addresses how people move around the parks. The analysis includes vehicle traffic, ATS, commercial tour bus operations, congestion, and safety issues. The section gives an overview of each park’s ATS, if there is one, and its operational characteristics. Intelligent Transportation Systems (ITS) or other technology applications focused on mobility and operations are also illustrated, if present; other advanced communications focused more on visitor information are addressed in the Visitor Experience section.

Access, a multi-level concept, tells us how people get to the park, how convenient it is, and what accessibility issues stem from the Americans with Disabilities Act and Architectural Barriers Act. Connectivity also is important on multiple levels, including connections between modes, i.e., the interface between parking areas, shuttle stops, and trailheads. Just as important is how the park is connected to the region, with transportation infrastructure and with regional partnerships.

## Visitor Experience .....

The Visitor Experience section explores the interrelationship between visitors and transportation. It addresses the components of visitor experience, visitation patterns, including recreational and non-recreational trips, and the types of activities and services used in the park. It also highlights how congestion affects the visitor experience and at what locations. Congestion, whether on roadways, in pedestrian areas, or in proximity to key park features is nearly always reported as a negative effect. Visitors typically desire an unhurried opportunity to enjoy the park’s resources. Many parks have implemented, or plan to implement, other information systems to assist visitors who are planning a trip or navigating the park’s attractions.

In addition to this “system-based” information, the LRTP also highlights some of the activities that make the park experience special. The results of a survey of park managers in July and August of 2011 provide a close up look at how visitors experience the park and whether some aspects of transportation could be improved to enhance that experience. Each focus park overview is a little different, reflecting the unique aspects of the park depending on its geography, size, and resources. A summary of the interviews and surveys conducted as part of the LRTP appears in the description of each focus park. The complete survey and summary of results are contained in Appendix A – Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

## Resource Protection .....

The Resource Protection section of this report examines how natural, cultural, and historic resources are interrelated with transportation. Hard data to support this analysis is thin, especially at the regional level, but some impacts are known and identifiable. Scenic driving and wildlife viewing is one of the most popular visitor experiences at many IMR parks. However, the presence of wildlife adjacent to or crossing roadways contributes to wildlife/vehicle conflicts, traffic congestion, and stressed vegetation as vehicles pull off on a roadside. Habitat connectivity is critical for wildlife species. Roadwork projects causing habitat fragmentation could trigger wildlife movement, which in turn could lead to an increase in wildlife/vehicle conflicts. To mitigate air quality impacts, many parks have begun developing Climate Friendly Action Plans, which address greenhouse gas emissions and strategies to reduce them.

The plan does focus on the levels of use of certain transportation facilities like administrative roads and parking areas that are under-utilized, too costly to maintain to desired levels, redundant, or have unreasonable and identifiable resource impacts. The plan highlights some types of facilities that may be candidates for removal or decommissioning. Restoring the areas impacted by these facilities could serve multiple purposes - like saving scarce maintenance funds for other critical needs and improving habitats or otherwise mitigating negative impacts.

The effort to uncover the ways in which transportation either enhances or degrades scenic and cultural landscapes, including natural resources, historic assets, and cultural environments was supported by the focus park survey. Park managers are very concerned about these issues and were asked to explain problems and successes in documenting or mitigating unwanted impacts on park resources. The summary results of the survey for each focus park are illustrated in a special section on focus parks that helps to further recognize the unique aspects of each park.



..... Sustainable Operations

Sustainability is the capacity to endure. The National Park Service’s ability to preserve cultural and natural landscapes in perpetuity is inextricably tied to achieving sustainable stewardship. Sustainability is often defined as encompassing three dimensions: environmental, economic, and social. As such, sustainable transportation systems are those that are environmentally, economically and socially durable. The Intermountain Region is challenged on multiple fronts to remain – or become – sustainable for the next generations. Adopting and implementing sustainable measures has quickly become one of the chief priorities for the National Park Service and Intermountain Region. By definition, not being sustainable means having a short-lived mission. The Intermountain Region seeks to adapt to the changing organizational, funding, and natural environments. Effective adaption to change is the best way to preserve resources for the future enjoyment of visitors.

The Intermountain Region long range transportation plan is an active piece of this puzzle. As a steward of national cultural and natural jewels, the National Park Service is working to not only decrease its environmental footprint, but also to adapt to future conditions. These activities are reinforced by recent Executive and Secretarial mandates that require agencies to become more sustainable and to track and mitigate greenhouse gas emissions.

Several policy and operational guidelines are already available to this LRTP which incorporates their spirit and transportation-related recommendations into the plan. Key initiatives, plans, and documents include:

- National Park Service Green Parks Plan
- National Park Service Climate Change Response Strategy
- The Sustainable Operations and Climate Change – Climate Friendly Parks Program
- Intermountain Region Sustainability Strategy – Phase One FY 2013 and Beyond

### *The NPS and Global Climate Change*

Global climate change threatens the integrity of the national parks and challenges the NPS mission to leave park resources unimpaired for future generations. As a result, the National Park Service has developed the NPS Climate Change Response Strategy (September 2010) to provide direction for addressing its impacts. Strategic actions are being developed using knowledge based on four integrated components:

- science,
- adaptation,
- mitigation, and
- communication.

More than 70 parks (11 in the Intermountain Region) are already participating in the “Climate Friendly Parks Program” (a collaboration between the National Park Service and the Environmental Protection Agency begun in 2002), which provides guidelines to reduce their carbon footprint and communicate the consequences of climate change through interpretive programs and educational materials.

## CHAPTER 1: SUMMARY OF KEY FINDINGS AND CHALLENGES: THE IMR TRANSPORTATION SYSTEM STORY

The Intermountain Region maintains over \$6.7 billion in transportation assets,\* including 3,200 lane miles of roadway and 37 million square feet of parking areas. The range of reported conditions across large and small parks is wide, but inclusively add up to a large backlog of deferred maintenance that approaches \$900 million and continues to grow. There are six Alternative Transportation Systems across the region - Glacier, Bryce Canyon, Zion, Rocky Mountain, Grand Canyon, and Mesa Verde - which are owned and operated by the NPS, operated under contract, or operated through a partnering agreement. An additional 16 parks provide some type of people movement by a non-NPS business or service. The large system and the costs of management challenge the IMR to find effective solutions for the near and long terms. This situation may not be fiscally sustainable.

This chapter provides a summary of findings resulting from the analysis of the aggregate characteristics of transportation system features and direct input from the 12 focus parks. The narrative that emerges here describes components of the multimodal transportation system that are problematic in one way or another. These are “actionable” items – more than just a matter of interest, the information presented here illuminates problems.

Detailed analysis of the IMR system is contained in Chapter 3 – Intermountain Region Transportation System. The Baseline Conditions technical report does not identify “needs” as traditionally described in LRTPs. That necessary function will be documented in a separate technical report, Needs Analysis. However, this report does direct us to operational and condition information that will be useful in determining if the conditions reported here meet the Goals and Objectives described earlier and can then be tabulated as needs in subsequent analyses.

This look at the data tells us much of what is going on in the IMR. These summary findings are presented by goal area, following the overall framework for the LRTP. Note that many findings affect multiple goals and could be identified in more than a single area. This plan assigns the findings to a single area, and also acknowledges the cross-cutting effects.

*\*Transportation assets in this calculation include roadways, parking areas, bridges, major culverts, and tunnels.*

## TOP 10 GENERAL FINDINGS

This report identifies the following top 10 findings:

### 1. Deferred Maintenance Activities are Costly

Surface maintenance is often deferred due to high costs and, when paired with restricted budgets and competing needs, may not receive a level of funding that reduces the backlog. The price tag for deferred maintenance is still increasing. Recent Cycle 4 data indicates a significant improvement from Cycle 3 conditions for road pavement, but a significant decline for parking conditions between Cycle 3 and 4. Deteriorating conditions not only stress administrative budgets, but negatively impact the general visitor experience. Maintaining the existing system at preferred performance levels will continue to be a fiscal drain, causing investment trade-offs in other mission-critical areas.

### 2. Large Parks Consume Over 50% of Transportation Budget

Four large parks consume over 50% of the transportation facilities budget. The IMR will have difficulty meeting regional goals for facility condition without increased investments in these parks. However, given the scarcity of funds, increased investments in a few parks would leave conditions in many smaller parks in poor condition, with corresponding negative impacts on visitor experience and resources. Meanwhile, seven IMR parks with high visitation contain a majority of transportation assets. Significant reductions in deferred maintenance are most likely to occur with investments in parks with the greatest need.

### 3. Congestion Overwhelms Some Parks

Total visitation in the IMR peaked about 10 years ago, but is again growing steadily in large parks. However, overall regional visitation growth is much more moderate. Chronic congestion in the most visited parks threatens all aspects of the park experience. Smaller parks also suffer some congestion, especially at key locations and during peak seasons. Visitor complaints are often directed at congested parking and long wait times at entrance stations and for shuttles. Some visitors, preferring a more leisurely experience, substitute visits to less used recreation areas, including national forests and state/local parks. Congestion management efforts have met with mixed success and are limited by funding, inability to construct additional capacity, and an institutional reluctance to match visitation to capacity.

### 4. Visitor Demand Management Programs on the Horizon

While some of the busiest parks have begun to actively manage visitation through parking management, real time congestion information, and other means, other less visited parks also have spot congestion problems. Few parks overall have attempted to match visitation to capacity, either of transportation facilities or resources. The impacts of transportation – positive or negative – on visitor experience and on resources are often studied at the project level, but regional impacts, and the relationship to policy, have emerged as key unresolved issues.

### 5. Parking Problems Near Top of List

Parking demand, including subcomponents of congestion, safety, asset condition, and resource damage is a growing problem. While some parks have the ability to add to parking capacity, others are limited by potential resource impacts, space, and costs. Unauthorized parking when primary lots fill up is of special concern due to associated vegetative and erosion effects, social trailing, and pedestrian safety. Many parks struggle to deal with the impacts of large vehicles, especially recreational vehicles (RVs) and tour buses, in parking areas designed for smaller vehicles.

In addition, visitors may circle crowded parking areas causing air quality impacts and requiring additional law enforcement support, pavement conditions in parking areas are poor to fair and are declining, and almost 25% of vehicle crashes occur in parking areas.

## **6. Changes in Visitation Patterns**

Visitation patterns have changed so that longer, more leisurely trips have evolved to more intensive visits in larger vehicles. Visitors often expect park amenities to support the needs associated with these trips, including on-the-go electronic information, more recreational vehicle provisions like wider roads, more convenient parking with comfort amenities, RV hookups, and updated visitor centers where families can experience the park on an accelerated schedule.

## **7. Improve Total Cost of Ownership and Capital Investment Planning**

Long-term costs to maintain and operate transportation facilities and services may rival or exceed the initial capital investment. The National Park Service is moving away from a capital construction paradigm toward a sustainable maintenance and operations model. Transit operating costs over the long term may not be financially sustainable. Plans at all levels need to fully incorporate the total cost of ownership so as to accurately estimate future financial requirements.

## **8. Some Facilities Are Ripe for Decommissioning or Repurposing**

A large inventory of underutilized or under-maintained roadways, parking areas, and other facilities indicates that selected parts of the inventory may no longer serve their intended purpose. Removing these facilities has the potential to greatly strengthen the NPS' resource protection efforts by restoring impacted areas to a natural condition. Additionally, removing facilities from the maintenance chain has tremendous potential to reduce costs, focus maintenance on mission-critical facilities. However, the National Park Service is acutely aware of the side effects of removing facilities from the inventory, which range from the actual deconstruction costs, to natural resource impacts, to possibly reduced service levels.

## **9. Parks Begin to Adopt Sustainable Operations as Way of Business**

Many parks have made strides toward sustainability and the region has begun to offer guidance in this area. However, sustainability as a way of doing business has yet to permeate institutional practices at the financial, social, and environmental levels. New or emerging policies to guide sustainability at all levels may be in conflict with historically stated needs to improve infrastructure; the financial and environmental costs may not be realistic or sustainable.

## **10. Data Gaps Hamper Comprehensive LRTP**

This planning process is constrained by data inconsistencies and gaps. Lack of data collection, analysis and management systems make performance measures difficult to implement. Several areas should be addressed between this plan and future updates including: transportation trails, bicycle and pedestrian facilities, consistent asset database reporting and interconnectivity, parking and congestion data management, resource risk analysis, and long range costs. Transportation modes that are not fully considered in the pilot LRTP and may be addressed in future updates include: recreation trails, water trails, water, air and rail transportation. Data gaps are further addressed in Chapter 5.

## KEY FINDINGS AND CHALLENGES BY PLANNING GOAL CATEGORY

The following Key Findings describe the challenges revealed by the analysis of existing conditions throughout the IMR. The findings have been assigned to goal areas; however, the LRTP recognizes that many issues are interconnected and “cross-cut” across multiple goal areas. The remainder of this report provides the detailed data that support the findings.

Asset Management Key Findings & Challenges	
<b>Facility Condition May Reflect Poorly on Visitor Experience</b>	<p>The IMR manages and maintains over \$6.7 billion in transportation assets. Current deferred maintenance totals \$877 million, resulting in a Facilities Condition Index (FCI) of 0.131, rated Fair overall. In order to achieve significant improvements in FCI, either maintenance backlog, capital assets, or both will need to be reduced.</p> <p><b>Other affected goal areas: Visitor Experience; Resource Protection</b></p>
<b>Deferred Maintenance Concentrated in Large Parks</b>	<p>Sixty-six percent of the region’s deferred maintenance is attributed to four high visitation parks, while 77% of DM is associated with Class I roads. Continued targeted investments toward high visitation parks and major roads may result in fewer funds available for other needs.</p> <p><b>Other affected goal areas: Sustainable Operations</b></p>
<b>Roadway Pavement Condition Improves While Parking Conditions Deteriorate</b>	<p>Recent investments in roadway maintenance show marked improvements in overall PCR, with the percent rated Good/Excellent having risen from 11% in Cycle 3 to 66% in Cycle 4. During the same time period, the reported condition of parking areas rated Good/Excellent fell from 47% to 25%. The relationship of expenditures on different programs, and the corresponding effects on regional goals, must be considered within the context of limited budgets. A large and continuing investment will be required to maintain facilities in acceptable condition over time.</p> <p><b>Other affected goal areas: Visitor Experience; Mobility, Access, &amp; Connectivity</b></p>
<b>Bridges in Generally Good Condition</b>	<p>Only 10 bridges in the region have a Priority of Improvement rating of A or B, indicating the need for substantial rehabilitation. All 10 are currently programmed for improvements to bring them within acceptable levels..</p> <p><b>Other affected goal areas: Mobility, Access, &amp; Connectivity</b></p>
<b>Focus on Capital Investment Strategy</b>	<p>National Capital Investment Strategy criteria indicate that assets with a priority less than 50 and/or in Poor/Serious condition may no longer serve their purpose and should be considered for removal. PCR and FCI data indicate a significant percentage of roadways and parking areas meet these criteria. Removing these underutilized or under maintained facilities from the inventory would result in large savings over time. Some of the lower rated assets may not be public facing, but are still very necessary (e.g. fire roads, administrative roads/parking, etc.). There is also a cost to demolish or remove these assets. There may be other options available – maintaining at a lower standard, “mothballing,” or made inactive.</p> <p><b>Other affected goal areas: Sustainable Operations</b></p>
<b>High Visitation Affects Asset Conditions</b>	<p>Seven parks (region wide) with high recreational visitation contain a majority of transportation assets and current asset value and account for 66% of roadway DM. Significant reductions in DM are most likely to occur with investments in parks with the greatest need.</p> <p><b>Other affected goal areas: Visitor Experience</b></p>

Mobility, Access, and Connectivity Key Findings & Challenges	
<b>All Major Transit Systems Report Congestion and Related Challenges</b>	<p>Extensive wait times, crowding on buses and shuttles, and visitor complaints are reported throughout the system, especially during peak seasons. Adding transit capacity may be effective in some parks, depending on seasonality, operating &amp; maintenance costs, type of park, terrain, and ability to mitigate often unanticipated resource/visitor impacts at destinations. ATS is clearly not a one-size fits all solution and must be carefully tailored to fit the context.</p> <p><b>Other affected goal areas: Asset Management; Visitor Experience</b></p>
<b>NPS Transit Systems Connecting to Gateways Seek Funding</b>	<p>Several transit systems that reach outside park boundaries in order to better integrate facilities are solely supported by the NPS, with no financial contribution by the communities that they serve. ATS funding availability, especially for operations, is severely limited.</p> <p><b>Other affected goal areas: Sustainable Operations</b></p>
<b>Transit Operating Costs May Not Be Sustainable</b>	<p>Transit operating costs are rising at a faster rate than can be supported by fee increases or other NPS programs. These projected deficits hampers the financial sustainability of ATS in most of the region's transit systems. Given the role these systems have in meeting travel demand and supporting a positive visitor experience, the IMR will need to consider alternative financing and reconsider the implementation of new systems or expansion of existing systems.</p> <p><b>Other affected goal areas: Sustainable Operations; Asset Management; Visitor Experience</b></p>
<b>Number of Crashes is of Concern, but Declining</b>	<p>The total number of crashes is generally lower than might be expected, declining from a 1994 peak, and concentrated in a few parks with higher traffic volumes: Yellowstone, Saguaro, and Zion. Reasons for crashes are park, facility, and location specific and cannot be generalized.</p> <p><b>Other affected goal areas: Visitor Experience</b></p>
<b>Crashes in Parking Areas</b>	<p>While overall crashes have declined steadily, some safety aspects clearly need attention. About 17% of crashes occur in parking areas or driveways, probably linked to congestion, poor circulation design, and oversized vehicles.</p> <p><b>Other affected goal areas: Asset Management; Visitor Experience</b></p>
<b>Congestion in Parking Areas</b>	<p>Many parks cite the lack of adequate parking, including for large vehicles, as a significant impact on visitors and management activities. Expansion of parking facilities within park boundaries presents financial and environmental costs that must be balanced with visitor access and experience goals.</p> <p><b>Other affected goal areas: Asset Management; Resource Protection, Visitor Experience</b></p>
<b>Increasing Visitor Diversity</b>	<p>Increasing visitor diversity is often inadequately supported by transportation facilities and services. For example, over 10% of visitors report a disability, yet many NPS transportation facilities are not yet compliant with ADA or ABA regulations. Visitor experience for non-English speaking groups is hampered by a lack of universal signage and information in multiple languages.</p> <p><b>Other affected goal areas: Visitor Experience</b></p>
<b>Congestion Reported at Many Parks</b>	<p>Congestion occurs at a variety of facilities including parking areas, park access roads, visitor centers, trailheads, and scenic overlooks. Building additional capacity often has unintended negative impacts to resources. The link between congestion and transportation capacity is being explored in some of the most congested parks, and a national congestion management system is underway. Some congestion management tools have produced unanticipated secondary congestion impacts, such as pulsing effects at transit stops.</p> <p><b>Other affected goal areas: Asset Management; Visitor Experience</b></p>



Visitor Experience Key Findings & Challenges	
<b>Recreation Visitation Increased 3.2% in 10 Years (Region-wide)</b>	<p>Growth in recreation visitation is not uniform across the region, ranging from 32% (YELL) to -22% (CHIC). The reasons for the broad range are complex, but many parks do struggle to manage an influx of visitors. Visitation is calculated in most cases by vehicle entrance counts factored by vehicle occupancy rates which are often outdated.</p> <p><b>Other affected goal areas: Asset Management; Sustainable Operations</b></p>
<b>Non-Recreation Visitation Decreased 12.4% in 10 Years (Region-wide)</b>	<p>The change in non-recreation visitation is not uniform park-to-park, and is a significant problem for some units. The decrease seems to be correlated with the health of local economies, since the majority of non-recreational trips is associated with commuting through parks to and from major employment centers. If/when employment increases, these trips can be expected to regenerate in proportion. At issue are the costs associated with maintaining pavement condition from high traffic volumes which are not subject to entrance fees, as well as higher speeds and safety concerns with commuters vs. those looking for a leisurely park experience.</p> <p><b>Other affected goal areas: Asset Management; Sustainable Operations</b></p>
<b>Evolving Travel Patterns</b>	<p>Fully 90% of visits are planned experiences (not spontaneous), while 60% of visitors travel through parks as part of a multiple destination trip. Twenty-seven percent of visitors bring more than one vehicle to the park, including towed vehicles like daily driving vehicles, camping trailers, boats, jet skis, and all-terrain vehicles (ATVs). Recreation hours per visit are down a total of 4.4%, having decreased from 9.4 to 8.4 hours over a 20-year period.</p> <p><b>Other affected goal areas: Asset Management</b></p>
<b>Large Vehicles Have Multiple Impacts</b>	<p>Over 80,000 commercial tour buses and RVs enter IMR focus parks during the month of July. This continues to be a major impact on many parks that are on the vacation circuit or within reach of Las Vegas or other major metropolitan areas. Impacts extend to parking, conflicts on traditionally narrow roads, noise, and concentrations of visitors in environmentally sensitive area, and congestion.</p> <p><b>Other affected goal areas: Asset Management</b></p>
<b>Visitor Information</b>	<p>Only 25% of visitors obtain pre-trip information from the park websites to assist in trip planning, pointing to the high value of in-park information. Visitors enjoy and rely on mobile information sources, where available. A few parks have employed new technologies that distribute information to mobile devices, especially for interpretive services, however very few park units indicate using information technologies to manage demand.</p> <p><b>Other affected goal areas: Mobility, Access, &amp; Connectivity</b></p>
<b>ITS Applications Help Mitigate Congestion</b>	<p>A limited number of parks have implemented ITS solutions. Success in managing congestion through ITS has been spotty, with some notable exceptions like at GRCA. Electronic ticketing, transit-related information, and parking management are shown to be effective, but costs, technology availability, and perceived visual impacts limit effective application.</p> <p><b>Other affected goal areas: Asset Management; Mobility, Access, &amp; Connectivity</b></p>

Resource Protection Key Findings & Challenges	
Transportation Carrying Capacity	<p>The ability of transportation systems to absorb additional visitation, either by adding capacity or allowing congestion to increase, may be incompatible with resource protection goals. Transportation capacity is sometimes out of balance with resource carrying capacity. Travel demand management techniques such as employing reservation systems is under consideration in some congested parks.</p> <p><b>Other affected goal areas: Sustainable Operations</b></p>
Historic Roads	<p>The IMR is the custodian of numerous aging historic roads, each of which require careful consideration when planning improvements or maintenance. The financial and environmental costs of preservation and maintenance are not universally calculated into project costs, leading to unanticipated costs or ineffective resource management.</p> <p><b>Other affected goal areas: Asset Management</b></p>
Wildlife/Vehicle Crashes a Concern for Resources and Visitors	<p>About 17% of all crashes are related to wildlife, although wildlife/vehicle crashes are associated with very high rates in YELL and GRTE. Wildlife mortality as a result of animal/vehicle crashes may be under-reported in some parks, especially for smaller animals that cause less damage to vehicles. Infrastructure solutions to this issue tend to be very expensive and effective only under certain conditions.</p> <p><b>Other affected goal areas: Asset Management; Mobility, Access, &amp; Connectivity</b></p>
Cumulative Secondary Impacts	<p>Numerous smaller impacts stemming from transportation may add up to significant impacts over time and when considered together. The following five items are of special concern overall.</p>
Threatened and Endangered Species/Habitat	<p>Changing visitor access can have direct and indirect impacts on habitat management and fragmentation. For example, poaching of valuable plants has reached critical proportions in some desert locations, and habitat fragmentation may contribute to vehicle/wildlife crashes. Roadway and parking expansion of congested facilities near sensitive habitat will continue to require careful balance.</p> <p><b>Other affected goal areas: Asset Management</b></p>
Noise and Light	<p>Noise from buses, motorcycles, and general traffic, as well as excessive light from parking and visitor areas are frequently cited as negative impacts to treasured resources like solitude, quiet, and dark skies.</p> <p><b>Other affected goal areas: Asset Management; Sustainable Operations</b></p>
Air Quality	<p>Air quality impacts from transportation, especially diesel-powered buses, are frequently cited contributors to poor air quality. The effects are most noticeable in congested parks and those in or near designated non-attainment areas. Some parks have completed emissions inventories for regulated contaminants and other greenhouse gasses.</p> <p><b>Other affected goal areas: Asset Management; Sustainable Operations</b></p>
Stormwater Runoff	<p>Stormwater runoff from paved areas increases stream flow and erosion and may be aggravated by more severe periodic runoff events stemming from climate change. The runoff carries contaminants into the watershed and threatens culverts, bridges, and roadways.</p> <p><b>Other affected goal areas: Asset Management; Sustainable Operations</b></p>
Vegetative Cover	<p>Social trailing contributes to local erosion and degradation of vegetative cover. Problematic areas include unauthorized parking and concentrated impacts from foot traffic near shuttle stops and parking areas. To promote roadside ecology for non-construction situations, individual parks must fund re-vegetation from outside the Transportation Program.</p> <p><b>Other affected goal areas: Asset Management; Sustainable Operations</b></p>

Sustainable Operations Key Findings & Challenges	
<b>Sustainability Emphasis Growing</b>	<p>Sustainability is emphasized throughout all IMR planning and operations and is inherent to each goal area. The NPS has outlined national strategies to achieve sustainable goals across the agency. The economic (<i>Capital Investment Strategy</i>), social (<i>Call to Action</i>), and environmental (<i>Green Parks Plan</i>) “legs of the stool” provide guidance to parks on this all-encompassing initiative.</p> <p><b>Other affected goal areas: Asset Management; Mobility, Access, &amp; Connectivity; Visitor Experience; Resource Protection</b></p>
<b>Total Cost of Ownership Often Overlooked in Planning, Operations, and Maintenance</b>	<p>Deferred maintenance and other items like transit shuttle replacement and operational costs are inherent to the Total Cost of Ownership, but not always factored into planned project prioritization and improvements. It is critical to determine what can be properly maintained over the long term. New assets and services must be recognized for their liabilities as well as potential benefits.</p> <p><b>Other affected goal areas: Asset Management</b></p>
<b>Climate Change Key to Sustainability and Resource Protection Goals</b>	<p>The prospect of global climate change introduces new challenges for the parks. Threats include drought, more frequent and extreme storm events, wildfire, and impacts to transportation infrastructure resulting from temperature and moisture changes. Eleven parks in the IMR have achieved Climate Friendly Park status, while four more have entered into the certification process. Each park will identify context sensitive goals and strategies when developing a Climate Friendly Park Action Plan.</p> <p><b>Other affected goal areas: Resource Protection</b></p>
<b>Regional Communities Play Vital Role in Many Parks</b>	<p>Many parks have active support groups in neighboring communities and depend heavily on volunteer or other partnering arrangements to support operations. Parks and regional communities are often economically and environmentally interdependent. Managers and local supporters have come to understand the inter-relationships of ecosystems at the landscape level and that effective management must consider the big picture. However, partners at all levels continue to be fiscally challenged and lack either the resources or the incentive to contribute sufficient funds to alter the dynamic of limited NPS funding for major projects and maintenance.</p> <p><b>Other affected goal areas: Resource Protection</b></p>
<b>Shortfalls in Transit Capital Replacement and Operations and Maintenance</b>	<p>Financial transit system pro forma for six IMR parks show small to significant shortfalls in transit support funding by 2014. IMR and the parks will need to consider improvements to operational efficiency, find new financial partners, consider cut-backs in service and/or other methods to attain financial sustainability.</p> <p><b>Other affected goal areas: Mobility, Access, and Connectivity; Visitor Experience</b></p>
<b>Changing Federal Budget Environment</b>	<p>Federal funding for transportation improvements is expected to be maintained at or below current levels, both for NPS and states. This reality will challenge IMR and parks to compete effectively for additional revenue and make tough choices to maintain pavement, bridges, transit, and other services in adequate condition.</p> <p><b>Other affected goal areas: Asset Management; Mobility, Access, &amp; Connectivity; Visitor Experience; Resource Protection</b></p>
<b>Fiscal Restrictions Limit Creative Solutions</b>	<p>Parks are limited in their ability to create effective financial partnerships due to restrictions on some funding sources on spending capital funds outside park boundaries. For example, several parks would like to establish remote parking either outside the gate or in a gateway community, then shuttling visitors to the park. In the absence of policy changes to broaden such expenditures, parks will increasingly need to build and sustain partnerships with stakeholders and gateway communities. Clarifying the economic benefits to stakeholders can help encourage mutually beneficial investments.</p> <p><b>Other affected goal areas: Asset Management</b></p>

## CHAPTER 2: INTERMOUNTAIN REGION TRANSPORTATION PROGRAM OVERVIEW

This chapter discusses the current IMR transportation program organization and planning process. Several observations indicate that this process should be considered a work in progress. Improvements to the process will emerge as this LRTP moves forward to strategic recommendations that will make the program more sustainable, transparent, accountable, and efficient.

### MOVING AHEAD FOR PROGRESS IN THE 21ST CENTURY ACT

Moving Ahead for Progress in the 21st Century Act (MAP-21), the recent federal transportation reauthorization bill, went into full effect October 1, 2012. This report was prepared during the transition from the SAFETEA-LU to MAP-21. MAP-21 authorizes federal programs through September 30, 2014. The bill consolidates the number of federal programs by two-thirds to focus resources on key national goals and reduce duplicative programs.

Many smaller programs, including most discretionary programs such as the Federal Highway Administration (FHWA) Public Lands Highways Discretionary program and the National Scenic Byways program have been eliminated, but several of the eligible types of projects are covered in other programs. For instance, the Paul S. Sarbanes Transit in the Parks program has been eliminated. However, previously eligible projects remain eligible under other programs.

The consolidation of several multi-modal programs may lead to greater competition for funds among all types of transportation projects. Therefore, the ability of the NPS to access alternative sources of funding, such as public-private partnerships, smaller grant opportunities, and potential local and state sources will be critical to future transportation initiatives.

### ASSET MANAGEMENT STRATEGIES

The National Park Service completed the *NPS Capital Investment Strategy Guidebook: Goals, Objectives and Functional Elements, July 2012 (CIS)* to assist park units and regions in developing effective and financially sustainable solutions for the future. The Intermountain Region will use these guidelines to help align regional with national goals. Implementation of the Capital Investment Strategy began with the new fiscal year, October 1, 2012, and guides project selection processes to be funded in FY 2015 and beyond. At the time of this writing, CIS is only being used to select projects under the Repair/Rehab and Line Item Construction programs. Following this initial roll out, it will most likely be used for additional fund sources.

The CIS is designed to promote the following mission goals:

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

## ACHIEVING PERFORMANCE BASED GOALS

The Intermountain Region wishes to create a tighter connection between strategic goals, measured performance in relation to goals, identification of needs as a deficiency in performance, and project selection that improves performance – and therefore goal achievement. The Intermountain Region also must expand its partnerships outside historically reliable programs in order to increase funding opportunities and flexibility. Meeting this challenge will enable the IMR to demonstrate its effectiveness in the expenditure of public funds in pursuit of the mission. Such fiscal effectiveness, in an era of belt-tightening and competition for scarce resources, will serve the agency well in its quest for sustainable operations.

## EVOLUTION OF THE PROGRAM

Although “transportation” is not written into the core mission of the NPS, providing for visitor access and movement within our national parks is the most direct method the NPS has used to fulfill the mission requirement “providing for the enjoyment” of the national parks.

In 1924, the National Park Service prepared to construct a road through the high alpine reaches of Glacier National Park. Understanding that this project would involve an intensive engineering effort, the National Park Service signed a landmark agreement with the Bureau of Public Roads (BPR) to collaborate. The BPR evolved into the FHWA. The construction of Going-to-the-Sun Road in Glacier National Park was the beginning of a longstanding partnership for construction of roads in national parks.

In 1983, President Reagan signed a law creating the Federal Lands Highway Program (FLHP) providing dedicated funding for road rehabilitation and construction projects on federal lands. Since 1983 Congress has continued to re-authorize the FLHP. The former FLHP was renamed and reconfigured with the 2012 passage of MAP-21 as the Federal Lands Transportation Program (FLTP). The FHWA distributes funds from the Highway Trust Fund (the federal gas tax) to support the FLTP.

Transportation needs in the parks continue to evolve, with each new law structured to better address the needs. Through the first 60 years, the program focused mainly on road construction and rehabilitation of existing roads. Beginning in the 1980s and early 1990s parks began looking for ways to relieve congestion at highly visited sites. In the Intermountain Region, Rocky Mountain and Grand Canyon National Parks began transit systems using school buses and park operational funding to provide an alternative method of access to congested areas. In addition, road work within the parks began changing from new construction to the maintenance of existing infrastructure.

In an effort to accommodate these changes, the FLTP began providing funding for “alternative transportation” in the parks while road and bridge projects continue to focus on maintenance and reconstruction of existing infrastructure. The policies of the NPS Transportation Program have subsequently evolved to accommodate these changes. The Transportation Program embraces all elements of the transportation system, including roadways, bridges, tunnels, trails, shuttle systems, multimodal trails, wayfinding and signs, and other assets. Transportation-related buildings, fueling areas, and transit maintenance facilities are all within the purview of the transportation program.

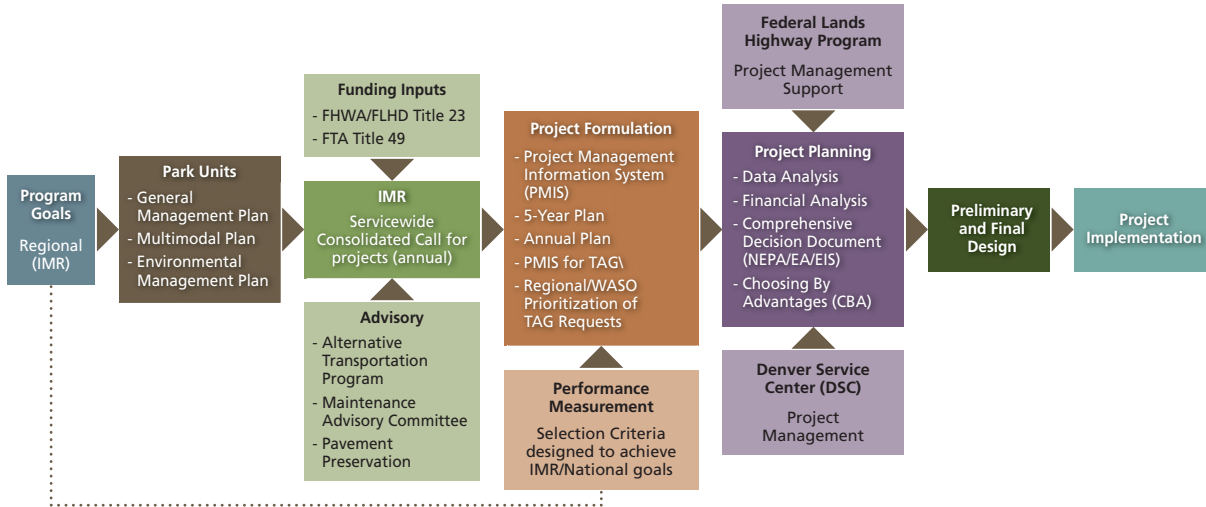
## MANAGEMENT OF THE TRANSPORTATION PROGRAM

The Transportation Program depends to a great extent on funding provided through FLTP, as described in USC Title 23, Section 204. The Transportation Program administers those funds, making distributions to projects throughout the region. In addition, many other fund sources within the NPS provide funding for transportation projects and asset preservation. One of the challenges of the evolving program is to manage transportation related work and needs that fall outside of the funding



parameters of the FLTP, and hence the Transportation Program. The following sections describe the major programs, both from FLTP and other sources.

### IMR Current Transportation Programming Process



The Park Roads and Parkways Program includes three categories specified in the FLTP:

- Category I – The Road and Bridge Rehabilitation and Road and Bridge Construction/Realignment category provides the largest funding source for the Intermountain Region.
- Category II – Congressionally Mandated Parkway. There are no designated parkways in the IMR.
- Category III – The Transportation Management Program is intended to integrate all modes of travel.

Park facility managers and regional program managers encourage coordination between fund sources when there is a possibility of doing similar work and to manage projects across fund sources.

### Category I - Road and Bridge Rehabilitation

Category I comprises two subcategories described below.

#### *Resurfacing, Restoration, and Rehabilitation*

Resurfacing, Restoration and Rehabilitation (3R) work is considered to be heavy maintenance. Work must occur on the existing roadway bench, within the existing alignment. Work on drainage structures, existing retaining walls, slope failures, bridges and spot traffic safety improvements are eligible for 3R work and usually require working “off the bench.”

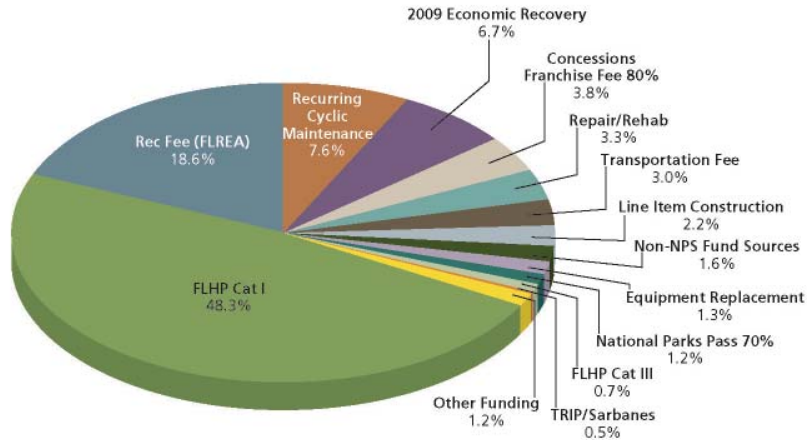
Beginning in 2008, the Intermountain Region began a Pavement Preservation Program combining FLTP 3R funds with Regular Cyclic Maintenance funds to allow for all pavements to be treated once every eight years. This program has eased the burden on parks to schedule and obtain funding for pavement treatments. In the past, treatments like chip, micro, and slurry seals were funded solely by the Cyclic Maintenance fund source. Between \$5-\$7 million in Cyclic funds were used annually for this maintenance activity. However, limits on project size within the Cyclic Program were not allowing parks to keep up with pavement maintenance needs. Beginning in 2008, funds were combined from the two fund sources to complete the work under contract with Central Federal Lands Highway Division.



## Resurfacing, Restoration, Rehabilitation, and Reconstruction

Resurfacing, Restoration, Rehabilitation, and Reconstruction (4R) projects include realignment, new construction, and restoration of areas previously disturbed by road construction activity. In the Intermountain Region, the vast majority of current 4R projects are in Yellowstone National Park. The park has an ambitious program of road projects that will result in rebuilding the Grand Loop and all five main park entrance roads. The park is reconstructing the original, narrow roads with new construction, realigning the roads to remove impacts from sensitive natural and cultural resources and widening them to a 30' top width. This increase in width allows for bicycle travel, eases congestion and emergency access through "animal jams," and allows large vehicles to travel the road network more safely. Because Yellowstone is large and has approximately 25 percent of the region's roadway assets, the park receives approximately 25 percent of the regional allocation of FLTP funds and does not compete for funding.

IMR FUNDED PROJECTS 2004-2009 BY FUNDING SOURCE



## Category III - Alternative Transportation Program

The Alternative Transportation Program is intended to integrate all modes of travel in national park system units, including transit, bicycle, pedestrian, and motor vehicle. The Transportation Management Program also supports transportation planning studies.

Approximately \$22 million per year is taken off the top of the national FLTP program to fund Category III. Prior to 2011, the program was managed nationally, but then transferred to regional management. Intermountain has received approximately \$2.4 million the past two years in Category III funds. The current IMR Transportation Management Program is heavily dominated by planning projects and the region has been able to stay within the available funding. Those planning projects are just beginning to spawn the more expensive construction projects. In addition, some of the existing transit system buses are becoming due for replacement. It is expected that need for implementation/construction projects under Category III will soon overcome the available funds.

## Operation of the National Park System

The Operation of the National Park System (ONPS) provides the base funding for national parks on a recurring basis. It is the primary source of operational funding. Parks request increases to their park base through the Operations Formulation System (OFS). This appropriation contributes to three fundamental goals for the National Park Service:

- Protecting, restoring, and maintaining natural and cultural resources in good condition and managing them within their broader ecosystem and cultural context.
- Managing resources using adequate scholarly and scientific information.
- Providing for the public enjoyment of and visitor experience at parks.

## **Other Major Fund Sources Used for Transportation Projects**

### *Repair/Rehabilitation*

Repair/Rehabilitation is a fund source that is managed regionally and is to be used for the minor repair and rehabilitation of roads, parking lots, campground roads, and bridges. There is a \$500,000 funding cap per project. It is the policy of the repair/rehab program not to fund any project that is FLTP eligible.

### *NPS Line-Item Construction Program*

Funds to develop new parks and areas within parks are budgeted through the Line-Item Construction program. Funds from this program are appropriated by line item in the yearly Department of the Interior appropriation act. The Line-Item Construction program is limited to projects costing \$1 M - \$30 M, with an average cost of around \$15 M.

### *Federal Lands Recreation Enhancement Act (FLREA)*

The Federal Lands Recreation Enhancement Act (FLREA) authorizes parks to collect entrance fees (limited to \$25). Parks that collect more than \$500,000 in entrance fees keep 80% of those fees. The remaining 20% is gathered and managed by WASO as a fund for those parks that do not have the authority to collect fees. Parks that collect less than \$500,000 keep 100% of the fees they collect.

FLREA projects are to support visitor use projects. Parks have discretion as to how they use FLREA dollars. In the IMR, Grand Canyon National Park has been using FLREA funding to construct large transportation projects, including rebuilding the historic Hermit Road and building a new parking facility at the Mather Point Transportation Center. The FLREA program was not continued in MAP-21 and will sunset in 2014.

### *Transportation Fee*

The transportation fee program is authority granted to individual parks with transit systems in place. The purpose of the authority is to allow the park to collect a fee that is embedded in the entrance fee visitor's pay when entering the park. Parks keep and may use 100% of fees for transportation systems. These fees reduce the park's FLREA funds available for other projects, but are used to support operation of transit systems. Because FLREA entrance fees are capped at \$25, and the cost associated with operation and maintenance of transit systems continue to rise, most parks with a transportation fee have seen the proportion of entrance fees available for other park uses decline.

### *Regular Cyclic Maintenance*

Regular Cyclic Maintenance is allocated to the parks on a formula. This fund source is to be used for routine maintenance projects. Pavement treatments, i.e., chip seals and other surface treatments, are typical Cyclic Maintenance projects.

### *Pavement Preservation Program*

Currently, \$3 million per year is taken off the top of the Cyclic Maintenance program, prior to allocation, to be used in the Pavement Preservation Program. Approximately \$5.5 million in additional funds are provided from the FLTP. Since 2007 the region has been managing the pavement preservation program for the parks. This eliminated the need to compete for funding and ensures that pavement assets are maintained on a regular cycle.

### *Concessions*

All concession contracts contain franchise fee and other financial obligations that reflect the probable value of the authorization consistent with the law. Twenty percent of the funds are made available to support concession activities throughout the NPS. Eighty percent of the funds are made available to the park in which the funds were collected. All projects over \$500,000 must come to WASO for approval and be considered by DAB.

## **ASSET MANAGEMENT SYSTEMS**

The Transportation Program employs a robust method of gathering data on both pavements and on bridges. Bridges are inspected every other year by staff at Eastern Federal Lands Highway Division under the Bridge Inspection Program (BIP). The BIP generates a report that categorizes bridges by the level of work needed to maintain the structures. IMR staff work with Federal Lands to ensure that an accurate list of potential bridge projects is maintained and communicated to the field. Parks can use this information to develop projects for the Servicewide Comprehensive Call under all fund sources.

The Road Inventory Program (RIP) gathers roadway condition data on cycles, optimally every three years, for all paved routes in the National Park Service. Using this information, a compatible software program, the Highway Pavement Management Application (HPMA) generates a fiscally constrained list of potential projects. Intermountain Region uses HPMA to select most 3R projects. This management system allows the region to step away from a “worst first” funding program to a true asset management program that applies the “right treatment at the right time.” The IMR believes this method to select projects allows the region to maintain its road network in better condition for a longer period of time at the most effective cost by applying less expensive treatments earlier in the life cycle.

In addition to the RIP and BIP, more recent inventories for guardrail/walls and retaining walls have been developed.

The Transportation Program uploads all condition data gathered under the management systems to the National Park Service’ Facility Management Software System (FMSS). Other transportation assets, for example culverts and transit stops, are entered into FMSS allowing comprehensive data management in a single location. Parks are responsible for ensuring the completion of condition assessments and that asset data is accurate. The current level of accuracy of data in FMSS is inconsistent leaving gaps in data that need to be addressed. Data gaps are explored in more detail in Chapter 5.

## **THE SERVICEWIDE COMPREHENSIVE CALL FOR PROJECTS**

The National Park Service uses a method called the Servicewide Comprehensive Call for Projects to select projects for all “soft money” fund sources within the Service. These fund sources include FLTP Category I and Category III, Repair/Rehab, and Line Item Construction. Because the IMR transportation program maintains a robust program of road projects, the FLTP Category I does not participate in the SCC yearly. However, because the regionally managed Category III program is in its infancy, the program does solicit for Category III projects annually. The objective of both programs is to manage a well vetted multiyear program of projects at all times.

## SUSTAINABILITY INITIATIVES

*Executive Order 13423 of January 24, 2007, Strengthening Federal Environmental, Energy, and Transportation Management, establishes the following policy:*

*“It is the policy of the United States that Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.”*

The Intermountain Region has developed a comprehensive sustainability strategy that includes a transportation-related component.

### Key Transportation Elements of the IMR Sustainability Strategy

#### **Enhance connectivity to parks via public transportation and alternative modes of transportation – displace the need for personal vehicles**

- Incorporate all aspects of sustainability into the Long Range Transportation Plan.
- Collaborate with state, county, and community visitor services to let visitors know when and where public or mass transit is available to parks.
- Identify quick, easy connections between parks and gateway communities via alternate modes of transportation.

#### **Establish a policy and structure by which parks can operate and offer employee carpooling and sustainable commuting options**

- Work with solicitors and relative offices to develop guidelines by which parks can establish and operate employee commuter shuttles.
- Increase bicycle paths, parking, and bike share programs.
- Increase and advertise vanpool & carpooling options – maximize incentives.

#### **Strive towards a carbon free fleet**

- Finish fleet inventory program and pilot test results.
- Train staff – 3 course schedule called strategic fleet management.
- Analyze how to choose the appropriate vehicle for each task.
- In-depth training on alternative fuels, vehicles, and infrastructure.
- Review and use fleet data – incorporate GHG emissions.

#### **Research and provide parks with information regarding sustainable transportation & infrastructure**

- Analyze and present scientific research & data on option such as, permeable asphalt, paver stones, difference between hot and cold mix asphalt, bio swales, mitigation techniques for heat island effect, and other topics.

## THE CHALLENGE AHEAD

The Transportation Program has evolved from railroads to roads and transit into a multimodal program. However, the existing Intermountain Region transportation network is still heavily based on visitor access via roadways and will most likely remain that way into the future. The current processes to select road rehabilitation, bridge rehabilitation, reconstruction, and alternative transportation projects is quite sophisticated. The challenge for Intermountain Region is to select projects that cross boundaries and create a seamless multi-modal Transportation Program. Improvements to the process will emerge as this long range transportation plan moves forward into strategic recommendations that will help to make the program transparent, accountable, and efficient.

Other challenges abound. The NPS faces declining and/or uncertain levels of funding, as well as delays and uncertainty related to passage of transportation bills. At the same time, there is greater emphasis on asset management and visitor experience. New initiatives such as the Capital Investment Strategy, NPS Director’s Call to Action, incorporation of the LRTP perspective into programming, transition to performance management, and need for new data collection/analysis, etc. challenge the NPS to efficiently adopt new management practices.

## CHAPTER 3: INTERMOUNTAIN REGION TRANSPORTATION SYSTEM

*“The National Park Service shall promote and regulate the use of Federal areas known as national parks, monuments and reservations by such means and measures as conform to the fundamental purpose of the said parks, monuments and reservations. The purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”*

- NPS Mission Statement

### INTERMOUNTAIN REGION DESCRIPTION

The Intermountain Region of the National Park Service includes the park units in eight states of the mountain west region of the United States. The region stretches from Montana south to Texas and includes Wyoming, Utah, Colorado, Arizona, New Mexico, and Oklahoma. Parks within the region include Historic Trails, National Historic Sites, National Recreation Areas, National Monuments and iconic National Parks like Glacier, Grand Canyon, Rocky Mountain, and Yellowstone.

The Intermountain Region manages approximately 9,857,000 acres (15,400 square miles) of federal lands in 93 units, an area larger than the State of Maryland. The parks range in size from less than one acre of federal land to 2,220,000 acres in Yellowstone National Park. The region oversees 18 National Parks, 36 National Monuments, 10 National Historic Sites, 8 National Historic Trails, 6 National Recreation Areas, 5 National Historic Parks, 3 National Memorials, 1 Wild and Scenic River, 1 National Battlefield, 1 Memorial Parkway, 1 National Preserve, and 1 National Seashore.

Parks within the region were established to maintain and preserve a wide array of natural and cultural features. Parks such as Mesa Verde, Chaco Culture, San Antonio Missions and Fort Laramie preserve the cultural and historic features of Native American tribes and early European settlers in the region. Locations such as Sand Creek, Little Bighorn Battlefield and Oklahoma City preserve the sites of national battles, massacres and tragedies. Recreation areas like Curecanti, Glen Canyon, and Chickasaw provide recreation opportunities, while preserving natural features unique to each area. Areas such as Glacier, Grand Teton, and Rocky Mountain preserve unique animal, plant and geologic features that create large fragile ecosystems. The icons of the region include Grand Canyon and Yellowstone which preserve multiple resources including cultural, historic, wildlife, plants and geology. They also protect some of the world’s most unique physical features such as mile-deep canyons and geothermal features.

The Intermountain Region has a long history of park establishment and preservation. The region is home to the first National Park, Yellowstone, which was established in 1872. Other parks like Mesa Verde, Glacier, Rocky Mountain, and Grand Canyon were established between 1906 and 1919. The region is also home to one of the newest National Park, Great Sand Dunes, established in 2004. The first five National Monuments—Devils Tower, Montezuma Castle, El Morro, Tonto, and Gila Cliff Dwellings—were established in the IMR in 1906 and 1907.



**Intermountain Region Park Units  
 Grouped by Visitation**

**High Visitation (>2 Million)**

Glacier NP (GLAC)\*  
 Glen Canyon NRA (GLCA)  
 Grand Canyon NP (GRCA)\*  
 Grand Teton NP (GRTE)\*  
 Rocky Mountain NP (ROMO)\*  
 Yellowstone NP (YELL)\*  
 Zion NP (ZION)\*

**Medium Visitation (500,000 to 2 Million)**

Amistad NRA (AMIS)  
 Arches NP (ARCH)  
 Bryce Canyon NP (BRCA)\*  
 Canyon de Chelly NM (CACH)  
 Capitol Reef NP (CARE)  
 Cedar Breaks NM (CEBR)  
 Chickasaw NRA (CHIC)\*  
 Curecanti NRA (CURE)  
 John D. Rockefeller, JR PKWY (JODR)  
 Lake Meredith NRA (LAMR)  
 Mesa Verde NP (MEVE)\*  
 Montezuma Castle NM (MOCA)  
 Padre Island NS (PAIS)  
 Petrified Forest NP (PEFO)  
 San Antonio Missions NHP (SAAN)\*  
 Saguaro NP (SAGU)\*

**Low Visitation (<500,000)**

Alibates Flint Quarries NM (ALFL)  
 Aztec Ruins NM (AZRU)  
 Bandelier NM (BAND)  
 Bent's Old Fort NHS (BEOL)  
 Big Bend NP (BIBE)  
 Bighorn Canyon NRA (BICA)  
 Big Thicket NPRES (BITH)  
 Black Canyon of the Gunnison NP (BLCA)  
 Casa Grande Ruins NM (CAGR)  
 Canyonlands NP (CANY)  
 Carlsbad Caverns NP (CAVE)  
 Capulin Volcano NM (CAVO)  
 Chamizal NMEM (CHAM)  
 Chaco Culture NHP (CHCU)  
 Chiricahua NM (CHIR)  
 Colorado NM (COLM)  
 Coronado NMEM (CORO)  
 Devils Tower NM (DETO)  
 Dinosaur NM (DINO)  
 El Malpais NM (ELMA)  
 El Morro NM (ELMO)  
 Florissant Fossil Beds NM (FLFO)  
 Fort Bowie NHS (FOBO)  
 Fossil Butte NM (FOBU)  
 Fort Davis NHS (FODA)  
 Fort Laramie NHS (FOLA)

Fort Union NM (FOUN)  
 Gila Cliff Dwellings NM (GICL)  
 Golden Spike NHS (GOSP)  
 Grant-Kohrs Ranch NHS (GRKO)  
 Great Sand Dunes NP (GRSA)  
 Guadalupe Mountains NP (GUMO)  
 Hovenweep NM (HOVE)  
 Hubbell Trading Post NHS (HUTR)  
 Little Bighorn Battlefield NM (LIBI)  
 Lyndon B. Johnson NHP (LYJO)  
 Natural Bridges NM (NABR)  
 Navajo NM (NAVA)  
 Organ Pipe Cactus NM (ORPI)  
 Palo Alto Battlefield NHS (PAAL)  
 Pecos NHP (PECO)  
 Petroglyph NM (PETR)  
 Pipe Spring NM (PISP)  
 Rainbow Bridge NM (RABR)  
 Sand Creek Massacre NHS (SAND)  
 Salinas Pueblo Missions NM (SAPU)  
 Sunset Crater Volcano NM (SUCR)  
 Timpanogos Cave NM (TICA)  
 Tonto NM (TONT)  
 Tumacacori NHP (TUMA)  
 Tuzigoot NM (TUZI)  
 Washita Battlefield NHS (WABA)  
 Walnut Canyon NM (WACA)  
 White Sands NM (WHS)\*  
 Wupatki NM (WUPA)

**Non-Reporting Units**

California NHT (CALI)  
 El Camino Real de Tierra Adentro NHT (ELCA)  
 Mormon Pioneer NHT (MOPI)  
 Oklahoma City NMEM (OKCI)  
 Old Spanish Trail NHT (OLSP)  
 Oregon NHT (OREG)  
 Hohokam Pima NM (PIMA)  
 Pony Express NHT (POEX)  
 Rio Grande WSR (RIGR)  
 Santa Fe NHT (SAFE)  
 Trail of Tears NHT (TRTE)  
 Yucca House NM (YUHO)

\*Focus Park

**PARK VISITATION CATEGORIES**

Annual recreation visitation at the park unit level ranges from a few thousand visitors to over 4 million visitors. As a result, some analysis in this chapter is aggregated based on park visitation in 2010. Low visitation parks (57 parks), are park units where annual visitation is less than 500,000. Medium visitation (16 parks) indicates between 500,000 and 2 million visitors. High visitation parks (7 parks) welcome over 2 million visitors a year. Thirteen Intermountain Region parks do not report visitation on an annual basis.

**TRANSPORTATION OVERVIEW**

The Intermountain Region maintains approximately 3,227 lane miles of roadway and 37.4 million square-feet (over 61,000 spaces) of parking infrastructure. The roadways range from world-renowned park roads like Going-to-the-Sun Road in Glacier National Park and the Grand Loop Road in Yellowstone National Park to park administration roads used to access employee residences, helipads, and water treatment plants. The parking areas provide vehicle parking at visitor centers, lookouts and viewpoints, campgrounds, park maintenance facilities, and park headquarters.

The region also maintains several Alternative Transportation Systems. These systems range from van and jeep tours, to trams, to van and bus shuttle systems to water transit. Some systems are owned and operated by the National Park Service, others are services contracted by the National Park Service, and a third type of Alternative Transportation Systems is operated through formal NPS partnership. Overall, the Intermountain Region manages six Alternative Transportation Systems; an additional 16 parks provide some type of people movement by a non-NPS business or service.

The region also implements Intelligent Transportation Systems to manage park congestion. These systems range from mobility based systems like fast pass entrance lanes, remote parking with shuttle service, and special event traffic management to information based systems like variable message signs and highway advisory radio.





## INTERMOUNTAIN REGION

### AT A GLANCE

# OF STATES: 8 # OF PARKS: 93 ACRES: 9,857,000

#### ROADWAY/PARKING CONDITION (CYCLE 4)

	PCR	DM	Lane Miles	Area/Spaces
Roadways	79 / FAIR	\$697.3 Million	3227	–
Parking	70 / FAIR	\$11.0 Million	–	37,400,000 SF / 61,280

Replacement Value of All Transportation Assets \$6,696.3 Million

#### OTHER TRANSPORTATION ASSETS

Bridges	168	Major Structural Culverts	30
Tunnels	9	Transportation Signs	17,566

Asset Management

#### CRASHES (1990-2005)

Total	18,769
Injury	2,634
Fatal	68

#### MOST COMMON TYPE OF CRASH

Collision with other vehicle	31%
------------------------------	-----

#### ALTERNATIVE TRANSPORTATION SYSTEM

Number of Systems	6
Annual Boardings	9,193,000

Mobility, Access, & Connectivity

#### VISITATION (2010)

Total Visitors	51,957,000
Non-Recreation Visitors	9,304,000
Recreation Visitors	42,653,000
10-Year Trend	-0.024%

#### BIGGEST VISITOR GROUP BY AGE

- Less than 21 years old (27%)

#### TOP INFORMATION SERVICES

- Park Brochure/Map
- Visitor Center/Exhibits
- Park Newspaper/Photography

#### TOP ACTIVITIES

- Sightseeing/Scenic Driving
- Visitor Center/Museum
- Painting/Drawing/Photography

Visitor Experience

#### RESOURCE PROTECTION

Historic Transportation Assets in Focus Parks	239
No. Parks Affected by Air Quality Non-Attainment Status	6
Total GHG Emissions in Focus Parks	6,415.9 (MTCO2e)

#### TRANSPORTATION/ RESOURCE ISSUES

- see charts starting on page 59

Resource Protection

#### KEY PARTNERS

FLMA	State DOT	National Partners
FHWA	Arizona	National Park Foundation
USFS	Colorado	Association of Partners for Public Lands
USFWS	Montana	Cooperative Ecosystem Studies Units
BLM	New Mexico	University of Idaho
BIA	Oklahoma	Western Transportation Institute
EPA	Texas	National Parks Conservation Association
USCOE	Utah	US DOT Volpe National Transportation Systems Center
	Wyoming	

#### KEY ISSUES

- **Environmental** - Effects of climate change
- **Economic** - Needs greater than financial resources
- **Social** - NPS leadership in a connected community

see Focus Parks for MPOs, gateway communities, & local partners

Sustainable Operations

The region is also implementing multi-use facilities throughout the region. Multiple parks provide paved or unpaved trails available to hikers, bicyclists, and even pets. Several parks also have multi-use connections that provide access to the park from surrounding areas. These facilities provide visitors the opportunity to experience the parks from outside private vehicles or commercial tour buses.

### Key Natural Features & Resources

Parks within the region maintain and protect cultural, historic and natural resources on many different scales. These are a few examples that demonstrate the range of resources across the region.

Type	Park List
Cultural	Mesa Verde NP – Cliff Dwellings San Antonio Missions NHP – Spanish Missions Chaco Culture NHP – Chacoan Cultural Sites
Historic	Oklahoma City NMEM – Oklahoma City Bombing Site Sand Creek Massacre NHS – Sand Creek Massacre Site California NHT, Mormon Pioneer NHT, Oregon NHT – Historic Trails Fort Bowie NHS, Fort Laramie NHS – Frontier Forts Region-wide – Historic Lodges, Structures, and Cultural Landscapes
Natural	Bryce Canyon NP, Devils Tower NM, Zion NP – Unique geologic features Big Thicket NPRES, Padre Island NS, Rocky Mountain NP, Saguaro NP – Wildlife and plant life Glacier NP, Grand Canyon NP, Grand Teton NP, Yellowstone NP – Broad-ranging ecosystems
World Heritage Sites	Chaco Culture NHP, Mesa Verde NP – Cultural Carlsbad Caverns NP, Grand Canyon NP, Yellowstone NP – Natural Waterton-Glacier International Peace Park - Natural

## ASSET MANAGEMENT

The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.7 billion. These assets play a critical role in meeting NPS mission-related goals – to provide access for park visitors. In recognition of that mission, the long range plan established the Asset Management Goal to help ensure that each park unit’s transportation infrastructure is properly planned, managed and maintained. This section of Baseline Conditions examines those assets in detail, describing physical and operational characteristics as they apply to the long range transportation plan.

### Transportation Assets Defined

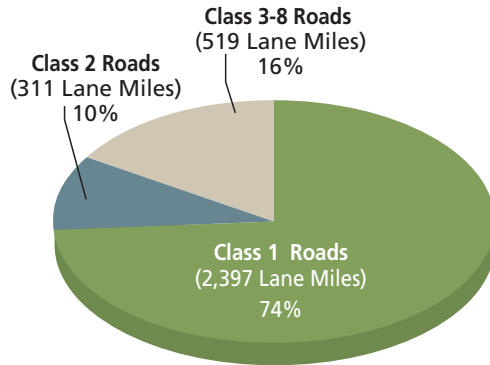
Transportation Asset	Definition
Roadways	The analysis considers Class 1 & 2 Roadways, which are open to public use, and combines Classes 3-8, which consist of secondary, administrative and service roads some of which are not open to public travel. Data sources include the Road Information Program and FMSS. Class 1 and 2 roadways currently receive the majority of roadway maintenance funding.
Parking Areas	Parking areas in this analysis includes public and non-public parking. The NPS records parking area size by square footage. This report uses a conversion factor of 610 sq. ft. per space, including parking circulation and entrance roads, as an average. Data sources include the Road Information Program and FMSS.
Transportation Trails	Transportation trails include routes in which the primary mode of travel is accomplished without the use of motorized equipment and that are integral to the multimodal transportation network, whereas the network would not function without them and the network would be incomplete or impassable. The availability of consistent data at the regional level limited the analysis for this report. See Chapter 5 - Data Gaps.
Bridges and Tunnels	This report includes bridges, tunnels, and other transportation structures such as major culverts designed to support the assets above, as catalogued in the Bridge Inventory Program.
Transportation Signs	Includes directional, regulatory, and warning signs as catalogued in FMSS. This analysis does not include interpretive signage.
Alternative Transportation Systems	The NPS owns or operates five bus/shuttle systems in the Intermountain Region, plus one additional large concession-operated system. This report focuses on these systems. Other smaller concessions and tours also provide service in some parks, but are not included in the detailed analysis.

Data shown on the following pages has been aggregated at the regional level unless otherwise noted.

## ROADWAY ASSETS

### Total IMR Roadway Assets

TOTAL LANE MILES = 3,227



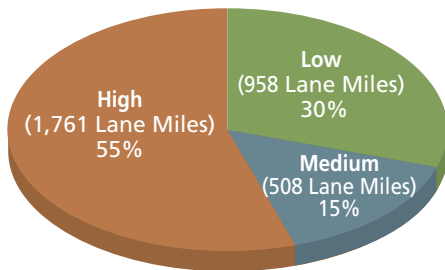
The IMR provides approximately 3,227 lane miles of roadway on 1,011 different routes. Class 1 & 2 roadways account for 84 percent of IMR roadway lane miles.

Fifty-five percent of roadway lane miles are located in the seven high visitation park units. Twenty-nine percent of roadways are located in the low visitation park units.

The following discussion of roadway assets refers to Pavement Condition Rating (PCR) and reflects only the condition of the pavement. It does not account for other factors such as shoulders, culverts, ditches, striping, guiderail, barriers and walls, and signage. Unpaved roads are not included in this inventory.

### Roadway Assets by Visitation

TOTAL LANE MILES = 3,227



Roadway Classification	Description
Class I	Principal Park Road/Rural Parkway. Roads which constitute the main access route, circulatory tour, or thoroughfare for park visitors.
Class II	Connector Park Road. Roads which provide access within a park to areas of scenic, scientific, recreational or cultural interest, such as overlooks, campgrounds, etc.
Class III	Special Purpose Park Road. Roads which provide circulation within public use areas, such as campgrounds, picnic areas, visitor center complexes, concessionaire facilities, etc. These roads generally serve low-speed traffic and are often designed for one-way circulation.
Class IV	Primitive Park Road. Roads which provide circulation through remote areas and/or access to primitive campgrounds and undeveloped areas. These roads frequently have no minimum design standards and their use may be limited to specially equipped vehicles.
Class V	Administrative Access Road. All public roads intended for access to administrative developments or structures such as park offices, employee quarters, or utility areas.
Class VI	Restricted Road. All roads normally closed to the public, including patrol roads, truck trails, and other similar roads.
Class VII	Urban Parkway. These facilities serve high volumes of park and non-park related traffic and are restricted, limited-access facilities in an urban area. This category of roads primarily encompasses the major parkways which serve as gateways to our nation's capital. Other park roads or portions thereof, however, may be included in this category.
Class VIII	City Street. City streets are usually extensions of the adjoining street system that are owned and maintained by the National Park Service. The construction and/or reconstruction should conform with accepted engineering practice and local conditions.

Source: Park Road Standards, National Park Service, 1984

Note: Only Class I and II are eligible for Federal Lands Highways Program (FLHP)

## ROADWAY PAVEMENT CONDITION RATING (PCR) .....

Class 1 & 2 roads, which are most used by visitors, have average PCR ratings of 82 and 80, respectively, on a 100 point scale. All other roadway classifications (Classes 3 through 8) have an average PCR of 69, fair. Of Class 1 & 2 roadways, 8 percent (224 lane miles) are in excellent (PCR 95-100) condition and 55 percent (1,457 lane miles) are in good (PCR 85-94) condition. The overall Class 1 & 2 condition is fair (PCR 61-84).

Roadway Type	Average PCR*
All Roadways	79 - FAIR
Class 1	82 - FAIR
Class 2	80 - FAIR
Class 3 to 8	69 - FAIR

\* Cycle 3 to 5 RIP Data

Low and medium visitation parks have an average roadway pavement condition of fair. The roadways in the IMR's seven high visitation parks have fair average pavement conditions. Six of the seven high visitation parks are focus parks. It is important to consider that not all parks have jurisdiction over the roads within their boundaries whose maintenance may be provided by the local jurisdictions. In general, NPS tries to use visitation levels to guide the funding of appropriate treatment at the correct time. The Small Park Initiative makes additional funds available to small parks and uses condition data to select projects.

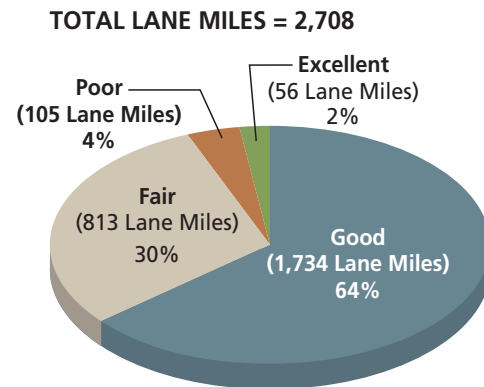
Only Class 1&2 roads are eligible for FLTP.

Visitation Level	Average PCR*
Low	81 - FAIR
Medium	80 - FAIR
High	81 - FAIR

\* Cycle 3 to 5 RIP Data

## CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR) .....

Approximately 2,708 lane miles of roadway are defined as Class 1 or 2 roads (84%). Thirty percent of roadway pavement classified as Principal Park Road (Class 1) or Connector Park Road (Class 2) within the region is rated as fair. Sixty-six percent (1,790 lane miles) of Class 1 & 2 roadways have a good or excellent condition.

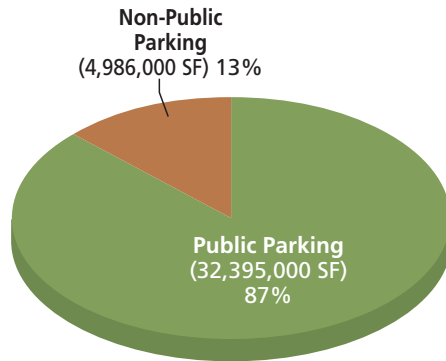




## Parking Assets

### Total IMR Parking Assets

TOTAL SQUARE FEET = 37,381,000

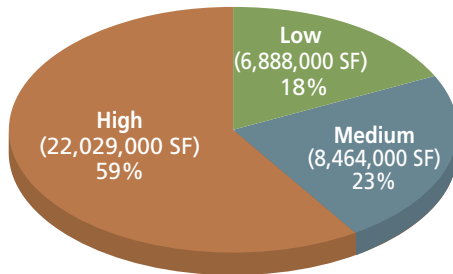


The IMR provides approximately 37,381,000 square feet (61,280 spaces) of parking area in 1,782 identified parking areas. Approximately 87 percent of the parking facilities in the region are classified as public; while the remaining 13 percent is non-public. Unpaved parking areas are not included in this inventory.

*\*For planning purposes, this report uses an average 610 square feet per parking space, to include vehicle access and circulation areas.*

### Parking Assets by Visitation

TOTAL SQUARE FEET = 37,381,000



High visitation parks provide 59 percent of parking assets within the region. Low visitation parks provide approximately 18 percent of parking area.

### Parking Asset Classifications

Public		Non-Public
Visitor Centers	Information/Kiosk Parking	Administration Headquarters
Shuttle Parking	Campgrounds	Employee Housing
Trailheads	Comfort Stations	Maintenance Areas
Hotels/Lodges	Turnouts	Service Roads
Lookouts	Boat Ramps	Employee Parking
Named Parking Lots	Entrance Stations	Fire Stations
Gas Stations	Ranger Stations	
Shuttle Stops	Dump Stations	
Entry Signs/Pullouts	Picnic Areas	
Overflow Parking Areas	Unnamed Parking Areas	

## PARKING PAVEMENT CONDITION RATING (PCR)

Parking assets are currently rated to be in similar condition as roadway assets, although with a lower average PCR. The average PCR for parking and roadway conditions is rated as fair. The average PCR for public and non-public parking is consistent at a regional level.

Parking assets are in fair condition for all visitation levels. There do not appear to be any disparities in parking condition based on park visitation.

Parking Type	Average PCR*
Public Parking	71 - FAIR
Non-Public Parking	65 - FAIR
All Parking	70 - FAIR

\* Cycle 3 to 5 RIP Data

Visitation Level	Average PCR*
Low	74 - FAIR
Medium	69 - FAIR
High	69 - FAIR

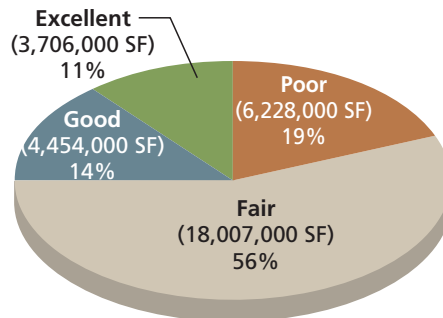
\* Cycle 3 to 5 RIP Data

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

The average PCR for public parking assets is fair. Twenty-five percent of public parking areas are in good or excellent condition.

Region-wide, public parking areas provide approximately 3,706,000 square feet (6,075 spaces) of parking in excellent condition, 4,454,000 square feet (7,300 spaces) in good condition, and 18,007,000 square feet (29,520 spaces) in fair condition. The remaining 6,228,000 square feet (10,210 spaces) are in poor condition.

TOTAL SQUARE FEET = 32,395,000



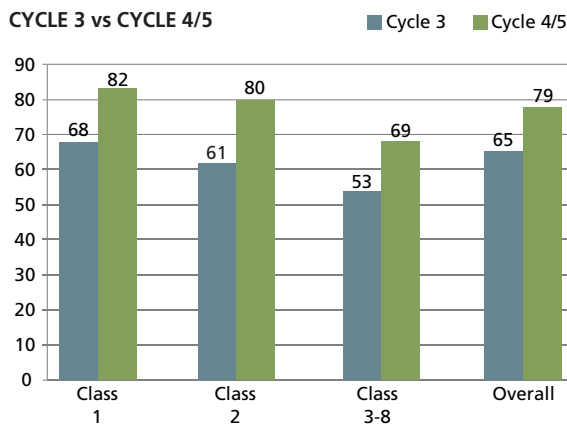
## ASSET CONDITIONS OVER TIME

A comparison of Cycle 3 and Cycle 4/Cycle 5 asset data provides a snapshot of the conditions of the 12 Focus Park assets over time. Between 2006 and 2012 the average roadway pavement conditions within the region improved from 65 to 79. The average parking pavement conditions degraded from a PCR of 76 to 70. Class 1 & 2 roadways experienced substantial improvements in average condition. All parking classifications degraded in average condition.

The Park Roads and Parkways Program has a defined goal of reaching an overall Pavement Condition Rating of 85 by 2015. The comparison of Cycle 3 and Cycle 4/5 data indicates this goal may be achievable. Current funding levels have increased average PCRs to the low 80s. However, an increase in parking funding would be necessary to achieve an average PCR of 85.

### Roadway Conditions

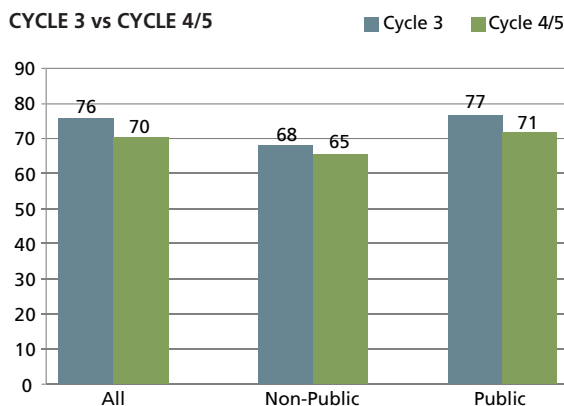
### ROADWAY



Average pavement conditions improved for all roadway classifications. In Cycle 4/5 roadways are in fair condition with Class 1 & 2 roadways approaching good condition. The overall average pavement condition for all assets is similar to Class 1 & 2 roadway conditions.

### Parking Conditions

### PARKING



Average pavement conditions degraded from Cycle 3 to Cycle 4/5 for all parking classifications. All parking areas have an average condition of fair in Cycle 4/5. The overall average condition for all parking in the region is very similar to the average condition of public parking.

## TRANSPORTATION TRAILS

Transportation Trails provide non-motorized travel that is integral to a park transportation network. IMR Transportation Trails are paved, distinct multi use trails that provide an alternative method of access to front country facilities. They are distinctly connected to and work with existing transit, road and parking lots. Transportation trails often connect to trailheads. *Trails from parking lots to overlooks and places of interest, i.e. to beaches, arches, geysers or historic features are not transportation trails in IMR.*

This LRTP pilot plan focuses exclusively on high level Transportation Trails, which include a limited set of separated multi-use paths that connect visitor centers, parking areas, shuttle stops, viewpoints, or other heavily used locations. These trails help the transportation system function efficiently, making multi-modal connections more user friendly. This category of trail is new to the system and work to comprehensively identify the complete inventory is in progress. To date, ten of these high level, high use trails have been identified in the 12 focus parks. The following table shows data as available from FMSS as of date of publication. Future LRTP updates will include additional information, as available.

IMR Transportation Trails

Trail Name	DM	CRV	API	FCI	Rank	Multi-use or Ped Only	Access to Transit
BRCA Rim Trail	\$0	\$6,040,007	93	0.000	Good	Ped	Yes
CHIC	none	-	-	-	-	-	-
GLAC Apgar Bike Trail Apgar Transit Center Bike Path	\$63,221 FMSS data not available	\$1,676,288	88 -	0.038 -	Good -	Multi -	Yes -
GRCA Hermit Road Greenway Visitor Center to Train Depot (S. Rim Trail)	FMSS Multiple Segments FMSS Multiple Segments		- -	- -	- -	- -	Yes Yes
GRTE The Pathway (Park Entrance to Jenny Lake)	\$213,300	\$13,853,446	60	0.015	Good	-	Yes
MEVE	none	-	-	-	-	-	-
ROMO	none	-	-	-	-	-	-
SAAN Mission Trail	(owned & maintained by City/County – eligible for TRIP/CMAQ)					Multi	Yes
SAGU	none	-	-	-	-	-	-
WHSA	none	-	-	-	-	-	-
YELL	none	-	-	-	-	-	-
ZION Grotto Pa'rus	\$16,703 \$194,467	\$237,022 \$2,218,974	67 36	0.070 0.088	Good Good	- -	Yes Yes
Focus Park Total	\$560,932	\$24,546,388	71	0.059	Good	-	-

## Recreational Trails

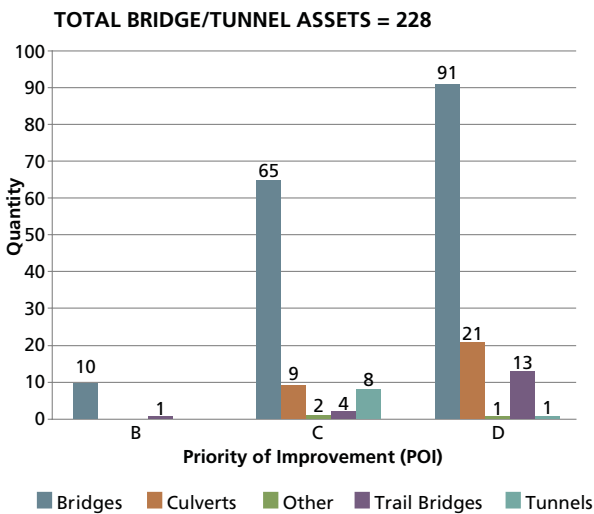
Recreational trails will be more completely integrated into the LRTP process with the first update, pending policy guidance. The region contains many trails in parks including transportation, recreational, and water trails. Recreational trails include both front country and back country trails that provide access to scenic and backcountry destinations.

Many regional and national trails traverse long distances and serve to connect parks with a larger trail network. For example, the American Discovery Trail crosses the country from California to Delaware and provides access to several parks in Utah and Colorado including Capitol Reef National Park, Canyonlands National Park, and Colorado National Monument. The Arizona Trail traverses north-south across Arizona and through Grand Canyon National Park along the North and South Kaibab Trails. The Continental Divide Trail connects from Mexico to Canada through the Rocky Mountain region, including through Montana, Wyoming, Colorado and New Mexico and links Glacier, Yellowstone, Rocky Mountain, and El Malpais. These trails will be more fully documented in the first LRTP update.

Water trails are a new trail type being identified at the national level. These trails cross a body of water and currently are not fully identified with navigational signs. This new trail designation will be documented and included in future plan updates. Examples of water trails within the region include canoe/kayaking routes across Yellowstone Lake and on Jenny Lake in Glacier.

## BRIDGE AND TUNNEL ASSETS

### Bridge and Tunnel Asset, Quantity and Condition



The region maintains and operates numerous structures, including 168 bridges, 30 major structural culverts, 9 tunnels and 3 other structures (stream crossings and retaining walls). Ten bridges have a POI of B indicating the structures have near-term maintenance needs. All 10 of these bridges have been programmed for improvements to bring to an acceptable level of performance. All of the remaining structures have a POI of C or D indicating the structures have no immediate or urgent maintenance needs.

### POI Grade Definition

A	The structure is critically deficient and requires replacement as soon as possible
B	The structure has serious deficiencies but can remain in service with frequent inspections and/or reduced loads
C	The structure is structurally sound and capable of carrying legal loads but is functionally obsolete or requires a high degree of maintenance to prevent a serious deficiency
D	The structure is structurally sound and capable of carrying legal loads

*Draft LRTP Baseline Conditions and Trend Analysis Report, 2010*

## TRANSPORTATION SIGN ASSETS

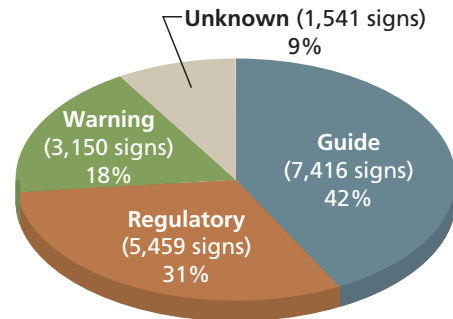
Intermountain Region roadways and parking areas contain 17,566 transportation signs. Approximately 42 percent of the signs are guide signs meant to direct visitors to the desired destinations. Forty-nine percent of the signs are regulatory and warning signs. The remaining nine percent (1,541 signs) are of unknown type since the signs are either missing or unreadable.

With over 1,500 missing or unreadable signs, the validity of the recorded conditions is questionable. The sign inventory should be updated during the next planning cycle.

Condition	Quantity
Good	17,341
Fair	114
Poor	111

### Sign Asset Quantity and Condition

TOTAL SIGNS = 17,566



## ALTERNATIVE TRANSPORTATION SYSTEM ASSETS

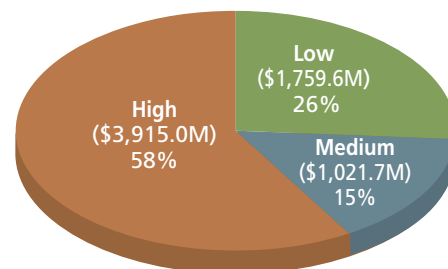
Assets associated with Alternative Transportation Systems are not currently managed in the FMSS system. Some transit shelters are recorded as “buildings” in FMSS, but a majority of these assets are not tabulated with other transportation assets. Additional detail on ancillary ATS assets such as bus shelters, benches, and other associated infrastructure was extracted from detailed pro forma for the six major systems and is included as available in Chapter 4 – Focus Parks.

## TRANSPORTATION ASSET CURRENT REPLACEMENT VALUES

The IMR currently maintains \$6.7 billion in transportation assets. The seven highest visitation parks, including Glacier, Grand Canyon, Grand Teton, Rocky Mountain, Yellowstone, and Zion account for 58 percent of the IMR’s assets. The 16 medium visitation parks provide 15 percent of the region’s assets. The remaining 26 percent of transportation assets are distributed among the 57 low visitation parks.

### Current Asset Value by Visitation

TOTAL ASSET VALUE = \$6,696.3M



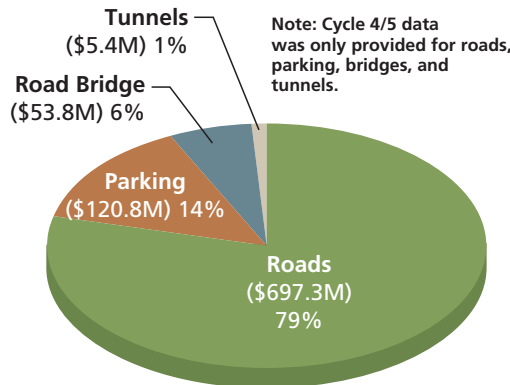


## ASSET DEFERRED MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed as scheduled, or has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

### Deferred Asset Maintenance

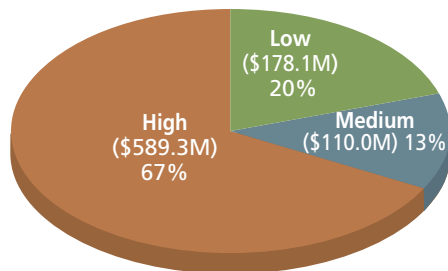
TOTAL DEFERRED = \$877.3M



- Deferred maintenance within the IMR totals \$877 million.
- Over three-quarters (79%) of deferred maintenance is associated with park roadways.
- Parking deferred maintenance is approximately 14 percent.
- The Facility Conditions Index (FCI) for the IMR is 0.131, which indicates fair overall asset condition.
- High visitation park units account for approximately 67 percent of deferred maintenance. These parks maintain 58 percent of current assets, indicating transportation assets in these seven parks tend to be in worse-than-average condition.
- Medium and low visitation parks each account for 20 percent or less of regional deferred maintenance. These proportions are consistent with the value of transportation assets in each group.
- Cycle 3 data also included \$135 million in trail deferred maintenance. Trail data was not provided for Cycle 4/5.

### Deferred Maintenance by Visitation

TOTAL DEFERRED MAINTENANCE = \$877.3M



## TOTAL COST OF OWNERSHIP

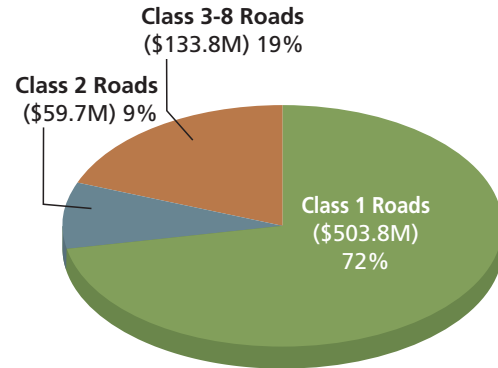
Asset management is not just the process of building or providing transportation infrastructure, like shuttle systems. With the reduced level of funding available for transportation aspects of park units, the total cost of ownership approach is now the basis of asset management. Total cost of ownership includes all construction and maintenance costs for physical assets, as well as the operation costs of Alternative Transportation Systems, the costs of removing obsolete assets, and potential indirect costs such as resource impacts. This approach to asset management is intended to better determine the total cost and economic value of a transportation investment. The Needs Analysis phase will estimate total cost of ownership to 2035 for all facilities and operations.

## ROADWAY DEFERRED MAINTENANCE

- Roadway deferred maintenance in the region totals \$697.3 million.
- 72 percent of roadway deferred maintenance in the region is associated with Class 1 roadways.
- The roadway DM proportions are consistent with the number of lane miles of each roadway classification, with roadways with Classification 1 averaging most deferred maintenance per lane mile.
- Approximately 66 percent of roadway deferred maintenance is associated with high visitation parks. This is a much higher percentage of deferred maintenance compared to total roadway lane miles in high visitation parks, indicating roadways in high visitation parks may have worse than average conditions.
- Low visitation park units account for 22 percent of roadway deferred maintenance. This is a lower percentage compared to total roadway lane miles in low visitation parks, indicating roadways in low visitation parks may have better than average conditions.
- When deferred maintenance is calculated on a per lane mile basis, the IMR averages approximately \$216,000 in DM per lane mile. Roadway assets in low and medium visitation parks have the lowest DM per lane mile at \$163,000. High visitation parks have an average DM of \$261,000 per lane mile indicating worse maintenance conditions in the seven high visitation park units.

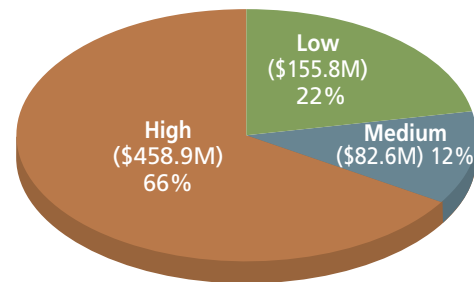
### Deferred Roadway Maintenance

TOTAL DEFERRED = \$697.3M

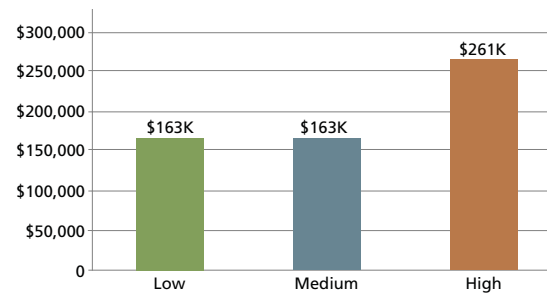


### Deferred Roadway Maintenance by Visitation

TOTAL DEFERRED MAINTENANCE = \$697.3M



### Roadway Deferred Maintenance per Lane Mile by Visitation



## NPS Capital Investment Strategy

The NPS has established the National Capital Investment Strategy (July 2012)(CIS) to help prioritize asset investments and asset management for the National Park Service. Based on Asset Priority Index (API) and Facility Condition Index (FCI) scores, some roadway and parking assets may be candidates for removal. The National Park Service also uses PCR data to assess the usability of transportation assets. The two methods provide different looks at infrastructure condition. The CIS policy can be used as a tool to evaluate the usefulness and on-going maintenance costs of under-utilized facilities or those in poor condition to help determine if, and which, facilities might be decommissioned or otherwise repurposed.

### *Asset Optimization*

Optimization is a triage framework in the CIS to allocate limited operations, maintenance, and project dollars. High-priority assets in good condition should receive priority operations and maintenance funding, particularly preventive maintenance, to keep them in good condition; low priority assets in bad condition should be disposed entirely; high-priority assets in poor condition should be targeted for repair. Assets are assigned to an optimizer band based primarily on two default factors: (1) the asset rating on the park's API, and (2) the condition of the asset, as measured on the facility condition index (FCI). However, parks can apply additional discretion in assigning locations to optimizer bands based on local maintenance priorities - *National Capital Investment Strategy* (July 2012).

The following table describes the anticipated use of optimizer bands. This information may be useful in the Needs Assessment phase of the long range transportation plan. However, the method is developed primarily to aid in project selection and prioritization, rather than the development of programmatic long range plans.

**Capital Investment Strategy Optimizer Bands**

Band	Priority Level	Definition
Band 1	Highest Priority Assets	Critical to the operations and mission of the park or have high visitor use; require highest base funding
Band 2	High Priority Assets	Very important to park operations; require significant base funds
Band 3	Medium Priority Assets	Important to park operations and mission; require some base funding
Band 4	Low Priority Assets	Less important, but valuable for park operations and mission
Band 5	Lowest Priority Assets	Assets not required for the operations and mission of the park, such as inactive assets, or those fully maintained by partners. These assets are often in poor condition. Many are good candidates for disposal

### *Candidates for Disposal*

It should be noted that the removal, or decommissioning of assets demonstrate cost savings in long term maintenance and in mitigation of resource impacts through footprint reduction. However, those benefits must also be weighed with the actual cost of removal, resource impacts from removal projects, and park management strategies. Short of facility removal or decommissioning, other options may be available – maintaining at a lower standard, “mothballing,” or made inactive. Additional consideration should be given to how a low rated asset fits into an overall system. It may rate low on its own but be very valuable to how the system operates efficiently. This issue will be further addressed during the Needs Assessment phase of the IMR Long Range Transportation Plan.

## MOBILITY, ACCESS, AND CONNECTIVITY

The role of transportation in national parks, and in the Intermountain Region, has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. The region also provides multiple alternative transportation systems (ATS) that range from trams, to water transit, to large shuttle systems. Non-motorized transportation routes such as trails and multi-use paths also provide connectivity within park units. Select park units also have available limited airport and rail services.

Not all facilities that serve to connect the region and the nation to the parks are owned or operated by NPS. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Some pieces of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

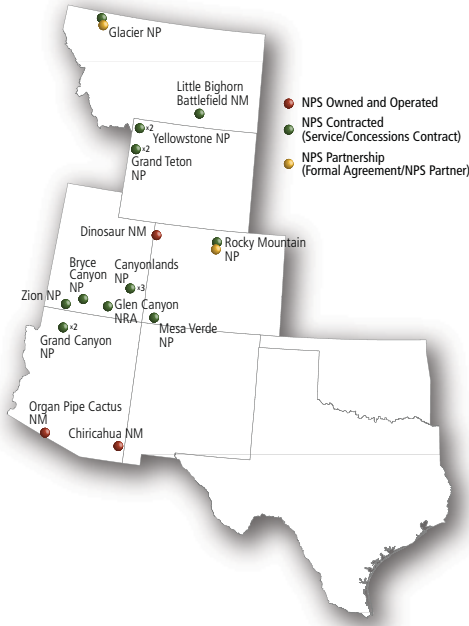
According to the latest National Park Service Comprehensive Survey of the American Public \*, the vast majority of visitors traveled by car, truck, or SUV (84%); however, 15% also traveled by plane on a portion of their trip. Of those who went by car, truck, SUV, or RV, 15% used a rental vehicle during at least a part of their trip. While alternative modes play an important role in park visitation, it is clear that the LRTP must address traditional car travel as the dominant mode.

In the same survey, 38% of visitors said that the most important thing the NPS could do to encourage them to visit more frequently would be to advertise, publicize, and provide more information. This simple fact points to the need to evolve more effective forms of communication. The steps some parks are taking in this direction are further documented in this section.

*\* Taylor, Patricia A., Burke D. Grandjean, and Bistra Anatchkova. 2011. National Park Service comprehensive survey of the American public, 2008–2009: National Technical Report. Natural Resource Report NPS/NRPC/SSD/NRR—2011/295. National Park Service, Fort Collins, Colorado.*

## ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

### IMR ATS Systems



The Intermountain Region owns, operates, maintains, and contracts multiple ATS in several park units. Fifteen IMR park units currently provide NPS contracted ATS service. These services are provided in multiple forms. Some systems are NPS owned and operated while the majority are NPS concessionaire services that are for-profit business endeavors. A third type of ATS includes NPS partnerships where a formal agreement allows a partner to provide services.

The Intermountain Region has five NPS owned and operated systems, sixteen contracted services and two partnership systems, equaling twenty-three total systems. The services include bus, van and water transit as well as tram, van, and jeep tours.

Based on the latest ATS Pro Forma and previous baseline conditions ridership data, the major ATS systems in Bryce Canyon, Glacier, Grand Canyon, Mesa Verde, Rocky Mountain, and Zion serve over 9 million boardings annually. A visitor may “board” a shuttle multiple times in a single visit.

IMR Major ATS Operating Statistics

Park	Annual Boardings*	Service Hours	Service Miles	Alternative Fuels <sup>7</sup>
BRCA	980,000 <sup>1</sup>	9,100 <sup>1</sup>	136,000 <sup>1</sup>	-
GLAC	171,000 <sup>2</sup>	13,900 <sup>2</sup>	335,000 <sup>6</sup>	Biodiesel
GRCA	4,775,000 <sup>6</sup>	66,000 <sup>6</sup>	640,000 <sup>6</sup>	Compressed Natural Gas
MEVE	32,000 <sup>6</sup>	850 <sup>6</sup>	8,200 <sup>6</sup>	Propane <sup>8</sup>
ROMO	435,000 <sup>4</sup>	9,900 <sup>4</sup>	126,000 <sup>6</sup>	Biodiesel
ZION	2,800,000 <sup>5</sup>	46,000 <sup>6</sup>	531,000 <sup>6</sup>	Propane

<sup>1</sup> BRCA Phase II ATS Pro Forma

<sup>2</sup> GLAC Phase II ATS Pro Forma

<sup>3</sup> GRCA Phase I ATS Pro Forma

<sup>4</sup> ROMO Phase II ATS Pro Forma

<sup>5</sup> ZION Phase I ATS Pro Forma

<sup>6</sup> MEVE Phase II ATS Financial Analysis

<sup>7</sup> Alternative Fuel Guidelines for Alternative Transportation Systems, 2011

<sup>8</sup> Mesa Verde 2012 Summer Visitor Guide

\* Note: Individual visitors and passengers may board a transit vehicle multiple times.

## AIRPORTS

Multiple park units in the region have adjacent airport facilities that provide private and commercial air service. None of the airports are owned or operated by the National Park Service, but rather by local and regional jurisdictions. All of the airports, except Jackson Hole Airport, are located outside of park unit boundaries. Large international airports provide long range domestic and international commercial flights; providing a NPS visitor gateway is not their primary service. Regional airports typically have fewer commercial flights per day but are closer to NPS units, allowing these facilities to serve as gateways to nearby parks. Local airports provide an opportunity for airplane and helicopter tours of park units, as well as direct air service for visitors.

The Intermountain Region contains one very unique airport, Jackson Hole Airport. This regional airport provides commercial air service to the Yellowstone/Grand Teton National Parks region. The airport is unique in that it lies completely within the Grand Teton National Park boundary. As a result, the airport has a strict noise abatement program helping to minimize noise impacts to the nearby parks.

### IMR Airports



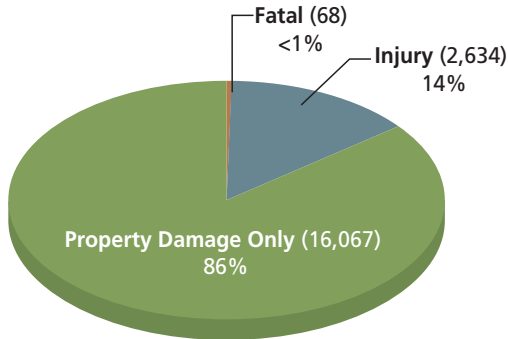
## SAFETY

Safety within the IMR is measured based on crash severity and frequency within the 12 focus parks. Conditions of each crash reported in the focus parks have been consolidated to provide a summary of safety conditions with the parks.



## CRASH SEVERITY

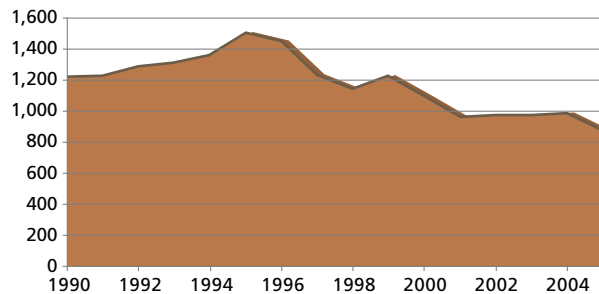
TOTAL CRASHES = 18,769



The 12 focus parks in the Intermountain Region experienced 18,769 crashes between 1990 and 2005. Sixty-eight of these crashes included a fatality and 2,634 included at least one injury. The majority (86%) were property damage only. The rates of fatal and injury crashes were not identified to be higher than expected based on crash experience for similar roadway types in most cases.

## ANNUAL CRASHES

### Annual Crash Totals



The focus parks average approximately 1,173 crashes each year. Approximately 40 percent of these crashes occur in Yellowstone. The focus parks have experienced a consistent decrease in crashes since 1995. The number of annual crashes has decreased by approximately 5.8 percent annually since 1990.

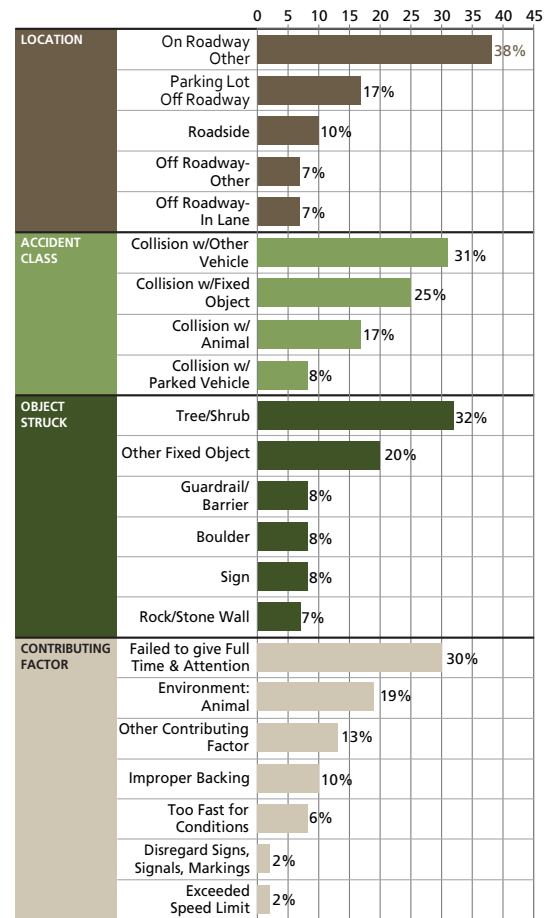
While the focus parks may appear to have a high number of annual crashes, the crash rates within the parks are low as compared to state-wide crash history reported by state departments of transportation.

## CRASH CONDITIONS

Over a third of crashes in the IMR occur on roadways with an additional one in five occurring in parking lots. Most of these crashes are caused by driver inattention and improper backing. Over half of the crashes involve collisions with other vehicles or fixed objects.

About one in five crashes involve an animal. A majority of these crashes occur in Grand Teton and Yellowstone National Parks. Trees and shrubs are the most common objects struck. This may indicate close proximity to roadways and parking areas.

### Regional Crash Conditions



## Congestion and Travel Demand Management

The National Park Service worked with the FHWA to study and develop procedures to manage congestion across the NPS at a system-wide level. Park staff identified multiple congestion mitigation strategies currently used within the region in the 2010 Service-wide Congestion Management System (CMS). Most parks indicated some levels of success in managing localized congestion with these measures. The degree of success tended to vary between parks based on the level of expected congestion reduction. Chapter 4 identifies specific congested locations in focus parks.

Congestion Mitigation Strategy *	Parks Indicating Use of Strategy*
Alternative Transportation Systems (ATS)	BAND, BRCA, GLAC, GRCA, ROMO
Fast Pass	BRCA, ROMO
Manage Special Events	BRCA, FOUN, ROMO, TONT
Remote Parking with Shuttles	BRCA, CAVE, GLAC, GRCA, ROMO, TONT
Worked with local Communities	BRCA, CAVE, GRCA, ROMO
Promoted Bicycle/Pedestrian Access	COLO, GRCA,
Expanded Parking Supply	FOUN, GRCA, ROMO
Changes in Traffic Circulation	GLAC, ROMO, TONT, YELL
* Source: Service-Wide CMS; Phase 1: Emphasis Area Identification, Technical Memorandum 7: Compiled Congestion Survey	

Some parks' responses indicated an expectation of congestion elimination, which in many cases have not materialized or may not be a realistic goal. In many cases complete elimination of congestion would require large-scale expansion of roadway and parking assets, destroying the resources meant to be preserved. Congestion elimination may also entail limiting entrance into a park or specific park area. Expectations at the park level may need to be shifted to understand the inherent persistence of congestion within any congestion management plan. In some cases, congestion may provide necessary physical limitations that ultimately protect the resources of the park.

### Other Mobility, Access and Connectivity System Elements

Many other elements of the transportation system provide mobility, access and connectivity benefits. These elements range from transit service to trails to facilities meant to provide multi-modal connectivity. More information on all modes is provided in Chapter 4.

#### *Transit and Shuttle Systems*

Transit services within the IMR provide access to, within, and between park units. External transit services in San Antonio provide bus transit access to two of the missions at San Antonio Missions. Visitors to both Rocky Mountain and Zion may access the parks from nearby towns without driving personal vehicles. In Springdale, UT, the NPS provides the town with a shuttle route that accesses the park entrance and connects to the park's transit system. In Estes Park, CO, the town provides three shuttle routes that serve the park entrance and connect to the park's transit system.

#### *Rail Service*

Grand Canyon National Park provides concessionaire operated train service from Williams, AZ, to the South Rim Village. Passengers park remotely and enjoy a scenic rail trip to and from the park. Other parks like Chickasaw and Glacier have Amtrak passenger rail service near a park entrance, providing access to the national Amtrak rail network.

### *Water Transportation*

Parks such as Grand Teton and Glacier have large bodies of water that are traversed by ferries and water taxis. These services provide direct access to sections of parks that otherwise are difficult to access by foot, if boats or personal water craft are not available or allowed. Water trails will be addressed in the first LRTP update.

### *Scenic Byways*

Scenic byways sometimes provide for automobile connectivity between many park units. Though not administered by the NPS, scenic byways provide regional connectivity that can enhance the park experience. The following table summarizes scenic byways, national and/or state designation within proximity of the 12 focus parks. These routes have been identified as potential funding opportunities as well as represent important local and regional partnerships.

**Scenic Byways**

<b>Park</b>	<b>Highway #</b>	<b>Designation</b>	<b>Scenic Byway</b>
BRCA	SH12	State, NSB, NFSB	Scenic Byway 12
BRCA, ZION		State, NSB, NFSB	Scenic Byway 143 Utah's Patchwork Parkway
GRCA	US 89/US89 Alt	State	Fredonia-Vermillion Cliffs Scenic Road
GRCA	SH 67	State, NSB, NFSB	Kaibab Plateau-North Rim Parkway
GRCA	Kolob Reservoir Road	State	Kolob Reservoir Road
GRCA		NSB	Historic Route 66
GRCA	Kolob Canyon Road	State	Kolob Fingers Road Scenic Byway
MEVE	SH 62/SH 145/US 160/US 550	State, NSB, NFSB	San Juan Skyway
MEVE	CO-SH 145/CO-SH 184/US 491/CO-County Rd 10/CO-SH 41/UT-SH 262/US 191/UT-SH 95/UT-SH 275/UT-SH 261/US 163/UT-SH 162	NSB	Trail of the Ancients
ROMO	US 36/US 34	NPS, NSB	Trail Ridge Road/Beaver Meadow Road
ROMO	SH 119/SH 72/SH 7	State, NFSB	Peak to Peak Scenic and Historic Byway
SAGU	Catalina HWY	State, NSB, NFSB	Sky Island Scenic Byway
YELL	US 26/US 287/US 89/US 189/US 191	State, NFSB	Wyoming Centennial Scenic Byway
YELL	US 212	USFS, NSB	Beartooth Highway
YELL	US 14/US 16/US 20	USFS, State	Buffalo Bill Cody Scenic Byway
ZION	SH 9/I-15	State	Zion Park Scenic Byway (U-9)

NSB = National Scenic Byway, NFSB = National Forest Scenic Byway, State = State Scenic Byway

### *Grand Circle*

The Grand Circle is a non-profit organization that promotes tourism travel to destinations in the Southwest. The organization makes educational information available to the traveling public through its website (<http://grandcircle.org/>) and other publications. The network includes 12 national parks, 22 national monuments, over 20 scenic byways, and other federal and state recreational destinations.

### NPS Units Along the Grand Circle

National Parks	National Monuments	
Arches National Park (UT)	Aztec Ruins (NM)	Grand Staircase-Escalante (UT)
Black Canyon of Gunnison (CO)	Bandelier (NM)	Hovenweep (CO/UT)
Bryce Canyon (UT) *	Canyon de Chelly (AZ)	Kasha Katuwe Tent Rocks (NM)
Canyonlands (UT)	Canyon of the Ancients (CO)	Natural Bridges (UT)
Capitol Reef (UT)	Cedar Breaks (UT)	Navajo (AZ)
Chaco Culture (NM)	Chimney Rock (CO)	Petroglyph (NM)
Grand Canyon (AZ) *	Colorado Nat'l Monument (CO)	Pipe Spring (AZ)
Great Basin (NV)	El Malpais (NM)	Rainbow Bridge (UT)
Mesa Verde (CO) *	El Morro (NM)	Sunset Crater (AZ)
Pecos Nat'l Historical Park (NM)	Four Corners (AZ, CO, NM, UT)	Walnut Canyon (AZ)
Petrified Forest (AZ)	Grand Canyon-Parashant (AZ)	Wupatki (AZ)
Zion (UT) *		
* Focus park		

### *Bicycle/Pedestrian Access*

Bicycle and pedestrian access within IMR park units has been enhanced in recent years. Parks like Mesa Verde and Yellowstone open roadways and other facilities to bicycles early and late in the season when vehicle travel is restricted. Grand Canyon has introduced bike rental opportunities to promote bicycle use within the South Rim Village area. Many of the large ATS systems including Glacier, Grand Canyon, Bryce Canyon, Rocky Mountain, and Zion provide bicycle racks on buses for transport within the park. Also, these same ATS systems have been designed to provide stops at trailheads allowing for easy pedestrian access. A recent focus for many parks has been connecting parking areas, transit park and ride lots, and visitor centers with trailheads or other facilities.

### *Diverse Visitor Access*

The IMR caters to a wide range of audiences that access parks within the region. Of note is Grand Canyon which is the most visited park in the region and has the highest number of foreign visitors. The park's proximity to Las Vegas provides ample access to international markets. In addition, the changing profile of residents within the region requires the National Park Service to provide access to diverse demographics. Visitor participation by ethnic minorities has always been low and presents an ongoing challenge as they become a larger portion of the regional population. See *Changing America: Macro Trends for Transportation*, October 2012.

### *Multi-Modal Connections*

In most cases, multi-modal connections within parks consist of pedestrian connections between parking areas and trails. These connections occur at visitor centers, park lodges, and trail heads. Parks with ATS services also provide multi-modal connections between transit services and parking areas and/or trails. The most notable gaps in connectivity have been reported in relation to ATS connections. In Zion, the Town of Springdale Shuttle stops about ¼ mile from the Zion Visitor Center where the Zion Shuttle serves passengers. Visitors making this connection are required to walk the ¼ mile across the Virgin River. This reduces the effectiveness of providing a town shuttle to bring visitors to the park entrance. In addition, ATS systems in Bryce Canyon, Glacier, Grand Canyon, Rocky Mountain, and Zion report full buses, which require visitors to wait additional time until seats are available on a following bus.

## VISITOR EXPERIENCE

Maintaining and improving visitor experience is a key focal point of the LRTP. For many visitors, and especially in large parks with scenic landscapes, transportation is the key experience. Whether that experience is enhanced by the view out the windshield or by shuttle services to viewpoints, the LRTP seeks to reinforce the NPS mission to both preserve resources for future generations and provide access for their enjoyment.

This section highlights information the National Park Service collects about visitors and their experience. It points the way with state-of-the art programs and systems that enhance every visit to parks in the Intermountain Region. With over 42.6 million visitors annually, the Region is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in parks. Visitor Experience may be enhanced at three different points:

- trip planning,
- the experience in the park,
- and the creation of memories that last a lifetime.

### Trip Planning

Trip planning is often focused on individual park websites which may include virtual tours, videos, webcams, and park specific trip planners, as well as social media sites making it easier to plan a trip and spend time in meaningful ways. Whether the visit is for a few hours, a single day, or multiple days, such pre-planning is integral to transportation support for visitor experience.

### The Experience in the Park

Visitors come to the parks for many reasons and tend to return if the experience was positive. Transportation can play a key role in that experience, influencing visitors' satisfaction and willingness to visit the park again or plan to visit other parks. Although park visitor studies sometimes evaluate visitors' overall satisfaction with transportation, very little research has investigated how transportation systems influence the dimensions of visitors' experiences in national parks.

Several key elements in the relationship of transportation to visitor experience are noted as important to the basic experience sought by many visitors, including opportunities for cognitive restoration and spiritual development:

- Opportunities to enjoy features of the natural landscape, including scenic beauty, geologic resources, and cultural resources.
- Connection to unique wildlife in a natural habitat.
- Connections to recreational opportunities such as hiking, backpacking, and photography.
- Enhanced sense of personal freedom to explore and connect with park resources.
- The perception of personal freedom is sometimes reflected in available transportation modes, e.g. personal vehicles or transit shuttles, which may enhance, or intrude upon, the experience, depending on the park and the visitor's perspective.

(Concepts from the preceding text were drawn from *Visitor Experiences and Transportation Systems in Yosemite National Park, Final Technical Report*, David D. White, Ph.D., College of Public Programs, Arizona State University, March 2006. The report contains additional analysis that may be of interest to readers.)



## Creation of Memories after the Park Visit

Memories of the experience in the park play an important role in encouraging return visits and future visitation to other parks. If the experience included unwanted congestion, crowding, or a marred landscape, those things may predominate in memory and deter future visits. If the totality of the experience seamlessly allows the realization of the visitors' expectations, then positive memories may be created, without even realizing the extent in which transportation played a supportive role.

## NPS Director's Call to Action

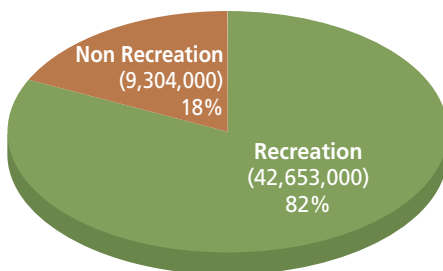
The *NPS Director's Call to Action* (August 25, 2011) provides the agency's vision for improving many aspects of the national parks, including visitor experience. This issue is explored in more detail in *Changing America: Macro Trends for Transportation*, published under separate cover as part of this LRTP, and is further addressed in the *Needs Analysis Technical Report*. The *Call to Action* can be found at [http://www.nps.gov/calltoaction/PDF/Directors\\_Call\\_to\\_Action\\_Report.pdf](http://www.nps.gov/calltoaction/PDF/Directors_Call_to_Action_Report.pdf).

Supporting the visitor experience is so much a part of the NPS role, that it is a central part of the *Call to Action*, whether it be through enhanced interpretive services, or just the right amount of infrastructure support. These every day activities are fully engrained in the agency's day to day work and must be fully supported. Every park employs professionals whose job it is to ensure the appropriate interpretation and presentation of that park's resources. These specialists play a key role in project planning and design and are tasked to help integrate visitor access and enjoyment with the park environment. Park managers must be aware that even the most routine actions, such as roadside mowing, could alter the visitor experience by providing a different perception of the surrounding landscape in a managed vs. natural state. Other more intensive actions should receive equally intensive scrutiny in order to preserve a positive experience.

## 2010 VISITATION

The 93 parks in the IMR saw a total of 42,653,000 recreational visitors in 2010. About 18 percent of the region's total visitation is non-recreational.

**TOTAL VISITORS = 51,957,000**



Non-recreation visits that are reported as public use:

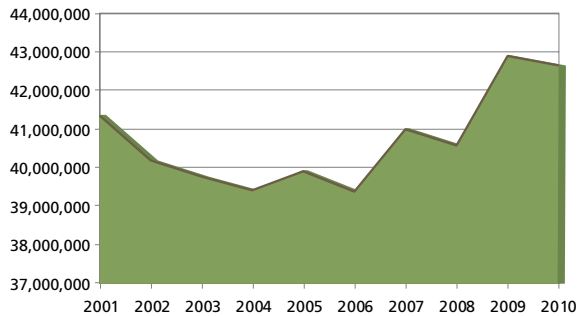
1. Commuter and other through traffic.
2. Persons going to and from inholdings across significant parts of park land.
3. Trades-people with business in the park.
4. Any civilian activity a part of or incidental to the pursuit of a gainful occupation.
5. Government personnel (other than NPS employees) with business in the park.
6. Citizens using NPS buildings for civic or local government business, or attending public hearings.
7. Research activities if independent of NPS's legislated interests and conducted on behalf of the NPS.

Most non-recreation trips are trips through sections of park that are traversed by state and federal highway routes, but are not controlled by entrance gates. Therefore, most non-recreational visits are modeled and not directly counted. The model includes an assumed vehicle occupancy rate that varies by location. Improving park traffic counts and visitor/non-recreational use patterns should be explored during the Needs Assessment. Given the information available about travel patterns, it

is apparent that the large majority of non-recreational trips fall in the commuter and other through traffic category. In some remote locations, park highways provide the only direct route between locations, increasing the reported non-recreation visitation.

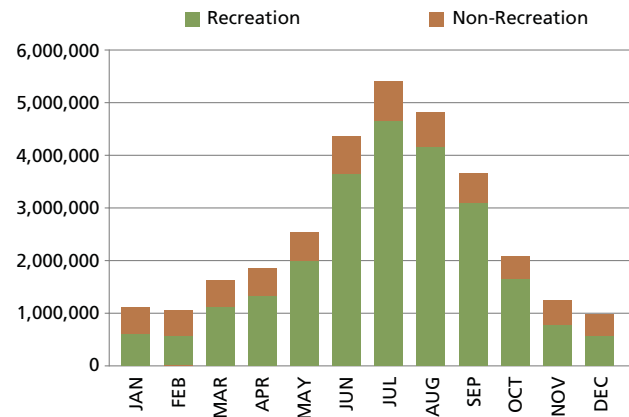
- Visitation has increased by about 0.3 percent on average per year since 2001, but has seen more rapid increases since 2006 (2% per year).
- Non-recreation trips have decreased by about 1.4 percent per year.

**Annual Recreation Visitation (2001-2010)**



- Peak visitation months are June through September – accounting for 60% of annual visits.

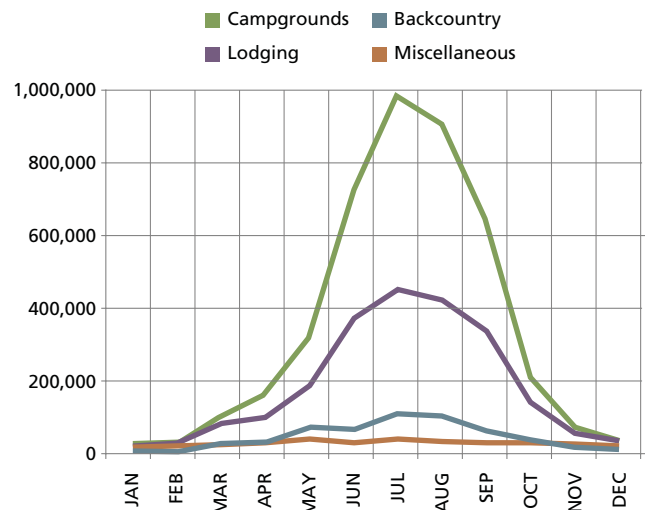
**Visitors By Month**



- NPS lodges and campgrounds account for over 800,000 overnight stays in July and August. Backcountry overnight stays total almost 100,000 in peak months.

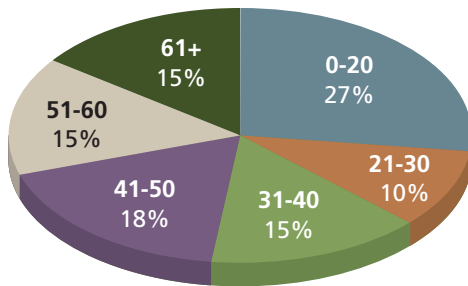
*Note: Visitation numbers are typically estimated based on average vehicle occupancy rates. In many cases these rates have not been updated for years, leaving doubt among IMR managers about the validity of aggregate visitation.*

**Overnight Stays By Month**



## VISITOR AGE

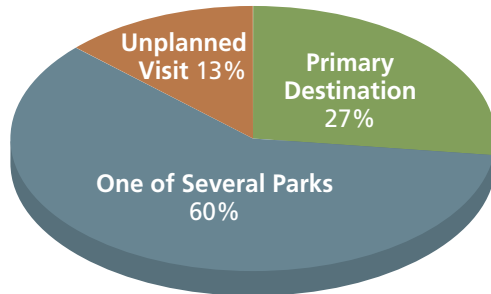
### Visitor Age Distribution



Visitors within the region represent a rather even distribution among age ranges. Over a quarter of visitors are 20 years old or younger. All other age groups represent 10 to 18 percent of visitors. Approximately 9 percent of visitors have an identified disability.

## VISITOR DESTINATIONS

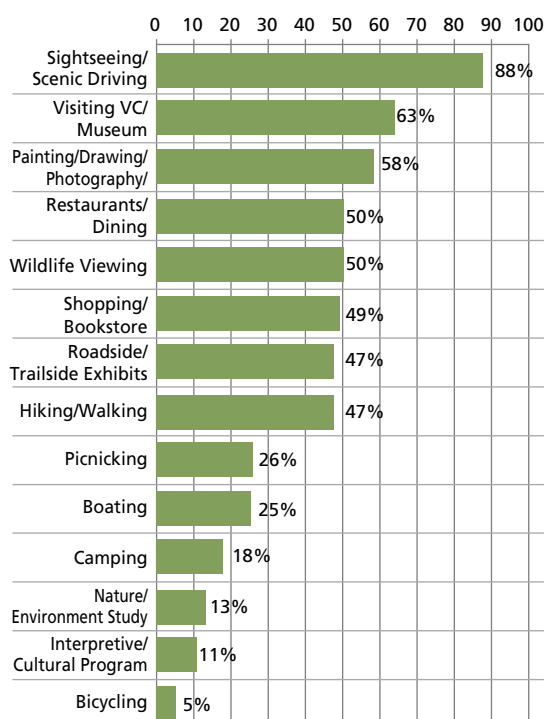
### Planned Destinations



Sixty percent of visitors indicate they visit several parks during one trip. This indicates that park visitors use roads and other facilities to travel between parks on a single trip. About one-quarter of visitors enter only one park as their primary destination. Almost 90 percent of trips within the Intermountain Region are planned trips.

## VISITOR ACTIVITIES

### Visitor Activities



The activities of visitors to the Intermountain Region are wide and varied given the variety of parks within the region. Almost 9 in 10 visitors participate in some form of sightseeing and scenic driving, putting a primary importance on park roadways. A majority of visitors also visit museums and visitor centers, photograph, draw and paint park sites, dine in park restaurants and view wildlife. Nearly half of IMR visitors shop at park bookstores, visit roadway/ trailside exhibits and hike. About one-quarter of visitors picnic and boat. A small minority of visitors in the region camp, bike and participate in interpretive programs.

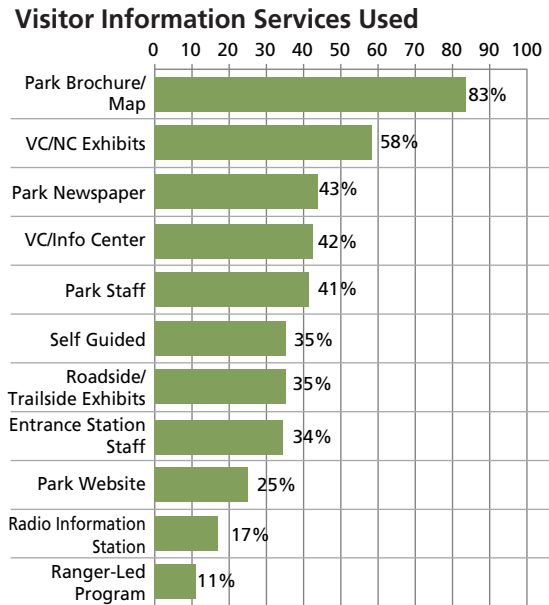
Since driving, visitor centers, museums and restaurants are locations and activities frequented by visitors, these types of areas within each park unit may expect to see increased vehicle congestion compared to other areas of the same park.

## VISITOR INFORMATION SERVICES USED

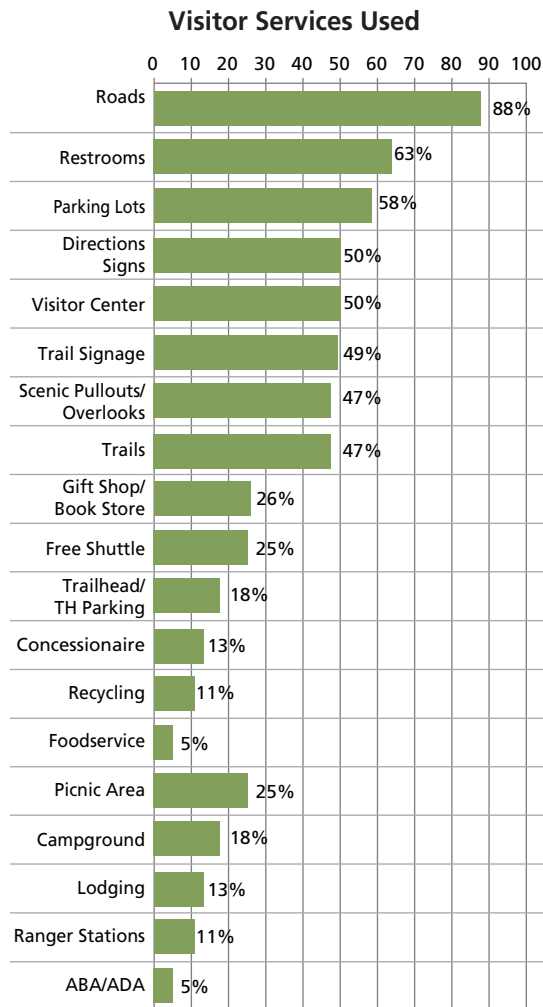
Visitors within the Intermountain Region use a variety of information sources to plan and implement their trips. Not surprisingly, almost 9 in 10 visitors use the park brochure and map provided at the entrance stations to park units. The majority of visitors also use visitor center/nature center exhibits while on their trips. About half of visitors use the park newspaper, visitor enter information and park staff.

About one-third of visitors are self-guided on their trips. A third of visitors also use roadside/trailside exhibits as well as entrance station staff to obtain information. A minority of visitors utilize park websites (25%), with even fewer using radio information stations and ranger-led programs.

The data suggest that visitors tend to use printed information sources like park newspapers and brochures most frequently to access park information. In addition, information sources that are accessible by personal vehicle are also used regularly. With one-third of visitors using entrance station staff as information sources this may cause delays and queues at entrance stations, increasing congestion. While most visits to parks are planned in advance, materials available at the park itself tend to guide activities once in the park.



## OTHER VISITOR SERVICES



The average visitor uses a variety of park provided services. More than 8 in 10 visitors use park roadways, restrooms and parking lots during their visit. This high rate of usage shows a direct link to roadway and parking asset quality and visitor experience.

Directional signs, trail signs, scenic overlooks and trails are additional transportation assets that are used by at least half of regional visitors.

About two-thirds of visitors stop at park visitor centers, indicating potential areas of vehicular and visitor congestion. Almost half of visitors surveyed indicated they use a free shuttle during their park visit. This percentage however is only applicable in parks that provide large-scale shuttle services. About one-third of visitors used trailhead parking. A quarter of visitors use park recycling programs.

Less than one in five visitors use picnic areas, campgrounds, or lodging. Nine percent of visitors have an identified disability. The Architectural Barriers Act (ABA) is the federal land corollary to the Americans with Disabilities Act (ADA). Most park restrooms and visitor centers meet ABA standards in some form.

## VISITOR SURVEYS .....

The National Park Service does not conduct frequent or service-wide surveys regarding visitor experience due in part to cost. However, the National Park Service began working with the University of Idaho Park Studies Unit in 1982 to conduct ongoing research efforts with the Visitor Services Project (VSP). Since 1988, approximately 180 park units nationwide have conducted a VSP survey. A VSP study provides park managers with scientifically accurate information about their visitors. Each park's questionnaire includes basic demographic, common VSP, and park specific questions to best gain usable information that is helpful to the individual park and NPS managers. For example, each park's survey asks the visitor group to rate the quality of common visitor services and facilities and may include facilities unique to that park, such as boat launches or specific gift shops. Not all parks choose to include transportation-related questions on their survey.

Many IMR parks have completed a VSP survey, yet some are outdated and not comparable to recent surveys. Most recently, surveys were conducted at Mesa Verde, White Sands, Chickasaw, and Yellowstone in 2012. Those published reports will be available in 2013.

The following table shows selected results from the most recent published VSP surveys in the IMR focus parks. Perceptions of crowding, poor parking experiences, noise, and directional signage emerged as themes negatively affecting visitor experience. These themes may also be reflected in other parks throughout the region.



**Visitor Services Project Quality Ratings**

Park	Most common activities	(% Very Good and Good)								Detractions/ Negative Visitor Comments <sup>2</sup>
		Overall quality of facilities, services, and recreational opportunities	Roads	Parking areas	Directional signs (in park)	Scenic pull-outs	Trails	Shuttle buses	Boat launches	
BRCA (VSP Summer 2009)	Sightseeing/scenic drive (95%) Photography (90%) Day hiking (70%)	97	NR <sup>1</sup>	86	83	NR	97	NR	NA <sup>1</sup>	Crowding Inclement weather
CHIC (VSP Summer 2005)	Swimming (79%) Hiking/walking (51%) Picnicking(50%)	90	NR	79	80	85	88	NA	91	-
GRCA – South Rim (VSP Summer 2003)	Sightseeing/scenic drive (90%) Self-guided rim walk (68%) Shopping (50%)	92	84	65	76	87	90	85	NA	Parking; poor road directional signs; road construction
GRCA – North Rim (VSP Summer 2003)	Sightseeing/viewing canyon (99%) Walking along rim (84%) Scenic drive/driving tour (64%)	95	90	84	87	81	90	NA	NA	Use shuttle – reduce car traffic; improve directional signs; more parking
GRTE (VSP Summer 2008)	Viewing scenery/scenic drive (77%) Hiking/walking (52%) Viewing wildlife/nature study (42%)	96	79	81	85	92	93	NA	85	Crowded parking at Jenny Lake; crowded boat launch at String Lake
ROMO (VSP Summer 2010)	Viewing scenery (93%) Driving Trail Ridge Road (75%) Wildlife viewing/birdwatching 73%)	95	72	74	84	82	91	90	NA	Crowding Traffic noise
ROMO (VSP Winter 2011)	Viewing scenery (66%) Wildlife viewing/bird watching (45%)Snowshoeing (42%)	95	87	85	82	88	93	NR	NA	Crowding; Noise from vehicles/trucks/ motorcycles
YELL (VSP Summer 2011)	Sightseeing/taking a scenic drive (91%) Viewing wildlife/birdwatching (82%) Boardwalk/geyser basin (78%)	91	NR	NR	92	NR	NR	NR	NR	Parking is inade- quate/more parking needed; road signs inadequate; roads not safe - need wider shoulders
ZION (VSP Fall 2006)	Sightseeing/scenic drive (92%) Short hikes (64%) Shopping (49%)	95	NR	NR	84	89	93	NR	NA	The crowds; lack of parking; road/tunnel construction; traffic

1. NR = not rated. NA = not applicable.

2. Negative comments not necessarily statistically significant

3. Surveys completed recently but reports not yet available for Mesa Verde NP (Summer 2012), White Sands NM (Summer 2012), Chickasaw NRA (Summer 2012), and Yellowstone NP (Winter 2012).

Complete reports and summary reports are available at <http://psu.uidaho.edu/vsp.reports.htm>

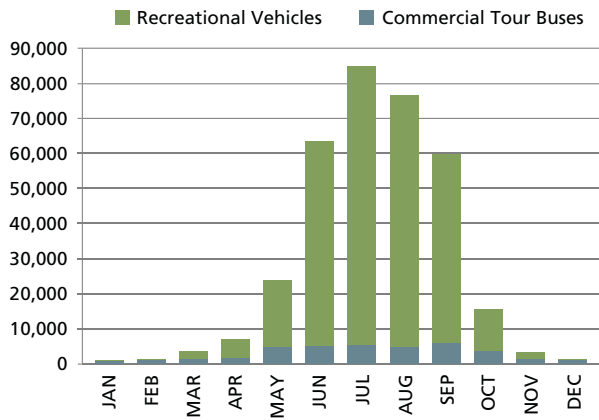
## CONGESTED LOCATIONS .....

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff identified a great many congested locations within IMR park units. Many parks recognized the same types of areas as congested. Thirty-nine park units within the IMR provided responses to the CMS survey. Of those responding, 17 park units indicated congested areas within each park. Based on the responses, the most congested areas tend to be Parking Areas, Park Entrance Stations, Visitor Centers and Trailheads. This information is similar to park visitor surveys which indicate that these types of facilities are most used by visitors.

<b>Congested Areas</b>	<b>Park Units Identifying Area as Congested</b>
Park Access Roadways	HUTR, ROMO, SAGU, TONT, YELL
Other Park Attractions	PAIS, ROMO, YELL
Parking Areas	BAND, BRCA, COLM, DINO, FLFO, GRCA, HUTR, MOCA, ROMO, TONT, YELL
Park Entrance Stations	BAND, BRCA, GLAC, HUTR, PAIS, ROMO, SAGU, YELL
Ped/People Loading Areas	BAND, CARE, FLFO, GLAC, ROMO, YELL
Pedestrian Paths/Trails	CARE, ROMO
Primary Vehicle Tour Routes	CARE, COLM, ROMO, TICA, YELL
Scenic Overlooks	BRCA, CARE, ROMO, YELL
Transit Stops	GRCA, ROMO
Trailheads	CARE, COLM, FLFO, GRCA, ROMO, SAGU, YELL
Visitor Centers	BRCA, CARE, DINO, FLFO, GLAC, LYJO, ROMO, TICA, YELL

## VEHICLE CONGESTION

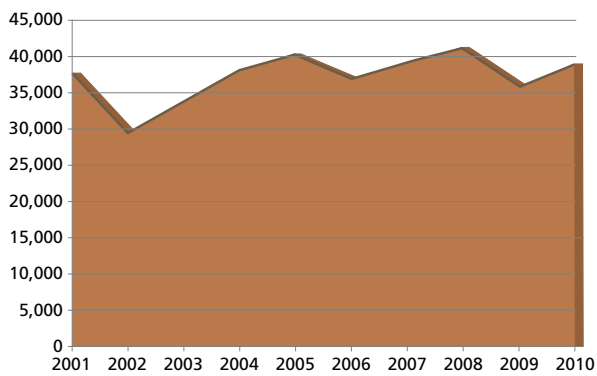
### Commercial Tour Bus and RV Vehicles



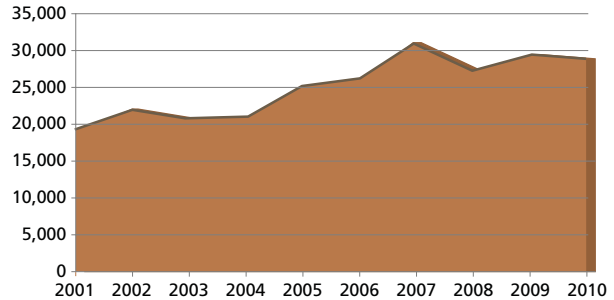
Based on traffic counts at the 12 focus parks, the number of vehicles entering IMR park units has increased slightly (0.26% annually) from 2002 to 2010. The peak month of cumulative visitation for the 12 focus parks in 2010 was July. On a peak visitation day, the focus parks welcome almost 80,000 vehicles, approximately 6,600 per park.

Over 80,000 commercial tour buses and RVs visit IMR focus parks in the busy month of July. During the peak season, RVs outnumber buses by approximately 15 to 1.

### Annual Commercial Tour Bus Volumes



### Annual RV Overnights



The annual number of commercial tour buses entering IMR focus parks has been relatively steady over recent years while the volume of RVs entering the focus parks on an annual basis appears to be increasing.

## Visitor Information Services/Intelligent Transportation Systems

Several ITS congestion mitigation strategies were identified by multiple park units in the 2010 Service-wide Congestion Management System (CMS). Multiple parks use Highway Advisory Radio (HAR), Traffic Information and Variable Message Signs to provide park information. However, the number of parks providing affirmative responses is very low compared to the number of park units in the region.

The *2011 Update on ITS in NPS* report by the Volpe Center identifies the following ITS strategies in use in various IMR parks.

**ITS Implementation in IMR Focus Parks**

	Dynamic Message Signs (portable and permanent)	511 System Integration	Highway Advisory Radio	Trip Planning Tools (Innovative)	Loop Detectors / Traffic Counters	Road Surveillance	Automated Entry System	Automated Fee / Fare Payment	In-Vehicle Electronic Information	Coordinate with Other Agencies	ITS Needs Assessment / ITS Architecture
Bryce Canyon National Park	x	x	x		x	x	x			x	
Grand Canyon National Park	x	x	x	x	x	x	x		x	x	
Grand Teton National Park	x	x			x	x				x	x
Rocky Mountain National Park	x	x	x	x			x	x		x	
Yellowstone National Park	x	x	x		x		x			x	x
Zion National Park	x		x							x	

## RESOURCE PROTECTION

Protecting park resources is a key element in the NPS Mission and a strategic goal for the Intermountain Region and the long range transportation plan. The context sensitive relationship between transportation and the protection of resources is vital to continued success as the stewards of the parks' incomparable legacies. Transportation and its undeniable interface with the natural world must be carefully managed under the terms of the dual mission; while access and visitor enjoyment must be supported, so must be the resources, whether cultural or natural.

The range of potentially impacted resources includes cultural and natural landscapes and their various components: historic and archeological features, geologic resources, vegetation, wildlife, habitats, soils, air quality, water quality, visual resources, and others that may be unique to a single location.

The transportation interface is critical to support each individual park within the context of the resources it manages. For example, even the most routine maintenance practices have the potential to affect resources and must be fully considered. Every park employs resource professionals whose job it is to ensure the appropriate preservation of that park's resources, whether natural or cultural. Those professionals must be routinely consulted about the potential impacts of every action.

This section of Baseline Conditions provides an overview of key resources in the Intermountain Region and discusses the relationships with transportation. Key resources include both natural and cultural/historic resources. Additional cultural resources will be addressed in the first update, including culturally significant maintained landscapes and Cultural Resource Impact Areas.

### Historic Transportation Assets

The following list of potentially significant elements of historic roads illustrates the broad range of things to be considered when planning transportation-related actions. This illustrative list provides a look at the complexity of the process. Trade-offs may often present themselves for analysis, as when a proposed project to mitigate one element has a negative impact on other elements.

#### Potentially Significant Elements of Historic Roads

The overall layout of the road and the way in which it lays gently on the land with minimal resource impact.
The manner in which the topography dictates the design.
The use of cut-and-fill and flat-fill slope operations.
The manner in which the slopes are finished and rounded at the top and bottom.
The shape and width of the road prism.
The gentle curvilinear shapes of the road and the ways in which turn-outs are incorporated
The presentation of specific vistas and vista clearing.
The course of the road over a variety of vistas shows the variety of natural features in the park landscape.
The integration of natural features into the road corridor; the use of tunnels to avoid deep scars to the landscape.
The design of bridges, culverts, tunnel portals, and other features in harmony with the surrounding natural landscape of the park and in harmony with the built environment of the park.
Use of standard-plan guardrails and guardwalls.
Entrance features such as historic gateways and signs that mark the boundary from the outside world.
Rustic road furnishings, such as benches, designed in harmony with the park's natural and built environment.
Vegetation and treatment of it along the road.
The effect of all of the above on the experience of driving the park road.

*The Secretary of the Interior's Standards for the Treatment of Historic Properties, 1995*

Historic roads and bridges in the region include representative cultural resources from periods of infrastructure expansion. Historic roads and other potentially significant properties are generally identified and evaluated for National Register eligibility under Section 110 and 106 of the National Historic Preservation Act. Many historic highways are located in and near NPS park units. As a result of its inland, drier climate, the intermountain west has very few historic bridges in comparison to the number of historic roads.

The term “historically significant” is generally understood to mean roads that have been determined eligible or are listed in the National Register of Historic Places at the local, state or regional level. Only a few park road systems have acquired landmark status—notable among them is the Going-to-the-Sun Road in Glacier National Park. Roads that are considered eligible for listing in the National Register generally enjoy a greater degree of protection than ineligible or unevaluated roads (even if the road is not yet officially nominated and “listed” in the National Register). Under federal law, agencies are required to consider the impacts of their proposed undertakings on properties either eligible or listed in the National Register. Occasionally, parks will decide to treat a road as an historic resource, even if it doesn’t meet the requirements for National Register eligibility.

### *Inventory of Historic Transportation Assets*

A comprehensive regional inventory of historic transportation resources is not complete at this time. All projects and actions must clear the NEPA process during the project development phase, including an inventory of affected historic and cultural resources. In addition to entire routes and bridge structures that are deemed historic in nature, many individual elements of a route or bridge may also be deemed historic.

The National Park Service maintains several databases that document cultural and historic resources. The NPS List of Classified Structures (LCS) authenticate roads and associated features that have been identified by the National Park Service as historically significant. This inventory of historic and prehistoric structures provides the National Park Service with a legal, enforceable basis for protection. The database identifies the name of the property (e.g., road, culvert, retaining wall, parking lot, and bridges), its significance, the NPS legal interest, condition, impacts, treatments, and associated historical events. The NPS Cultural Landscape Inventory (CLI) database may also include road(s) as a component of a larger historic landscape, or the road(s) system may be identified as a landscape by its own merits. The historic nature of these elements adds an additional layer of complexity to the management of the IMR transportation system.

Many of the 12 focus parks contain significant historic transportation resources, including roadways and parking areas. The assets often comprise a substantial portion of total transportation assets and have a corresponding impact to asset management. The following table identifies the percentage of historic roadway lane miles and parking areas compared to the total for the park. IMR focus parks have over 440 miles of historic roadway and over 1 million square feet of historic parking. Over 27% of roadway lane miles in the 12 focus parks are listed as historic, while five percent of parking area is historic. Glacier, Rocky Mountain, and Yellowstone National Parks administer the largest proportion of historic roads, given the roadway lengths and early dates of construction.



**Historic Roadway Lane Miles and Parking Area Compared to Total in IMR Focus Parks**

Park	Roadways					Parking				
	Lane Miles		Total Historic Transportation "Locations"			Area (sq ft)		Total Historic Parking Areas		
	Historic Lane Miles	Percent of Total	Historic	Total	Percent Historic	Historic Parking Area	Percent of Total	Historic	Total	Percent Historic
BRCA	0.74	2%	4	80	5%	0	0%	0.0	46.0	0%
CHIC	13.12	21%	66	142	46%	245,498	26%	35.0	76.0	46%
GLAC	65.13	35%	19	329	6%	11,684	0%	2	193.0	1%
GRCA	6.36	2%	38	394	10%	209,132	6%	20.0	187.0	11%
GRTE	20.72	9%	9	259	3%	0	0%	0.0	111.0	0%
MEVE	24.49	21%	24	136	18%	240,093	18%	14.0	62.0	23%
ROMO	64.26	53%	13	261	5%	36,469	2%	1.0	142.0	1%
SAAN	0.0	0%	0	33	0%	0	0%	0.0	15.0	0%
SAGU	9.13	30%	2	67	3%	0	0%	0.0	43.0	0%
WHSA	0.0	0%	0	17	0%	0	0%	0.0	7.0	0%
YELL	218.29	48%	57	525	11%	229,964	4%	7.0	250.0	3%
ZION	18.28	21%	14	110	13%	82,934	8%	5.0	57.0	9%
Total	440.52	27%	246	2353	10%	1,055,774	5%	84	1189	7%

This pilot LRTP identifies a set of major historic roadway assets that, due to their significance and extent, play a significant role in transportation management. These assets include Class I and Class II roads and associated bridges, tunnels, and parking areas. Culverts, retaining walls, pedestrian-related assets, and other features may also be associated with the roadway, but are not addressed directly in this pilot plan. The following table identifies nine groups of assets in IMR focus parks that are documented with National Register status. The Current Replacement Values of these assets is \$758.5 million. The Deferred Maintenance values total \$69.8 million, approximately 10% of the entire IMR Deferred Maintenance for all roadways.

**Major Historic Transportation Assets in IMR Focus Parks**

Asset	Park	CRV*	DM*	Description
Going-to-the-Sun Road	GLAC	\$202,102,000	\$4,299,000	Road is 48.7 miles long, two lane asphalt paved road crosses over a number of stone faced bridges, through two tunnels, and between a series of stone retaining walls. The Road is significant in the areas of Landscape Architecture, Transportation and Politics/Government. Period of Significance 1921-1952.
Lake MacDonald Lodge Area/Bridge	GLAC	\$427,000	\$20,000	This 20' stone arch bridge is a good example of rustic styling used in Glacier. It contributes to the understanding of recreational development along Lake McDonald. It is significant in the areas of recreation & architecture. The period of significance is 1900 - 1924.
Grand Canyon Village	GRCA	\$4,062,000	\$284,000	These historic roads show auto routes developed in Grand Canyon Village. Routes based on early stage roads. The network of auto roads follow the 1924 Plan by Daniel Hull, Chief Landscape Engineer. The Historic District is significant for America park movement & Landscape Architecture. Period of sig: 1897-1942.

*continued*

**INTERMOUNTAIN REGION**  
**LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT**

**Major Historic Transportation Assets in IMR Focus Parks, *continued***

<b>Asset</b>	<b>Park</b>	<b>CRV</b>	<b>DM</b>	<b>Description</b>
Jackson Lake Lodge Loop & Parking Area	GRTE	\$2,800,000	\$595,000	The Jackson Lake Lodge Main Loop Drive is a large paved loop road which encircles the main parking area, passing turnoffs for the employee housing area, for the cottages, and for the service station/corral zone area before exiting the complex. The loop road connects with Highway 89. The Historic District is significant for Events of National Importance and Architectural Features. The Main Parking Area occupies a central location in relationship to the lodge. It has 750 spaces for private autos and tour buses. The period of significance is 1950 – 1955.
Fall River Road	ROMO	\$11,277,000	\$989,000	Fall River Road is 9.5 miles of gravel road, hairpin turns, and breathtaking views following Fall River to the Alpine Visitor Center. It is significant the road is significant for Transportation History of Rocky Mountain National Park.
Trail Ridge Road	ROMO	\$125,529,000	\$4,626,000	Trail Ridge Road is a two-lane, paved roadway 42.66 miles in length with eleven miles above 11,000 feet and four miles above 12,000 feet. The average width is twenty-four feet and the maximum grade is seven percent. It is significant the road is significant for Transportation.
Yellowstone Main Loop	YELL	\$132,921,000	\$49,543,000	The Grand Loop Road in its entirety is nationally significant under Criterion A as the first large-scale designed national road system. The road is significant for its design. The cluster of historic assets includes numerous historic bridges. Period of Significance: 1875-1949.
Floor of the Valley Road	ZION	\$23,684,000	\$3,689,000	The Floor of the Valley Road is a paved, two-lane scenic park road. The nine mile long road, whose width varies from twenty-two to twenty-six feet, is flanked by towering sandstone cliffs and carefully constructed to blend with the topography and canyon walls. The road is significant for early park transportation development NPS road construction design philosophy. The cluster of historic assets includes several historic bridges and parking areas. Period of significance 1932-1942.
Zion-Mt. Carmel Hwy	ZION	\$255,659,000	\$5,752,000	The Mt. Carmel Hwy is the primary road through the park running approximately 10 miles from the Zion Lodge turnoff to the Park's eastern border, located 1/2 mile east beyond the East Entrance Visitor Contact Station. The road has several features including tunnels, retaining walls, switchbacks, bridges and culverts. The Multiple Resource Area Thematic Group is significant for significant civil engineering challenges. Period of significance is 1925-1949.
Total		\$758,463,000	\$69,797,000	Sum of values for selected components of the listed facility

\*FMSS January 24, 2013

Refer to Appendix D – Historic Roads and Bridges for a listing of historic transportation elements in the 12 focus parks. The condition of individual historic assets will be addressed more completely in the first LRTP update.

### *Treatment of Historic Transportation Assets*

Treatment of historic roads and other significant NPS cultural resources is generally governed by The Secretary of the Interior’s Standards for the Treatment of Historic Properties, 1995, and any specific treatment plans developed at the park level, such as a cultural landscape report. Planning for all construction projects, and even minor maintenance such as snow removal, pothole repair, pavement overlays, and mowing operations should consider potential impacts to cultural resources and viewsheds. All activities on historic assets have the potential to significantly impact costs due to the use of unique materials and construction techniques.

On Federal Lands Transportation Program projects, treatment decisions are made jointly by park staff, typically the facility, roads, and cultural resource managers. Denver Service Center and FHWA team members also participate in treatment decisions. NPS is responsible for completing Section 106 of the National Historic Preservation Act compliance in consultation with the State Historic Preservation Office on these projects.

## Representative Resources and Habitats

The park units within the region protect and preserve a wide array of natural resources. Habitat preservation of a diverse range of habitats is fundamental to preserving at risk plant and animal resources. The 12 focus parks provide a cross-sample of the full range of habitats under the care of IMR parks.

Park	Sensitive Habitat Types to Landscape Stressors *	
<b>Bryce Canyon NP</b> Mixture of High Plateau Woodland and Semi-arid Habitats	White Fir – Spruce-Aspen Forest Bristlecone Pine Stands Montane Meadows/Grasslands	Breaks Communities Pinyon-Juniper Forests Riparian/Wetlands
<b>Chickasaw NRA</b> Mesic Woodland and Prairie Habitats	Eastern Deciduous Forest Tallgrass prairie	Riparian Springs/Seeps/Wetlands
<b>Glacier NP</b> High Elevation Forests and Montane Shrub/Grassland Habitats	Alpine Tundra Subalpine Forest (Whitebark Pine) and Wet Meadows	Montane Cedar-Hemlock and Aspen Forests Montane Grasslands Riparian/Wetlands/Fens
<b>Grand Teton NP</b> High Elevation Forests and Montane Shrub/Grassland Habitats	Alpine Tundra/Meadows Subalpine Spruce-Fir-Whitebark Pine Forests	Montane grassland Sagebrush Steppe Riparian/Wetlands/Marshes
<b>Grand Canyon NP</b> High Plateau and Semi-arid Desert Habitats	Spruce-Fir-Aspen Woodland Montane Meadows/Grassland Pinyon-Juniper Woodlands Gambel Oak Woodland	Semi Desert Shrub-grassland Desert Scrub Riparian/Springs/Seeps
<b>Mesa Verde NP</b> High Plateau Woodlands and Semi-arid to Mesic Habitats	Fir Woodlands Gambel Oak-scrub Woodlands Pinyon-Juniper Woodland	Montane Grassland Riparian/Springs/Seeps
<b>Rocky Mountain NP</b> High Elevation Forests and Montane Shrub/Grasslands	Alpine Tundra/Meadows Subalpine Spruce-Fir Forests Aspen Stands/Forests	Montane Grasslands Riparian/Wetlands
<b>San Antonio Mission NHP</b> Sub-tropic/Semi-arid Gulf Coast Plains Habitats	Oak Savanna Pecan-Sugarberry Forest	South Texas Brush Riparian
<b>Saguaro NP</b> Arid Desert and Semi-Arid Woodland Habitats	Mixed Conifer Forest Pinyon-Juniper Woodland Pine-Oak Woodland	Sonoran Desert Scrub Sonoran Desert Grassland Riparian
<b>White Sands</b> Arid Habitat	Alkali Flats Barchan Dune Communities Parabolic Dune Communities	Saltbrush-Alkali sacaton Mesquite Hummocks
<b>Yellowstone NP</b> High Elevation Forests and Montane Shrub/Grasslands	Alpine Tundra/Meadows Subalpine Spruce-Fir-Aspen Forests Whitebark Pine Stands	Riparian/Wetlands/Springs Geothermal Habitats
<b>Zion NP</b> Mixture of High Plateau Woodland and Semi-arid Habitats	High Plateau Mixed Conifer-Aspen Forests Pinyon-Juniper Forests	Arid Grasslands Desert Shrub Riparian/Springs/Seeps

\* Information obtained from general sources about the parks and may not be all inclusive

### *Habitat Fragmentation*

The Intermountain Region and individual parks are exploring the negative effects of roads, including the fragmentation of natural landscapes and the mortality of animals that are hit by vehicles. Several types of improvements are planned or already in place that enhance permeability for wildlife. While new crossing structures designed specifically for wildlife passage offer the greatest opportunity for reducing the negative impacts of roads on wildlife, such large infrastructure projects are often not financially feasible or constructed in a timely manner, and may carry their own additional environmental impacts.

Hundreds of thousands of culverts and bridges are currently part of the region's transportation infrastructure and may function to pass wildlife under roads. However, such solutions are only partly successful, especially when considering prey animals like deer, which are averse to closed spaces that may harbor predators. Less costly modifications of existing structures can be upgraded to provide safer opportunities for visitors and wildlife alike. The role of roads in habitat fragmentation, both within parks and in a regional context, is addressed more comprehensively in the previously mentioned technical report, *Changing America: Macro Trends for Transportation*, October 2012, as part of the IMR Long Range Transportation Plan.

### *Wildlife Crossings and Migration Routes*

Wildlife are valued resources in most IMR park units. Animals are frequently struck when crossing busy park roads. Transportation impacts to wildlife have been identified as significant issues throughout the region. Several focus parks, including Bryce Canyon, Grand Canyon, and Saguaro, indicate that animal/vehicle crashes endanger both visitors and animals. Parks like Grand Teton and Yellowstone intersect major animal migration routes, putting species at risk during annual migration. These two parks account for the great majority of this crash type within the Intermountain Region.

Wildlife crossings may or may not coincide with annual migration routes, but can be identified as frequently used barriers to animals in their daily cycles between feeding, watering, and sheltering areas. As a result, many parks have identified well-known problem areas with a high number of animal/vehicle crashes occur. Documentation of these dangerous zones is not complete at the regional level and should be explored for future updates. See Chapter 5 for discussion of data gaps.

### *Threatened and Endangered (T&E) Species*

The Endangered Species Act (ESA) outlines procedures for agencies to follow when federal actions may impact T&E species. As required by federal law, the National Park Service evaluates transportation projects for impacts, maintains resource conservation plans and inventories, and consults with the US Fish and Wildlife Service to ensure actions do not jeopardize listed species or critical habitat. The 12 IMR focus parks protect many T&E wildlife and plant species, as shown in the table below. Many other species are likely to exist in other IMR park units and should be catalogued in local plans.

**INTERMOUNTAIN REGION**  
**LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT**

**Threatened and Endangered Species in IMR Focus Parks**

Common Name	Species Name	Listing Category	Park Name *
WILDLIFE			
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Delisted Monitored	SAGU, SAAN, YELL, ZION, BRCA, GLAC, GRCA, GRTE, MEVE
Arctic grayling	<i>Thymallus arcticus</i>	Delisted	YELL
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Delisted Monitored	ROMO, SAAN, YELL, ZION, BRCA, GLAC, GRCA, GRTE, MEVE
Black-Footed Ferret	<i>Mustela nigripes</i>	Endangered	GRCA
Bonytail Chub	<i>Gila elegans</i>	Endangered	GRCA
Brown Bear	<i>Ursus arctos</i>	Threatened	ROMO, SAGU, YELL, ZION, BRCA, GLAC, GRCA, GRTE, MEVE
Bull Trout	<i>Salvelinus confluentus</i>	Threatened	GLAC
Cactus Ferruginous Pygmy-Owl	<i>Glaucidium brasilianum cactorum</i>	Delisted	SAGU
California Condor	<i>Gymnogyps californianus</i>	Occasional	ZION, BRCA, GRCA
Canada Lynx	<i>Lynx canadensis</i>	Threatened	ROMO, YELL, GLAC, GRTE, BRCA (unconfirmed)
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Endangered	YELL, GLAC, GRTE
Desert Tortoise	<i>Gopherus agassizii</i>	Threatened	ZION, GRCA
Gila Topminnow	<i>Poeciliopsis occidentalis</i>	Endangered	SAGU
Gray Wolf	<i>Canis lupus</i>	Endangered	ROMO, SAGU, YELL, ZION, BRCA, GLAC, GRCA, GRTE, MEVE
Greenback Cutthroat Trout	<i>Oncorhynchus clarkii stomias</i>	Threatened	ROMO
Humpback Chub	<i>Gila cypha</i>	Endangered	GRCA
Jaguar	<i>Panthera onca</i>	Endangered	SAGU
Kanab Ambersnail	<i>Oxyloma haydeni kanabensis</i>	Endangered	GRCA
Lesser Long-Nosed Bat	<i>Leptonycteris curasoae yerbabuenae</i>	Endangered	SAGU
Little Colorado Spinedace	<i>Lepidomeda vittata</i>	Threatened	GRCA
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened	ROMO, SAGU, ZION, BRCA (unconfirmed), GRCA, MEVE
Razorback Sucker	<i>Xyrauchen texanus</i>	Endangered	GRCA, MEVE
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Endangered	ZION, BRCA, GRCA, MEVE,
Utah Prairie Dog	<i>Cynomys parvidens</i>	Threatened	BRCA
Virgin Spindace	<i>Lepidomeda mollispinis mollispinis</i>	Delisted	ZION
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	Candidate	ROMO, SAGU, ZION, BRCA (unconfirmed)
Woodland Caribou	<i>Rangifer tarandus caribou</i>	Endangered	GLAC
Yuma Clapper Rail	<i>Rallus longirostris yumanensis</i>	Endangered	GRCA
PLANTS			
Shiowitz Milk-vetch	<i>Astragalus ampullarius</i>	Endangered	ZION
Sentry Milk-vetch	<i>Astragalus cremnophylax cremnophylax</i>	Endangered	GRCA



## Air Quality And Greenhouse Gas Emissions

Most parks do not have direct control over air quality controls affecting the park and must coordinate with the designated regional air quality authority, generally a metropolitan planning organization (MPO) or regional air quality planning commission. Nearby metropolitan areas (and in some cases distant cities or industrial operations) can significantly affect air quality within parks, endangering health, contributing to smog and reducing visibility.

Several areas adjacent to or near parks have been federally identified as non-attainment areas for specific greenhouse gases and other air pollutants. Non-attainment areas must plan for reduction of air pollutants like carbon monoxide, ozone, airborne particulate matter, and sulfur dioxide and include those plans in the regional long range transportation plan. Regional air conformity determinations are based on aggregated modeling for the entire region.

Long range plans and emissions must be modeled to bring the region into compliance with air quality regulations. Park units within or near these areas may be eligible for federal Congestions Mitigation and Air Quality Improvement (CMAQ) funds to help achieve or maintain National Ambient Air Quality Standards (NAAQS). Qualifying parks work directly with regional planning agencies to determine appropriate actions.

### Air Quality Non-Attainment Status of IMR Parks and MPOs

Nonattainment Area	Criteria Air Pollutant and Status	Affected Park Units
Flathead County	Particulate Matter 10 (PM-10) Moderate	GLAC
Las Vegas/Clark County, NV	8 Hour Ozone – Marginal PM-10 – Serious	GRCA LAME
Denver-Boulder-Greeley-Ft Collins-Loveland, CO	8 Hour Ozone – Marginal	ROMO
Pinal County, AZ	8 Hour Ozone - Marginal PM 10 - Moderate/Serious PM 2.5 - Non-attainment Sulfur Dioxide – primary	SAGU
Pima County, AZ	PM-10 – Moderate	SAGU
Santa Cruz County, AZ	PM-10 – Moderate PM-2.5 - Nonattainment	SAGU
Las Cruces/Dona Ana County, NM	PM-10 – Moderate	WHSA

Source: <http://www.epa.gov/oaqps001/greenbk/anc1.html> (October 6, 2012) – for more information

Even though many aspects of air quality are out of the hands of individual park units, as part of the Green Parks Plan, parks have begun to calculate and monitor mobile greenhouse gas (GHG) emissions within parks. The emissions — primarily carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) — are reported as metric tons of carbon dioxide equivalents (MTCO<sub>2</sub>e) from park operations, visitors and concessionaires.

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The following table summarizes mobile GHG emissions in each focus park. One key national strategy recommends the implementation of no-idling policies, especially in parks with diesel-fueled transit systems and/or significant tour bus traffic.

Park	Park Operations (MTCO <sub>2</sub> e)	Visitors (MTCO <sub>2</sub> e)	Concessionaires (MTCO <sub>2</sub> e)	Total Mobile GHG Emissions (MTCO <sub>2</sub> e)
BRCA	181.0	2601.0	0.0	2601.0
CHIC	268.0	615.0	0.0	615.0
GLAC	1,288.9	11,009.0	30.7	11,039.7
GRCA	NA	NA	NA	NA
GRTE	788.9	22,400.7	3.0	22,403.7
MEVE	275.1	5,328.5	0.0	5,328.5
ROMO	692.4	16,564.2	0.0	16,564.2
SAGU	228.3	1,817.2	0.0	1,817.2
SAAN	145.3	2,616.2	0.0	2,616.2
WHSA	0.0	987.8	0.0	987.8
YELL	NA	NA	NA	NA
ZION	1,577.0	6,262.0	153.9	6,415.9

*Climate Leadership in Parks (CLIP) Inventory Tool*

## Noise/Soundscapes

Many of the focus parks indicated an increased problem with noise impacting the park's soundscape. The noise impacts have been identified as coming from multiple sources. Parks like Bryce Canyon (and others) indicate idling buses and motorcycles as primary sources of noise. Grand Canyon combats aerial noise sources such as helicopters and airplanes. Grand Canyon, Rocky Mountain, and Yellowstone indicate that noise from high volumes of traffic (all types) impact their soundscapes and are working to develop flight restrictions to address the impacts. Grand Teton has used noise abatement procedures at Jackson Hole Airport to reduce noise impact from airplanes.

## Lighting/Dark Skies

Many of the IMR park units are recognized for their dark skies and the ability to observe the night sky. Parks such as Bryce Canyon, Grand Canyon, and White Sands provide night sky observing opportunities with annual festivals as well as regular ranger led programs. Increased development outside parks as well as lighted facilities like lodges and parking lots threaten to impact night sky observation opportunities by increasing the amount of light pollution.

## Vegetation/Revegetation

Multiple focus parks indicate two of the same issues that impact vegetation: social trails and undesignated parking. Social trails are commonly formed when visitors depart developed and maintained travel areas and travel cross country through native vegetation. These trails destroy vegetation and increase the risk of erosion. Vegetation is also destroyed through soil compaction when visitors use roadway shoulders and other areas as overflow parking areas. Destroyed vegetation in these areas increases the potential of stormwater runoff causing erosion and invites invasive species to take hold.

Additionally, roads and the fill material they are built on can act as barriers to sheet water flow; in some cases, the vegetation has changed on the ‘drier’ side of the road. Each transportation project provides opportunities to improve existing problems. However, it should be noted that new limits on the FHTP under MAP-21 restrict NPS’ ability to fund strictly wildlife or fish projects.

## Stormwater Drainage

The impermeable surfaces of roads and parking areas increase the volume and velocity of stormwater runoff. As a result, park resources as well as the assets themselves are at risk of eroding. Grand Teton has identified stormwater runoff as an issue that is currently eroding riverbanks as well as roadway bases. These high velocity, high volume events can affect water resources and aquatic migration of species that use the waterways. Substantial runoff can block migration corridors limiting the ability for species to reproduce.

Overused areas exhibit as increasing and sometimes pronounced erosion in spot locations. The loss of vegetation in these areas in addition to repeated use increase soil exposure to moisture and runoff, increasing erosion. Without the proper vegetative cover, many of these soils are unable to withstand erosion from stormwater runoff, roadside parking, and social trails.

## Visual Resources

Protecting visual resources is one of the primary elements of the NPS Mission. Scenic resources are an image formed by visitors that impart ideas, memories, and feelings. These concepts are often at the core of the visitor experience and leave lasting impressions. Scenic vistas are key to understanding both the aesthetic and cultural context of each park. These impressions keep visitors coming back to re-experience the feelings – or looking for the next beautiful park.

Over time, some critical visual resources have been eroded or are threatened from either internal or external sources. Internal threats may result from changes within a park and may affect views within and into a park. External threats result from actions outside a park and affect the view from the park. Even the most remote parks may be at risk from various threats.

Examples of Threats to Visual Resources *	
Visitor access roads	Federal lands agencies are beginning to use innovative GIS-based and photogrammetric tools to measure and display impacts from existing or planned improvements. However, close field inspection by experienced resource specialists should accompany any proposed changes so as to properly avoid or mitigate unwanted impacts.
Service roads and buildings	
Visitor service facilities, including parking areas	
Directional and wayfinding signage	
Communication towers and antennas	
Water tanks	* From a presentation by Suzanne Gucciardo, Natural Resource Specialist for the Lewis and Clark National Historic Trail at the Resource Information Management Conference, April 22, 2010, Ft. Collins, CO.
Wind turbines	
Climate change affecting vegetation	
External development near park boundaries	

## World Heritage Sites

In 1972, the General Conference of UNESCO (United Nations Educational, Scientific and Cultural Organization) adopted an international agreement (signed to date by more than 175 States Parties) with the primary mission of defining and conserving the world's heritage, by "drawing up a list of sites whose outstanding values should be preserved for all humanity and to ensure their protection through a closer cooperation among nations."

The World Heritage List includes more than 780 properties and grows longer every year as new nominations are accepted by the Committee and more countries sign the Convention. At present, there are 15 World Heritage Sites managed by the National Park Service.

The Intermountain Region manages six World Heritage Sites. The following table lists each IMR World Heritage Site, why it is important, and how transportation infrastructure and operations potentially impact these locations.

## World Heritage Sites



Park	World Heritage Designation	Potential Transportation Impacts
Carlsbad Caverns	Natural – Caves with profusion, diversity and beauty of mineral formations.	Increased runoff can permeate caves and destroy mineral formations
Chaco Culture	Cultural – Outstanding elements of a vast pre-Columbian cultural complex	Concentrated visitor locations risk damaging fragile soils, contributing to erosion and loss of vegetation.
Grand Canyon	Natural – One of the best preserved records of geologic history	Crowding and erosion of fragile soils, noise from transit systems and air tours
Mesa Verde	Cultural – Archeological sites provide testimony to ancient cultural traditions of Native American Tribes	Increased runoff can damage ancient building sites
Waterton-Glacier International Peace Park	Natural –Superlative mountain scenery, high topographic relief, glacial landforms and diversity of wildlife and wildflowers	Crowding, noise, and loss of solitude
Yellowstone	Natural – One of few remaining large intact ecosystems, largest collection of geothermal sites, refuge for rare plant and animal species	Increased runoff impacts geo-thermal features, animal/vehicle conflicts

## SUSTAINABLE OPERATIONS

### Sustainability Emphasis

The emerging goal of sustainability is intended to support NPS resources and services for the long run. Like all national parks, the Intermountain Region is home to irreplaceable resources that must be managed effectively for the generations. Risks include:

- Sustainable and consistent funding to manage capital, maintenance, and operations expenditures
- Outdated or overused infrastructure
- Cultural and natural resource impacts

The National Park Service has taken the position that sustainability must become not just another goal, but the context in which all of its work is to be done. The broader definition of sustainability that includes financial, social, and environmental relationships favors integrated solutions including institutional reforms, improved travel choices, economic incentives, land use changes, and technological innovation like the continued development of green materials for infrastructure. Sustainability planning requires changing the way people think about and solve transportation problems. This LRTP factors all aspects of sustainability into decisions affecting transportation.

### Green Parks Plan

The NPS Green Parks Plan, a collaborative product developed by staff from parks, regions, and national support offices, establishes the direction for the agency as it seeks to incorporate sustainable principles throughout all activities. It endorses a set of primary goals to improve environmental performance across the parks and takes into account the facility management life cycle—from planning, design, and construction, to operations, maintenance, and disposition.

#### Key IMR Sustainability Impacts (Green Parks Plan)

In 2009, IMR consumed and spent the following on resources:

- 678,000 gallons of gasoline costing an estimated \$1.57 million
- 42,136 megawatt hours of purchased electricity costing an estimated \$4.86 million
- 788,000 gallons of propane costing an estimated \$1.4 million
- Grand Canyon, Flagstaff, Zion, Yellowstone, and Timpanogas Cave collectively spend over \$2.6 million a year for solid waste management. Using the lowest four parks to create an average cost per visitor, IMR hypothetically spends around \$26 million a year for solid waste management.

If IMR was to increase efficiency by 20% the following potential savings would be found:

- \$314,782 in gasoline at \$2.32 per gallon or almost \$500,000 at \$3.50 per gallon
- \$974,000 in purchased electricity
- \$281,000 in propane

According to annual energy & water data, parks in the Intermountain Region consumed 760.54 million gallons of water in 2009. In many cases this figure does not include irrigation.

According to an NRDC report, 7 of the 12 western national parks most at risk as a result of climate change are found in the Intermountain Region.

## REGIONAL AND COMMUNITY PARTNERSHIPS

Federal agencies encourage partnerships as a way to leverage resources and accomplish more than any one group could do on its own. Partnerships can include individual contributions, volunteers, corporate contributions, and foundations. These shared responsibilities are becoming ever more critical in this era of constrained financial resources.

Many IMR parks interact with and enhance surrounding communities and are in turn supported by a wide range of communities, volunteer groups, environmental groups, and federal and state agencies. The National Park Service works with these critical stakeholders that on a regular basis to connect the park units to surrounding areas. The following are examples and descriptions of important relationships the Intermountain Region and its parks maintain. For additional information about park-specific partnerships, see Chapter 4.

### Regional Communities

These locations include gateway towns and cities that provide access and services to local park units. Some gateway communities are located at a park's entrance such as Bryce Canyon City, UT, West Yellowstone, MT and Estes Park, CO. Other park units are located in or near large metropolitan areas. These areas have Metropolitan Planning Organizations (MPOs) that coordinate transportation planning and other investments for the region. Examples of MPOs in the Intermountain Region include San Antonio-Bexar County MPO, Pima Association of Governments, and the Denver Regional Council of Governments. Regional and other gateway communities and MPOs have tremendous impact on visitor access to IMR park units and in many ways act as an extension of the NPS by helping to welcome park visitors. Regional and community stakeholders should encourage all existing and current partners to explore innovative funding mechanisms that would mutually benefit each of them.

### Federal Agencies and Landholders

Multiple federal agencies own and manage lands that surround many of the IMR park units. It is important to coordinate activities and planning efforts on the lands that surround NPS park units.

Federal agencies within the IMR that may impact park units include:

- United States Forest Service [Department of Agriculture] – oversees and manages National Forests as well as some National Monuments, National Recreation Areas and National Wildlife Areas.
- Bureau of Land Management [Department of the Interior] – oversees and manages federal public lands set aside predominantly in the states that make up the Intermountain Region. Many of these lands include Wilderness Study Areas (WSA) and other special management areas.
- Bureau of Reclamation [Department of the Interior] – oversees man-made water bodies and other navigable waterways in the vicinity of several park units. The Bureau manages water levels as well as any power generation and other resources generated by the facility.
- United States Fish and Wildlife Service [Department of the Interior] – oversees and manages National Wildlife Refuges in the vicinity of some park units. The Service also maintains the threatened and endangered species lists, many of which are protected in IMR park units.

## Indian Nations

Many parks in the IMR preserve and maintain cultural artifacts or sites and from Native American tribes. In some cases, tribes donated land to the NPS in order to best preserve their cultural history. Many tribes hold close ties to areas within IMR park units, considering many of the areas sacred. There are over 90 Indian Nations within the IMR. The IMR collaborates closely with tribes to ensure appropriate steps are taken at each step of planning, construction, and maintenance. Refer to Appendix D – Asset Conditions by State for a full listing of Indian Nations by state.

## US DOT and State DOTs

Most park units in the region are accessed by state highway routes and federal highway routes. This puts an added emphasis on coordinating with state DOTs and the Federal Highway Administration to best manage access routes to park units. The eight states in the region manage all state routes within their jurisdictions; they also manage many of the federal highways in each state. Coordinating with each DOT can help improve efficiency of highway improvements and also get necessary improvements to park access included in local and regional plans.

This LRTP includes an outreach program to each state DOT. Outreach includes identification of key decision makers and a process for regular contact regarding policy, programming, and project implementation.

## International Jurisdictions

The Intermountain Region is unique in that Glacier National Park is an International Peace Park shared with Waterton National Park in Alberta, Canada. As a result, provincial agencies in Canada manage lands that border Glacier. In addition, the Province of Alberta manages several highways that provide access to the park. These agencies need to be considered in the spirit of international cooperation which is a primary goal of Glacier-Waterton Park.

## CLIMATE CHANGE

Tackling climate change successfully depends on developing sustainable practices. Throughout the National Park Service, the effects of climate change are already impacting natural and cultural resources. At Joshua Tree National Park, changes in climate are making the park inhospitable to its namesake species. Glacier National Park is rapidly losing its glaciers. The loss of forests to drought, disease, insects, and fire threaten long-term changes to huge swaths of the west.

As stewards of national cultural and natural jewels, the National Park Service is working to not only decrease its environmental footprint, but also to adapt to future conditions. These activities are reinforced by recent Executive and Secretarial mandates that require agencies to become more sustainable and to track and mitigate greenhouse gas emissions.

The Sustainable Operations and Climate Change (SOCC) program focuses mainly on measuring and mitigating greenhouse gas emissions through sustainable practices, but also focuses on climate change education and facilities adaptation to climate change. The program has two main components: Climate Friendly Parks and Facilities Adaptation.



### *Climate Friendly Parks*

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. The CFP program provides the tools and technical and financial support for parks to assess and decrease their emissions and to educate staff and visitors about climate change. Through the program, parks develop sustainability/climate action plans that involve improving energy efficiency, using renewable energy resources, reducing waste, and managing wastewater and runoff. They also begin envisioning how they will adapt to future climatic scenarios. These actions help preserve America's treasures for future generations by demonstrating environmentally sound behavior to NPS's more than 275 million annual park visitors.

The Intermountain Region has eleven certified climate friendly parks, including Grand Canyon-Parashant National Monument, which is co-managed by NPS and Bureau of Land Management. Four other IMR park units (Bryce Canyon NP, Devils Tower NM, Grand Teton NP, and Yellowstone NP) are currently in the certification process.

Park	Status	CC Action Plan
Bandelier NM	Certified	Complete
Bryce Canyon NP	In Process	-
Devils Tower NM	In Process	-
Flagstaff Area NMs (Walnut Canyon, Sunset Crater, Wupatki)	Certified	Complete
Glacier NP	Certified	Complete
Grand Canyon NP	Certified	Complete
Grand Canyon-Parashant NM	Certified	Complete
Grand Teton NP	In Process	-
Lake Mead NRA	Certified	Complete
Rocky Mountain NP	Certified	Complete
Yellowstone NP	In Process	-
Zion NP	Certified	Complete

*URS Summary of [www.nps.gov/climatefriendlyparks](http://www.nps.gov/climatefriendlyparks), accessed August 2012*

### Examples of Climate Change Response Goals and Strategies

#### **Bandelier NM**

Goal: Reduce transportation emissions to 40% below 2007 levels by 2012.

Strategies: Reduce fleet consumption, switch to some non-emissive electric vehicles, develop a public transportation link to the Los Alamos County transit system for both visitors and employees, consider employee shuttle system, and more.

#### **Bryce Canyon NP**

Strategies: Planning for ways to accommodate alternative modes such as bicycles and shuttles.

#### **Chickasaw NRA**

Strategies: Improving energy efficiency of buildings and lighting, reducing vehicle fuel consumption, recycling programs.

#### **Flagstaff Area NMs (Sunset Crater NM, Walnut Canyon NM, Wupatki NM)**

Goal: Reduce GHG emissions to 10% below 2008 levels by 2016.

#### **Glacier NP**

Strategies: Create multi-modal shuttle system as an alternative for visitor transportation, bicycle and pedestrian pathways, bicycle rental service, partner with surrounding communities to extend and connect park alternative transportation options beyond park boundaries, initiate staff transportation alternatives for on-the-job travel, reduce number of single-passenger cars driven by employees to and from work through alternative transportation initiatives for commuting, employee bicycle share program, manage fleet efficiency.

#### **Grand Canyon NP**

Goal: Reduce transportation-related GHG emissions from park operations 20% by 2020

Strategies: Reduce NPS vehicle and equipment fuel consumption (develop a green fleet management plan, right-size the fleet, promote efficient driving through training and signage, use alternative fuel vehicles, develop a no-idling policy), reduce GHG emissions from visitors (promote use of trails, expand greenway trail network, explore use of bike lanes, partner with surrounding communities on alternative transportation initiatives, and more), other (evaluate adaptive TM strategies, provide advanced warning of parking conditions via VMS, deploy additional transit capacity when needed, and more).

#### **Grand Canyon-Parashant NM**

Goal: Reduce operations transportation emissions by 10% below 2008 levels by 2018.

Strategies: Behavioral changes (query staff about carpool feasibility, develop bicycle parking and storage areas, encourage additional use of teleconferences and video conferences), reduce visitor vehicle fuel consumption (encourage visitors to drive more fuel efficient vehicles), reduce NPS vehicle and equipment fuel consumption (compress work week of field crews and other staff), replace NPS vehicles and equipment (acquire hybrid vehicles).

#### **Grand Teton NP**

Strategies: Completion of Pathways multi-use trail from Jackson to Jenny Lake which may encourage more bicycle access to the park

#### **Lake Mead NRA**

Goal: Reduce park operations transportation emissions to 10% below 2008 levels by 2016.

Strategies: Transportation-related behavioral changes (reduce visitor vehicle idling, encourage green certification by bus operators, implement real time launch ramp information (Twitter, Facebook, TIS) to allow visitors to choose launch area with the shortest wait time, and more); reduce visitor vehicle fuel consumption (replace two-stroke engines in fleet, consider expanding shuttle service, and more); reduce NPS vehicle and equipment fuel consumption (right-size fleet, raise fleet's mpg average through vehicle replacement, replace two-stroke engines, and more); replace vehicles and equipment; vehicle maintenance; transportation infrastructure (improve parking lot designs).

*continued*

*continued*

**Mesa Verde NP**

Strategies: Converted to B20 for diesel fleet. Partnering with concessionaire and Colorado Clean Cities Coalition to replace gas vehicles with gas/hybrids. The park purchases electricity from renewable sources.

**Rocky Mountain NP**

Goal: Reduce transportation emissions by 469 MTCE (17%) below 2005 levels by 2017.

Strategies: Reduce visitor VMT (develop and expand the shuttle system, develop a pricing structure for vehicles entering the park); replace existing park, concessionaire, and other vehicles with alternative fuel vehicles and hybrids (replace 50% of gasoline cars/trucks and diesel vehicles with best available technology, and more); work with partners to improve efficiency of transportation systems (increase shuttle capacity from Estes Park, work with surrounding Front Range communities, partner with county commissions).

**Saguaro NP**

Strategy: Bicycle activity reduces the number of personal vehicles in the park.

**Zion NP**

Goal: Reduce fuel use and GHG emissions from employee and partner transportation, from park service fleet, and from visitor transportation.

Strategies: Reduce fuel use and GHG emissions from employee and partner transportation; obtain alternative transportation: employees and NPS Partners; employ alternative fuels (E-10 and B-20); supply loaner bikes for employees; reduce fuel use and GHG Emissions from Park Service Fleet; improve fleet management; reduce fuel use and GHG emissions from visitor transportation; expand shuttle bus service; increase bicycle accessibility of park; reduce vehicle idling.

(For more information, please refer to [http://www.nps.gov/climatefriendlyparks/parks/applicant\\_parks.html](http://www.nps.gov/climatefriendlyparks/parks/applicant_parks.html))

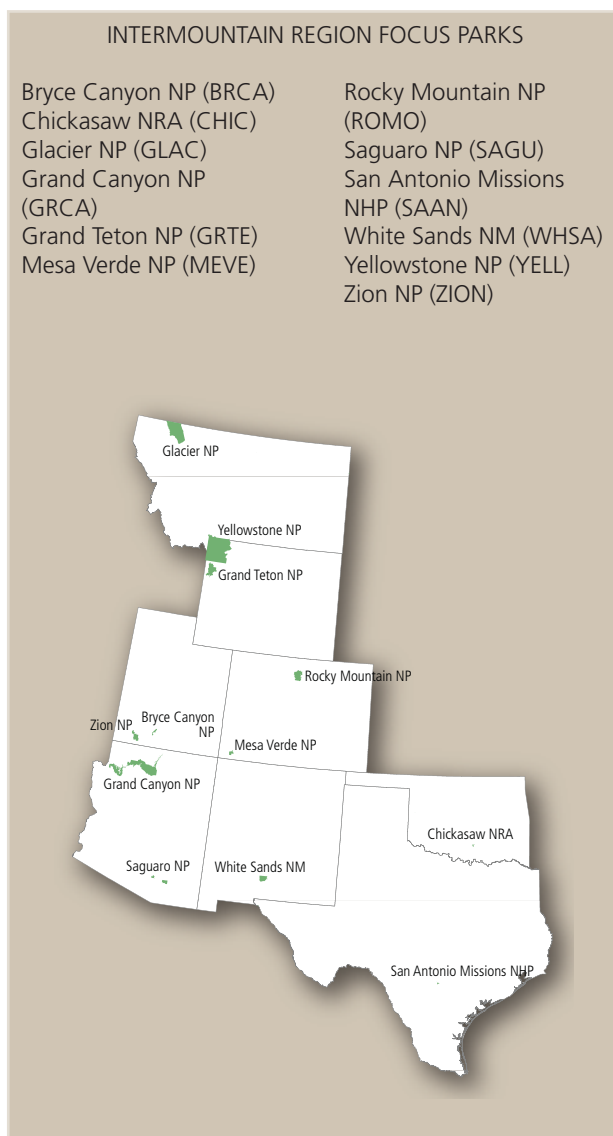
## CHAPTER 4 - TRANSPORTATION SYSTEM: 12 FOCUS PARKS

The IMR contains 93 parks of varying size, visitation, and context. With such a diverse set, a regional investigation and summary overlooks specific problems and challenges at the park level. As a result, the IMR has taken the unique approach of investigating transportation conditions at 12 focus parks throughout the region. The focus parks represent a diverse set of parks within the region. The parks range from 500,000 to 4.4 million in annual recreation visitation, <1 to 3,500 square miles in size, and rural to suburban contexts. Each state in the Intermountain Region is represented by at least one focus park providing increased regional diversity.

The focus park investigations were used to inform the regional transportation plan by infusing localized data and experience into the planning process. With the diversity of park units throughout the region, localized experience is considered essential to make an effective and applicable regional transportation plan.

All aspects of the regional analysis were studied at the focus park level. In addition, phone interviews and surveys were conducted with each park to obtain a local perspective on park issues and challenges. Each focus park also used the opportunity to discuss transportation topics that are most important to them locally.

This chapter summarizes the Key Findings and Challenges for each of the focus parks in relation to the five identified goal areas: Asset Management; Mobility, Access and Connectivity; Visitor Experience; Resource Protection; and Sustainable Operations. Supporting text, charts, tables, and interview and survey synopses provide further information about the identified key findings.

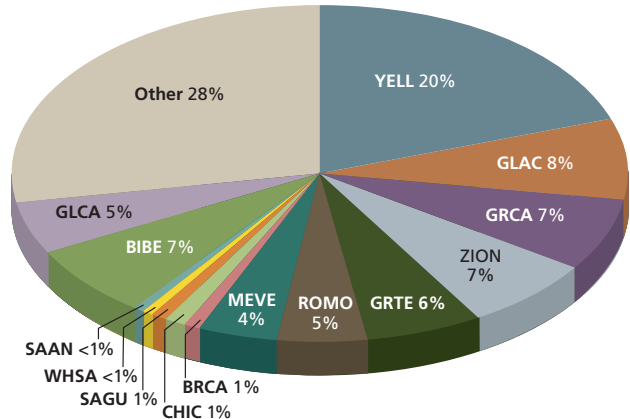


## CURRENT REPLACEMENT VALUE OF TRANSPORTATION ASSETS .....

The focus parks account for 60 percent of current transportation asset value within the region. Individually, Yellowstone National Park accounts for almost one-fifth of asset value. Grand Canyon, Glacier, Grand Teton, Rocky Mountain, and Zion each account for 5 percent or more of regional transportation asset value. Each one of these parks is considered a high visitation park. Separating out Big Bend and Glen Canyon, the remaining 78 park units account for only 28 percent of the region's transportation asset value.

**IMR Park Unit Asset Value**

CURRENT REPLACEMENT VALUE = \$6,696.3M

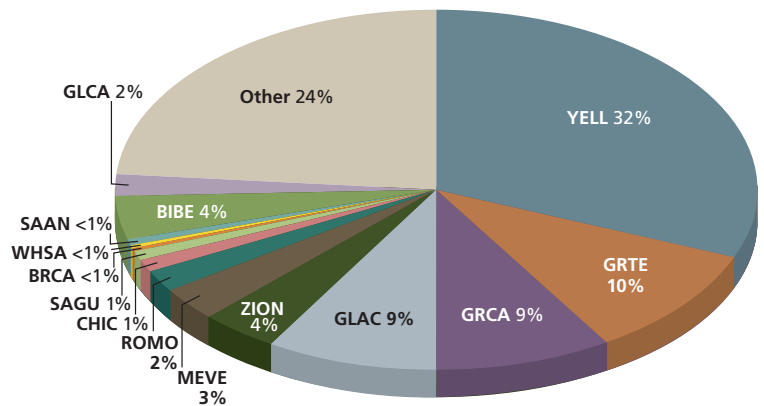


## FOCUS PARK DEFERRED MAINTENANCE .....

The focus parks account for 70 percent of current transportation deferred maintenance within the region. Individually, Yellowstone National Park accounts for almost one-third of deferred maintenance. Grand Canyon, Glacier, and Grand Teton each account for 5 percent or more of regional transportation deferred maintenance. Separating out Big Bend and Glen Canyon, the remaining 78 park units account for only 24 percent of the region's transportation deferred maintenance.

**IMR Park Unit Deferred Maintenance**

TOTAL DEFERRED = \$877.3M



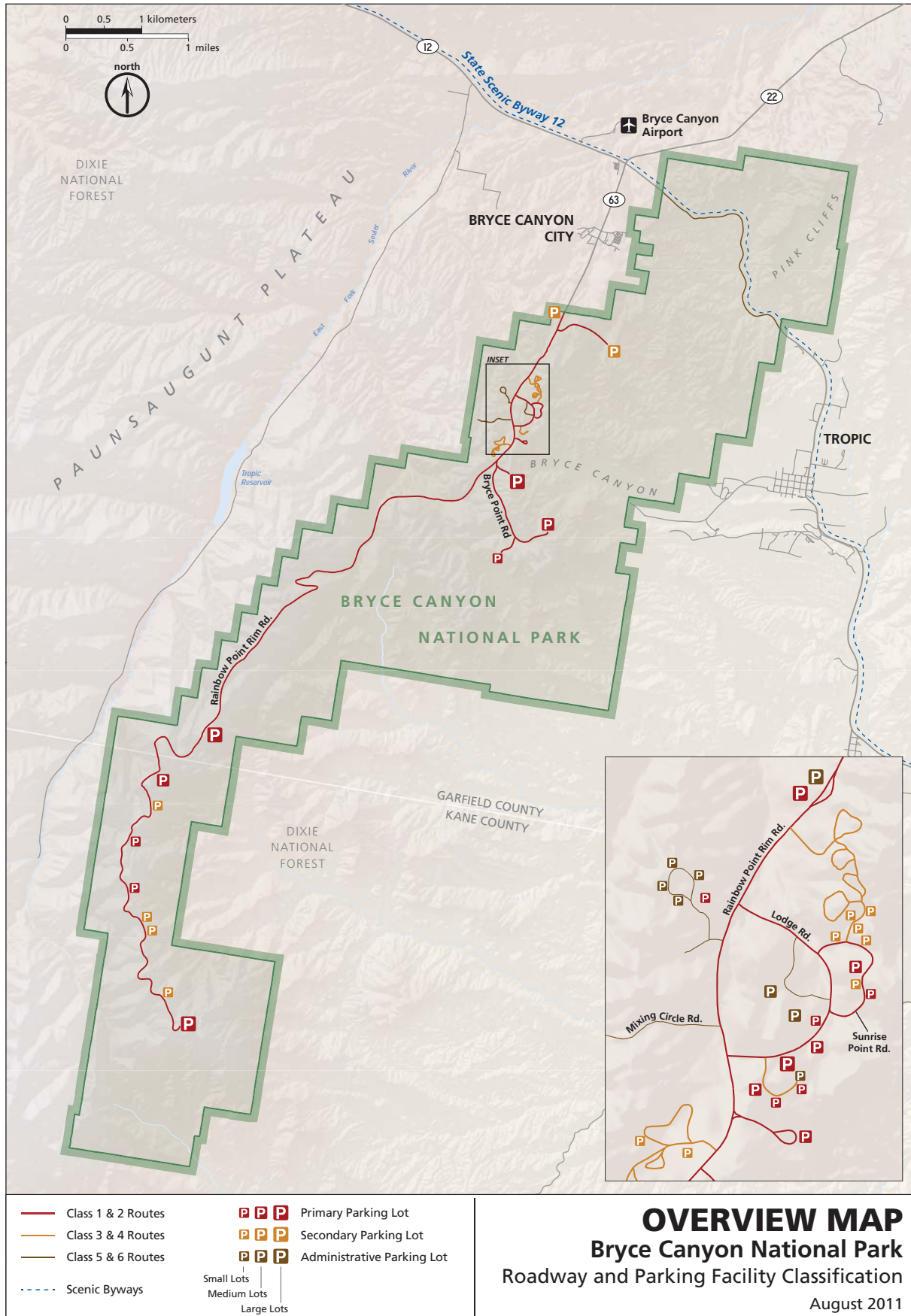


# Bryce Canyon National Park

(BRCA)



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## BRYCE CANYON NATIONAL PARK (BRCA)

## AT A GLANCE

STATE: Utah    SIZE: 56 square miles    TYPE: Rural

ROADWAY/PARKING CONDITION (CYCLE 4)					Asset Management	
	PCR	DM	Lane Miles	Area/Spaces		
Roadways	84 / FAIR	\$0.8 Million	54	–		
Parking	68 / FAIR	\$0.1 Million	–	768,000 SF / 1,260		
Replacement Value of All Transportation Assets			\$88.8 Million			
					Mobility, Access, & Connectivity	
CONGESTED AREAS			ALTERNATIVE TRANSPORTATION SYSTEM			
<ul style="list-style-type: none"><li>• Parking Areas</li><li>• Park Entrance Stations</li><li>• Scenic Overlooks</li><li>• Visitor Centers</li></ul>			Annual Boardings	980,000		
			Fuel Type	Diesel		
			FEES			
			Transportation Fee	\$15		
	FLREA (% retention)	80%				
					Visitor Experience	
VISITATION (2010)			VISITOR EXPERIENCE QUALITY SCORE			
Total Visitors	1,780,000		Roads	Parking		Date
Non-Recreation Visitors	497,000		Not Rated	86		2009
Recreation Visitors	1,285,000		(University of Idaho Survey)			
10-Year Trend	+13.5%		TOP ACTIVITIES			
	<ul style="list-style-type: none"><li>• Sightseeing/Scenic drive</li><li>• Photography</li></ul>					
					Resource Protection	
AT-RISK RESOURCES			TRANSPORTATION/RESOURCE ISSUES			
<ul style="list-style-type: none"><li>• Cultural Resources</li><li>• Air Quality/Dark Skies</li><li>• Soundscape</li><li>• Threatened/Endangered Species</li></ul>			Vehicle congestion	Wildlife/vehicle crashes		
			Crowding	Vehicle noise		
			Air Quality Status	Not Monitored/Regulated		
					Sustainable Operations	
KEY PARTNERS			Climate Friendly Park Status	In-process		
<ul style="list-style-type: none"><li>• Bryce Canyon City</li><li>• Highway 12 Scenic Byway</li><li>• US Forest Service</li><li>• UDOT/Region 4</li></ul>			Green House Gas Emissions	2,601 Metric Tons		
			(CLIP)			

**INTERMOUNTAIN REGION**  
**LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT**

**Key Transportation Findings and Challenges**

Asset Management	Investment in roadway pavement condition has resulted in significant improvement. However, parking area pavement conditions have declined.
	93% of parking areas rated Fair condition; 0% rated Good.
	\$0.9 M in deferred maintenance of transportation assets, less than 1% of the IMR total.
Mobility, Access, & Connectivity	Congestion throughout the park, including the park entrance station, scenic overlooks, parking areas, and especially at the visitor center, during the peak season is the most notable issue for this park.
	More than 5,000 large vehicles, such as tour buses and RVs, enter the park each month during peak season, contributing to congestion on the roads and in parking areas.
	The shuttle system has been helpful in mitigating congestion, but it, too, is now overloaded at peak times. The potential to expand shuttle services is questionable, given the cost of operations over the long term. Even operation of the current system will stress expected funding.
	48% of visitors use the ATS shuttle system, with high levels of midweek crowding on buses and long wait times during peak season.
	The number of available parking spaces does not match projected demand. The Park has 1,260 parking spaces, but as many as 3,900 private vehicles have entered the park on a peak visitation day. The high number of large vehicles (RVs and tour buses) tax parking lots and narrow roads. However, the financial costs and resource impacts may prevent or delay large scale expansion, pointing to the need for travel demand management and other management alternatives to address crowding issues.
Visitor Experience	Over 40% of vehicle crashes occur in parking lots.
	2010 Recreation Visitation 1,285,492 (Medium).
	Recreational visitation grew 2.1% annually 2001-2010.
	28% of all visitation to the park is non-recreational, resulting from through trips on Utah State Highway 12. Since no fees are collected, this presents a maintenance challenge for the park, UDOT, and FHWA.
	While some ITS applications are in place, the benefits to date have not been dramatic.
	Carrying capacity, especially at popular overlooks and trailheads, has become a topic of discussion at the park level.
	The historic district, including the Lodge and associated buildings, contain sensitive assets that must be managed appropriately. Costs for transportation-related improvements and maintenance may be increased due to environmental compliance costs. The costs of construction or repairs may also need to take into account the use of expensive or scarce materials; for example, native rock for walls, culverts, and buildings is no longer collected within the park.
	Two percent of roadway lane miles are designated as historic.
	Clean air, dark skies, and the soundscape are critical to achieving sustainability and visitor experience goals. Impacts from vehicles, especially noisy diesel-powered buses, contribute to the degradation of these resources. While the park is making strides to convert its diesel fleet, the many tour buses are predominantly diesel-powered.
	Vehicle/animal conflicts on main park roads are dangerous to both the visitors and wildlife.
Sustainable Operations	An active group of local and regional partners is important in developing programs, plans, and alternatives for the park.
	ATS reduces carbon emissions by removing 30% of visitors' vehicles from park. Park is purchasing hybrid vehicles.
	New multimodal transportation plan is nearly complete.
	Climate Friendly Park certification in process.

Park Website: [www.nps.gov/brca](http://www.nps.gov/brca)

## MISSION

The mission of the National Park Service at Bryce Canyon National Park is to preserve, conserve, protect, and provide for the enjoyment of nationally significant resources including spectacular geologic formations, clean air, panoramic vistas, native vegetation and wildlife, and the history of human interaction with them.

## PARK DESCRIPTION

Founded in 1928, the park is 56.2 square miles in size. Contrary to its name, Bryce Canyon National Park is not a canyon; rather the primary resource is the unique geology consisting of a series of horseshoe-shaped amphitheaters carved from the eastern edge of the Paunsaugunt Plateau. The geology has shaped into unusual formations including slot canyons, windows, fins and spires called “hoodoos.” The flora and fauna of the park include pine, fir, blue spruce, and aspen forests. The animal species include mammals, birds, and a few reptiles. The Utah Prairie Dog, identified as a Threatened and Endangered Species, was reintroduced to Bryce Canyon National Park.

The area encompassed by the park is thought to have been used for hunting and gathering activities by the Paiute tribe. The Navajo tribe may also have frequented the area. Modern discovery of the park was made in 1866. Survey parties explored the park area in the 1870s around the same time Mormon settlements were established in the vicinity of Bryce Canyon.

## PARK LOCATION

Bryce Canyon National Park is located in southwest Utah. Regional connectivity to the park is provided by Utah State Highway 12, a National Scenic Byway. The park is located approximately 270 miles from Salt Lake City and Las Vegas. Cedar City, Utah, is approximately 80 miles from the park.

Nearby National Park Service units include:

- Cedar Breaks National Monument (60 miles)
- Zion National Park (120 miles)
- Capitol Reef National Park (130 miles)
- Glen Canyon National Recreation Area (155 miles)
- Grand Canyon National Park – North Rim (160 miles)

## TRANSPORTATION OVERVIEW

Bryce Canyon National Park consists of 54 roadway lane miles and 802,000 square feet of parking infrastructure. Transportation trails connect cyclist and hikers to scenic areas and shuttle stations. An alternative transportation system, operated by McDonald Transit, serves the national park as well as adjacent Bryce Canyon City. Bryce Canyon Airport lies 5 miles north of the park entrance.

The park entrance is on the north side of the park along Utah State Highway 63. Once inside the park, Utah State Highway 63 becomes Rainbow Point Rim Road. This main route connects the traveling visitor from the park entrance, through the Bryce Amphitheater area and ends in the southernmost section of the park at the Rainbow and Yovimpa Points.

The Bryce Amphitheater area, the northernmost seven miles of the park, has several connecting roads which facilitate access to the most heavily traveled area of the park. South of the Bryce Amphitheater area, Rainbow Point Rim Road meanders and connects the traveling visitor to several sites that have no alternate routes.

The northeastern corner of the park contains four miles of Utah State Highway 12. This road serves as a regional connection to the Bryce Canyon National Park entrance from locations to the north and east.

## ASSET MANAGEMENT

The IMR manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Bryce Canyon National Park transportation assets is \$89 million.

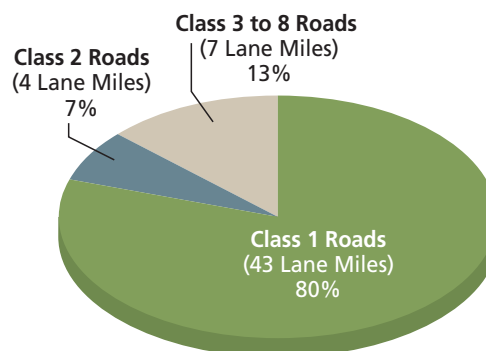
### Bryce Canyon National Park Roadway and Parking Assets

- Approximately 54 lane miles of roadway network on 26 different routes.
- Approximately 802,000 square feet of parking area (approximately 1,315 spaces) provided in 46 identified parking areas.
- The majority of lane miles are defined as Class 1 or 2 roads (87%).

### ROADWAY ASSETS

Class 1 & 2 roads comprise 87 percent of roadways in Bryce Canyon. Less than 15 percent are Class 3 to 8. The breakdown of roadway classifications within Bryce Canyon is very similar to the classification breakdown for the IMR as a whole.

TOTAL LANE MILES = 54



### ROADWAY PAVEMENT CONDITION RATING (PCR)

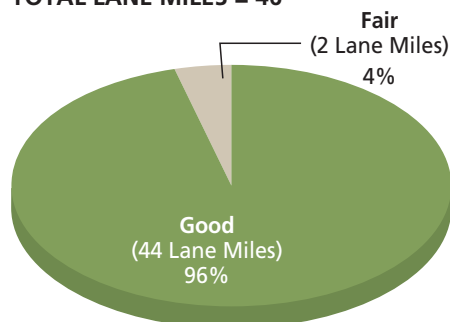
The Class 1 & 2 roads received PCR ratings of good. The Class 3 to 8 roads have a poor rating. The public has access to all these classifications of roads.

Roadway Type	Average PCR*
All Roadways	84 - FAIR
Class 1	91 - GOOD
Class 2	86 - GOOD
Class 3 to 8	52 - POOR

\*Cycle 4 RIP data

### CLASS 1 & 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

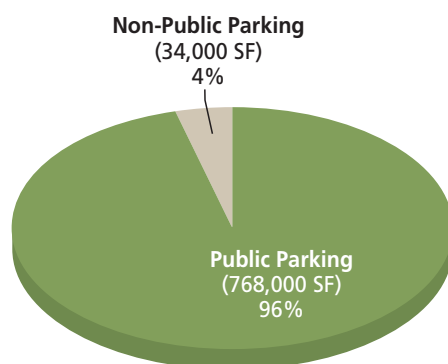
TOTAL LANE MILES = 46



Ninety-six percent of Class 1 & 2 roadway pavement within the park is rated in the good category. No Class 1 & 2 Roadways are in excellent or poor condition.

### PARKING ASSETS

TOTAL SQUARE FEET= 802,000



Approximately 96 percent of the parking facilities are classified as public, while the remaining 4 percent make up non-public facilities. The park provides approximately 1,260 public parking spaces and 55 non-public parking spaces.

### PARKING PAVEMENT CONDITION RATING (PCR)

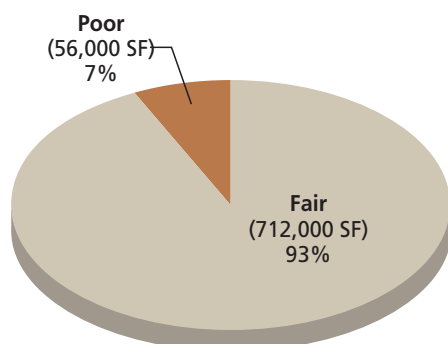
Parking Type	Average PCR*
Public Parking	68 - FAIR
Non-Public Parking	66 - FAIR
All Parking	68 - FAIR

\*Cycle 4 RIP data

Parking assets have a worse average pavement conditions compared to roadway assets.

### PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

TOTAL SQUARE FEET = 768,000



The average PCR for public parking areas is fair. Park wide, public parking areas provide approximately 1,165 spaces (712,000 square feet) in fair condition. The remaining 95 spaces (56,000 square feet) are in poor condition.

**ASSET CONDITIONS OVER TIME** .....

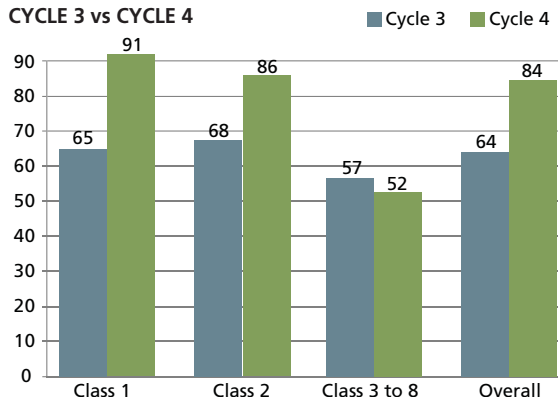
The most recent cycle of RIP data available for Bryce Canyon roadways and parking is Cycle 4. A comparison of Cycle 3 and Cycle 4 asset data provides a snapshot of the conditions of Bryce Canyon National Park assets over time. Between 2006 and 2012 the roadway pavement conditions within the park improved from 64 to 84. The parking pavement conditions degraded from 87 to 68.

**ROADWAY**

The average condition of Class 1 & 2 roadways improved significantly. The remaining classes degraded on average. The overall PCR improved from 64 to 84.

**ROADWAY CONDITIONS**

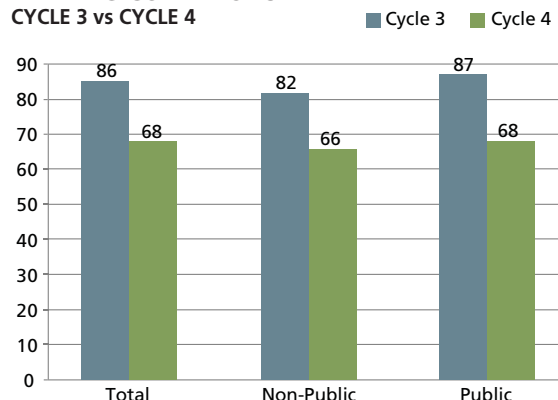
CYCLE 3 vs CYCLE 4

**PARKING**

The average condition for all parking classifications degraded from Cycle 3 to Cycle 4. Both public and non-public parking experienced a similar magnitude of degradation.

**PARKING CONDITIONS**

CYCLE 3 vs CYCLE 4

**TRANSPORTATION TRAILS** .....

Bryce Canyon National Park contains one transportation trail meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities." The Rim Trail is designated for pedestrians only and links several shuttle stops, viewpoints, and the lodge.

- Condition - Good
- Deferred Maintenance - \$0
- Current Replacement Value - \$6,040,007

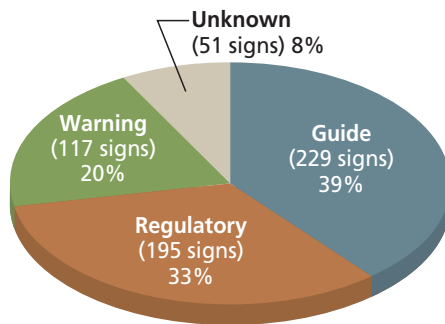
## BRIDGE AND TUNNEL ASSETS

Bryce Canyon National Park does not contain bridge or tunnel assets.

## TRANSPORTATION SIGN ASSETS

### Sign Asset Quantity and Condition

TOTAL SIGNS = 592

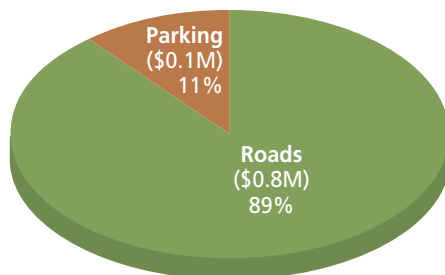


Bryce Canyon National Park roadways and parking areas contain 592 transportation signs. Approximately 39 percent of the signs are guide signs meant to direct visitors to the desired destinations. Fifty-three percent of the signs are regulatory and warning signs.

Condition	Quantity
Good	537
Fair	2
Poor	2

## DEFERRED ASSET MAINTENANCE

TOTAL DEFERRED MAINTENANCE = \$0.9M

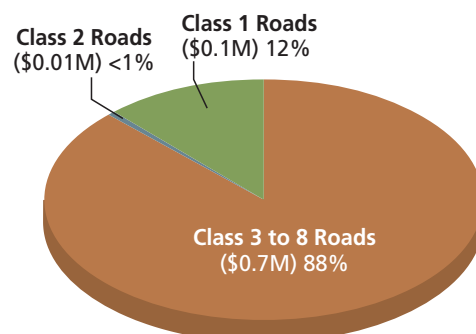


Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when scheduled and/or delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Deferred maintenance within Bryce Canyon National Park totals \$0.9 million.
- Almost 90 percent of deferred maintenance is associated with park roadways.

## DEFERRED ROADWAY MAINTENANCE

TOTAL DEFERRED MAINTENANCE = \$0.8M



- Roadway maintenance within Bryce Canyon National Park totals \$0.8 million.
- Eighty-eight percent of roadway deferred maintenance in Bryce Canyon National Park is associated with the Class 3 to 8 roadways.



## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks, and in Bryce Canyon National Park, has evolved from simply building a road and perhaps some campsites to a complex system that includes much more than managing pavement and parking facilities. In Bryce Canyon National Park, this system includes multimodal facilities that enable visitors to get around like bus and shuttles, trails, and even a nearby private airport. Some components of the operation, like pedestrian facilities, serve to connect modes, points of interest, and other facilities in a useful way. Bryce Canyon National Park has a well-developed bus and shuttle system that enables visitors to connect from points outside the park to many stops inside its boundaries and contributes in a large way to reducing congestion at key locations and times.

### ALTERNATIVE TRANSPORTATION SYSTEMS (ATS) .....

Alternative transportation systems is a term applied to NPS transit operations such as shuttle buses. The Bryce Canyon National Park Shuttle operates 12 hours a day between May and October and can be boarded at 13 locations, including the Shuttle Staging Area at Bryce Canyon City just outside the Park entrance. Shuttle access is included with entrance fees. Route duration, not counting stops, is about 50 minutes.

Supplementing the Bryce Canyon National Park Shuttle twice a day is the free Rainbow Point Shuttle Tour, which is a 40-mile, 3.5-hour round trip tour to the southern end of the park. Reservations are required due to capacity limitations of about 45 passengers, but unclaimed spaces can be filled on a first-come, first-served basis at any of six shuttle boarding areas. The tour departs at 9:00 am and 1:30 pm and is offered between May and October.

The shuttle system, operated by McDonald Transit Associates, is operating at 38 percent of its current capacity. The transit buses are heavily used and at capacity during peak visitation periods.

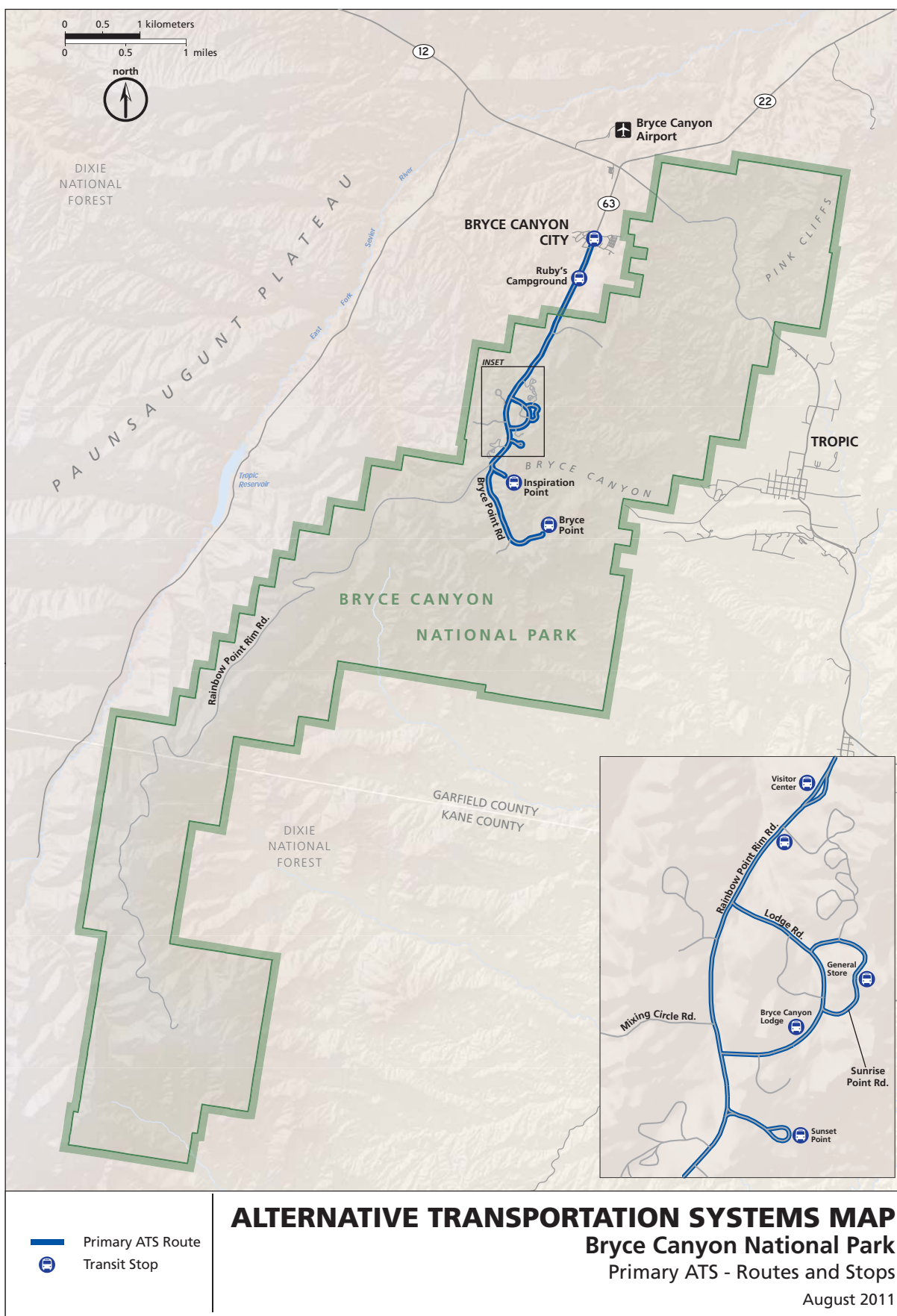
**BRYCE CANYON ATS SUMMARY**

Annual Boardings	980,000 <sup>1</sup>
Service Hours	9,100 <sup>1</sup>
Service Miles	136,000 <sup>1</sup>
Quantity and type	Six 35-foot transit buses Two 40-foot transit buses One MCI tour bus <sup>2</sup>
Fuel	Diesel <sup>2</sup>
Operating Season & Schedule	First Friday in May through the Sunday before Columbus Day in October, 8:00 am – 8:00 pm <sup>3</sup>
Operator	McDonald Transit <sup>2</sup>
Options to riding the ATS route	Drive personal vehicle <sup>3</sup>

<sup>1</sup> BRCA Phase II ATS PRO FORMA

<sup>2</sup> Bryce Canyon National Park Alternative Transportation System Technical Memorandum

<sup>3</sup> <http://www.nps.gov/brca/planyourvisit/shuttle.htm>



## MULTI-MODAL CONNECTIVITY .....

Bikes are allowed on the narrow park roads. A multi-use path is planned to connect from the entrance station to the Rim Trail, but is not yet constructed. The path will eventually extend from the Park, along Highway 63, to the bicycle trail along Highway 12. The ATS buses include bike racks. Outside of the park, the paved Red Canyon trail runs along Highway 12.

## BRYCE CANYON AIRPORT .....

Operated by Garfield County, Bryce Canyon Airport covers 215 acres and offers one asphalt-paved runway, 7,400-feet long and 75-feet wide. The runway caters mainly to aircraft associated with Bryce Canyon Airlines, but also accommodates charters and private aircraft. The airport is located north of SH 12 near its intersection with SH 63 and is located outside of park boundaries.

## SCENIC BYWAYS .....

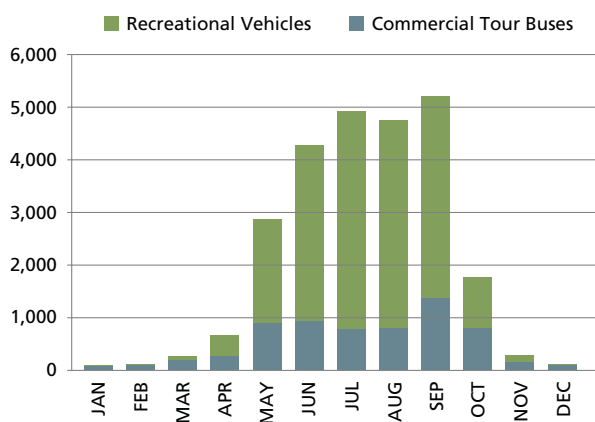
PARK	HWY #	DESIGNATION	SCENIC BYWAY
BRCA	SH 12	State, NSB, NFSB	Scenic Byway 12
BRCA, ZION		State, NSB, NFSB	Scenic Byway 143 Utah's Patchwork Parkway
NSB = National Scenic Byway, NFSB = National Forest Scenic Byway, State = State Scenic Byway			

[www.nps.gov](http://www.nps.gov)

Bryce Canyon is a destination on the Grand Circle (see page 46).

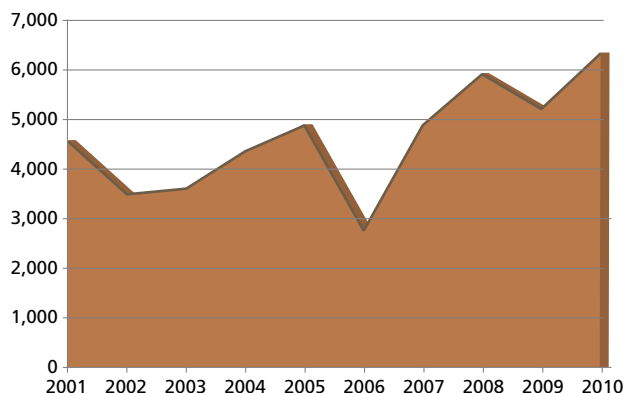
## CONGESTION

## Commercial Tour Bus and RV Vehicles



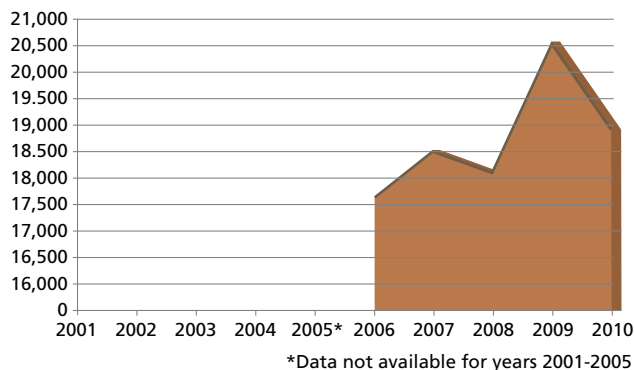
The number of vehicles entering Bryce Canyon National Park increased steadily (3.4% annually) from 2002 to 2010. The peak visitation month in 2010 was July. Bryce Canyon National Park welcomes approximately 3,900 vehicles on a peak visitation day. During peak season, over 5,000 commercial tour buses and RVs visit Bryce Canyon National Park in a month. The volume of buses that enter Bryce Canyon National Park is greatly outnumbered by the number of RVs. During the peak season, RVs outnumber buses 3 to 1. The number of buses and RVs entering the park on an annual basis appear to be increasing over the past few years.

## Annual Commercial Tour Bus Volumes



The number of commercial tour buses is on the rise for the park.

## Annual RV Overnights



The number of RVs entering the park appears to be increasing based on the number of overnight RV stays in the park.

**INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT**

## CONGESTED LOCATIONS

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff listed several congested areas within the park. Many locations near the Amphitheater have been identified as congested.

Congested Areas	Locations Identified
Parking Areas	Visitor Center Parking Sunset Point Parking Bryce Point Parking
Park Entrance Stations	Main Park Road
Scenic Overlooks	Sunset Point Bryce Point
Visitor Centers	Visitor Center Parking

## CONGESTION MITIGATION STRATEGIES

Park staff identified five congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey. These strategies are focused on operations and mobility.

Congestion Mitigation Strategy *	Mitigation Result
Alternative Transportation System (ATS)	Implementation Successful - No longer meets park needs
Fast Pass	Used for transit and park vehicles at entrance
Special Event Management	Works to a degree - still have congestion
Remote Parking with Shuttle	Implementation successful - No longer adequate
Work with local communities	May work to an extent - still have congestion

\* Source: Service-Wide Congestion Management system (CMS); Phase 1: Emphasis Area Identification, Technical Memorandum 7: Compiled Congestion Survey

## ITS STRATEGIES

Park staff identified three ITS congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey. These strategies are focused on the dissemination of park information to visitors. The success of each strategy was also documented.

ITS Strategy	Mitigation Result
Highway Advisory Radio	May be working to an extent - still have congestion
Traffic Information	May be working to an extent - still have congestion
Variable Message Signs	May be working to an extent - still have congestion

The 2011 Update on ITS in NPS report by the Volpe Center showed the following ITS strategies in use by Bryce Canyon National Park.

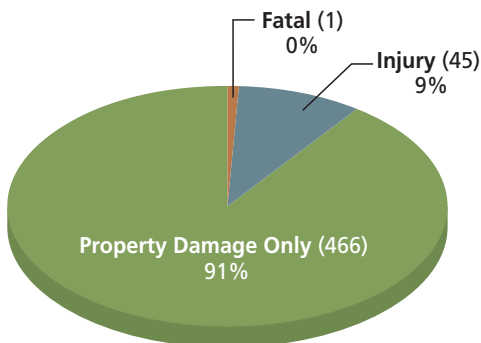
Dynamic Message Signs (portable and permanent)	511 System Integration	Highway Advisory Radio	Loop Detectors / Traffic Counters	Automated Entry System	Coordinate with other Agencies
x	x	x	x	x	x

2011 Update on ITS in NPS, Volpe Center

Bryce Canyon National Park's eTours and podcasts offer visitors a virtual trip through the park's features and attractions to aid in trip planning.

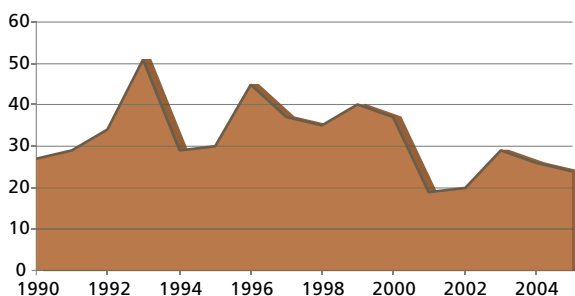
## CRASH SEVERITY

TOTAL CRASHES = 512



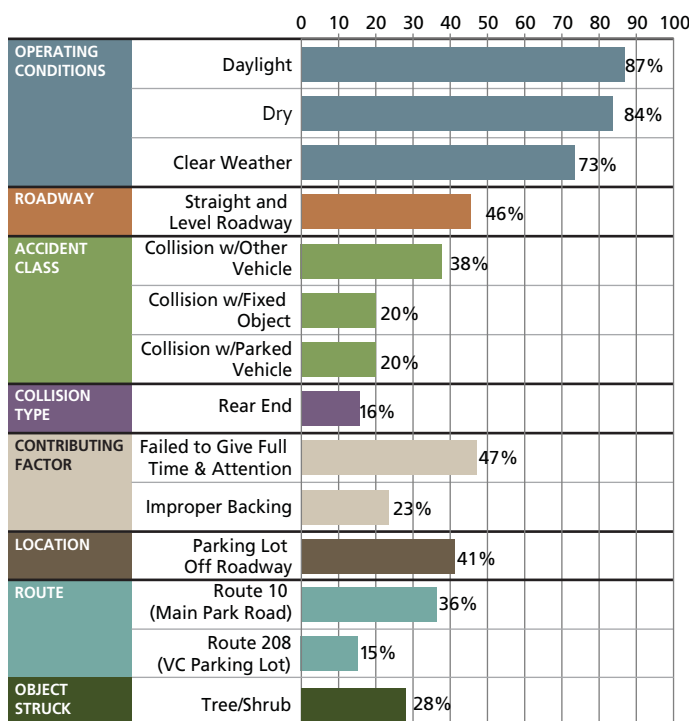
Bryce Canyon National Park experienced 512 crashes between 1990 and 2005. One of these crashes included a fatality and 45 included at least one injury. The majority (91 percent) were property damage only.

## ANNUAL CRASHES



Bryce Canyon National Park averages approximately 32 crashes each year. The park has experienced an annual decline in crashes of approximately 2.4 percent per year. The crash rates within Bryce Canyon National Park are not identified as higher than expected.

## CRASH CONDITIONS



A majority of crashes in Bryce Canyon National Park occur during daylight and dry conditions. Driver inattention is the primary contributing factor indicated to accidents. Over half of crashes involve collisions with fixed objects or other vehicles. Forty percent of crashes with the park occur within the parking areas.

There are approximately 1,260 public parking spaces within the park, while the number of private vehicles entering the park is approximately 3,900 during a peak visitation day.

## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information NPS collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Bryce Canyon National Park. With over 1.7 million visitors annually to the park, NPS is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park. Bryce's eTours and podcasts make it easier to plan a trip and spend time in meaningful ways, whether is taking in the rare geology, hiking through the formations, or night sky watching in the clear air.

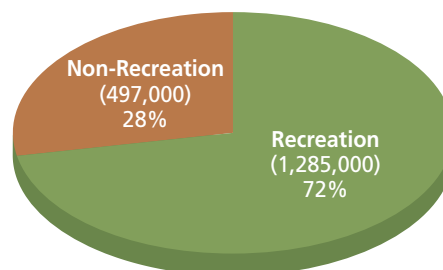
### 2010 VISITATION

Bryce Canyon National Park had approximately 1,780,000 visitors in 2010. Twenty-eight percent of park traffic is non-recreational, with most of those trips traveling through the park on Utah State Highway 12, which traverses the northern section of Bryce Canyon National Park.

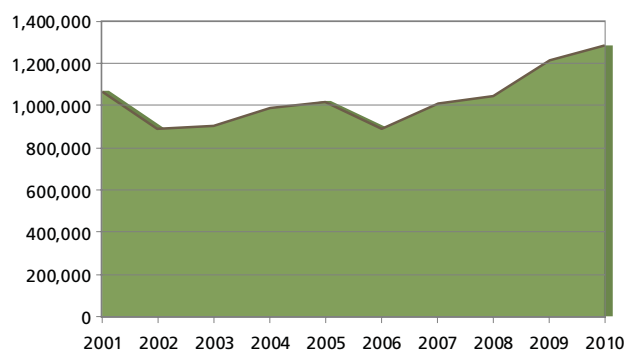
- Visitation increased by about 0.8 percent per year.
- Non-recreation trips have been decreasing by about 0.9 percent per year.
- In 2009, 60 percent of visitors were from the U.S., and 76 percent were visiting Bryce Canyon National Park for the first time.
- During summer months, there are over 25,000 overnight stays per month in Bryce Canyon National Park. Campground and lodge stays account for almost all overnight stays.

#### 2010 Visitation

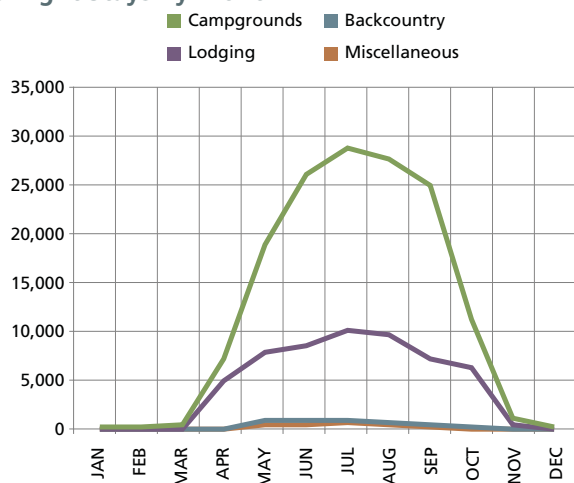
**TOTAL VISITORS = 1,780,000**



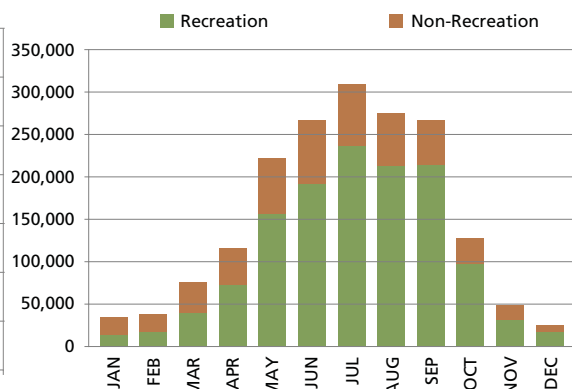
#### Recreation Visitation 2001-2010



#### Overnight Stays By Month

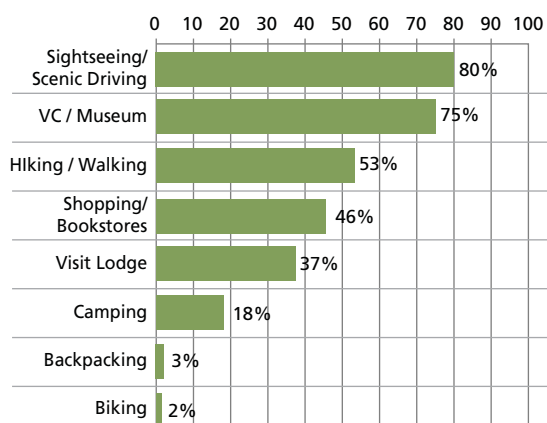


#### Visitors By Month



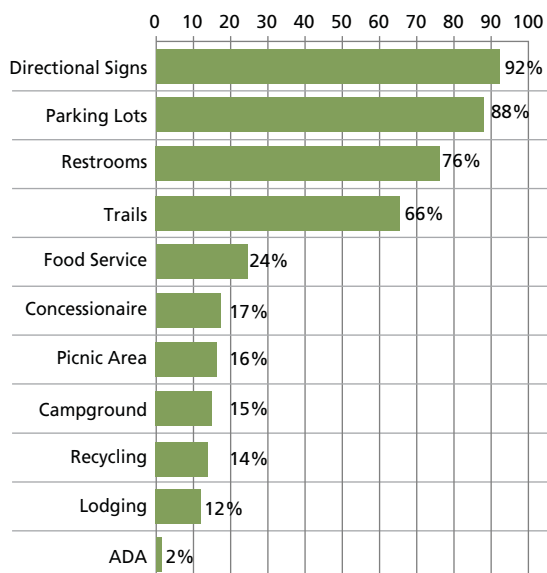


## VISITOR ACTIVITIES



A majority of visitors participate in three primary activities, sightseeing/scenic driving, visiting the museum/visitor center(s), and walking/hiking.

## VISITOR SERVICES USED



Most park visitors (95%) obtain park information prior to their visit. In fact, eTours and several podcasts are available for download from the Internet. They describe various aspects of the park, including an overview of park history and geology, viewpoints, hiking trails, and the scenic drive; wildlife; and the historic Bryce Canyon Lodge.

Surveys have indicated less than one in four visitors used park food service or concessionaire, picnic area, campground or park lodging. In 2009, 48 percent of visitors used the park's shuttle bus system.

## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP, 2009, Stated detractions/negative visitor comments: crowding
- 2010 CMS Survey
  - Congested locations: parking areas, park entrance stations, scenic overlooks, visitor centers
  - Strategies: ATS, Fast Pass, manage special events, remote parking with shuttles, worked with local communities
- Surveys & Interviews, 2011
  - Congested locations: entrance station, parking areas, overlooks
  - Strategies: bicycle paths, expanded transit services

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for the NPS. This section identifies key resources in Bryce Canyon National Park.

### AIR QUALITY AND GHG EMISSIONS

The park had completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

#### Mobile GHG Emissions

Park Operations (MTCO <sub>2</sub> E)	181.0
Visitors (MTCO <sub>2</sub> E)	2601.0
Concessionaires (MTCO <sub>2</sub> E)	0.0
Total Mobile GHG Emissions	2601.0

*Climate Leadership In Parks*

### BRYCE CANYON NATIONAL PARK HIGHLIGHT

Bryce Canyon National Park is the ultimate place to learn about and enjoy the splendor the night sky. Far from the light pollution of civilization and protected by a special force of park rangers and volunteer astronomers known as the "Dark Rangers," Bryce Canyon National Park is the last grand sanctuary of natural darkness. The night sky in Bryce Canyon National Park is dark enough to see 7500 stars on a moonless night. On average Bryce Canyon National Park offers an astronomy program 104 nights per year. Each summer the park hosts a four day Astronomy Festival full of astronomy activities, model rocket launches, and scientific presentations. No visit to Bryce is complete without an evening with the Dark Rangers.

[www.nps.gov/brca](http://www.nps.gov/brca)

### CULTURAL/HISTORIC RESOURCES

The park contains two adjacent historic districts, the Bryce Canyon Lodge Historic District and the Old NPS Housing District, together comprising a unique cultural landscape. While only 2% of park roads are listed as historic, the park must manage all operations within the context of its historic resources.

### THREATENED & ENDANGERED WILDLIFE AND PLANT SPECIES

Common Name	Species Name	Listing Category	Status in Park
WILDLIFE			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Delisted Monitored	Current
California Condor	<i>Gymnogyps californianus</i>	Experimental	Occasional
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Delisted Monitored	Current
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened	Unconfirmed
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Endangered	Current
Utah Prairie Dog	<i>Cynomys parvidens</i>	Threatened	Current
Canada Lynx	<i>Lynx canadensis</i>	Threatened	Unconfirmed
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	Candidate	Unconfirmed
Greater Sage Grouse	<i>Centrocercus urophasianus</i>	Candidate	Unconfirmed
Brown Bear	<i>Ursus arctos</i>	Threatened	Historic
Gray Wolf	<i>Canis lupus</i>	Endangered	Historic
PLANT			
Bryce Canyon Paintbrush		Endangered	Current

# SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Bryce Canyon National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

## ..... REGIONAL AND COMMUNITY STAKEHOLDERS

Bryce Canyon National Park is located in a very rural area of Utah. Only a few small towns provide services outside of the park. Bryce Canyon City is located at the entrance to Bryce Canyon National Park. Two state highways maintained by UDOT provide primary access to the park. Most of the land surrounding Bryce Canyon National Park is Federal Lands managed by the National Forest Service and the Bureau of Land Management. Dixie National Forest lies to the west of Bryce Canyon National Park while Grand Staircase-Escalante National Monument lies to the east.

Regional Communities	<ul style="list-style-type: none"> <li>Bryce Canyon City, UT</li> <li>Tropic, UT</li> </ul>	<ul style="list-style-type: none"> <li>Panguitch, UT</li> </ul>
US Forest Service	<ul style="list-style-type: none"> <li>Dixie National Forest</li> </ul>	
UDOT	<ul style="list-style-type: none"> <li>State Highway 12</li> <li>State Highway 22</li> </ul>	<ul style="list-style-type: none"> <li>State Highway 63</li> </ul>

## ..... TRANSPORTATION RELATED PARTNERSHIPS

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

Existing Partnerships	
U.S. Forest Service	Staffing and responding to wildland fires
U.S. Forest Service	Interpretive Information and services at the Red Canyon Visitor Center (USFS)
Glen Canyon NRA (NPS)	Emergency dispatch services
Garfield County Ambulance	Emergency medical services
Highway 12 All American Scenic Byway Committee	Public awareness
Southern Utah University	Educational outreach
Garfield County	Recycling and waste management
Bryce Canyon City	Providing a public transportation system staging and parking area
Utah Department of Transportation	Maintenance of state highways within park
Bryce Canyon Natural History Association (BCNHA)	A non-profit organization to aid the interpretive, educational and scientific activities of the NPS at Bryce Canyon National Park and the USFS on the Dixie National Forest. A portion of the profits from all bookstore sales are donated to these public land units. Since BCNHA's inception in 1961, donations have exceeded \$3.5 million.

## **CLIMATE FRIENDLY PARKS** .....

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Bryce Canyon National Park is in the CFP certification process.

## **PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS** .....

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

### **VISITOR EXPERIENCE**

- Noise from vehicles, especially buses and motorcycles negatively impact the soundscape. The park has implemented no-idling policies for commercial tour buses. The park has also discussed calculating carrying capacities at popular overlooks and trailheads providing opportunities to manage visitation in specific areas.
- Parking
  - In the busy months of July and August, primary parking lots fill up quickly and there is often a wait of 15 + minutes for parking.
  - Visitors often park along roadsides causing damage to resources.
  - Parking lot congestion impacts visitor satisfaction.
- Helpful Transportation Investments
  - Maintenance needs on trails due to steep terrain.
  - Bicycle paths are planned for the main areas of the park.
  - Alternative Transportation System has been a successful program to improve the experience.
- ITS and Communications
  - Principle forms of communication with visitors include the park newspaper, brochures and information packets, the Park website, and Twitter.

### **RESOURCE PROTECTION**

- Concentrated Impacts
  - Majority of viewpoints are within main amphitheater of park (the first 5 miles by road).
  - Vehicles often stop in the roadway for pictures of the Mule Deer, Pronghorn, and Utah Prairie Dogs.
  - Additional pullouts are planned.
- Alternative Transportation System
  - The shuttle system is heavily used with vehicles reaching capacity at peak times.
  - All modes of transportation cause some impact to the resources.
  - There are no bike lanes on the road due to the narrow road.
  - Astronomy Festival and Geology Festival both occur during peak season.
- Resources at Risk from Transportation Impacts
  - Animal collisions are a problem for the park.
  - Noise from helicopters, propeller planes, motorcycles, shuttle/tour buses, RVs, and other vehicles.
  - Concerned with carrying capacity of locations within park.
  - Historic Districts.
  - Historic Structures.
  - National Landmarks.
  - Cultural, Natural and Scenic Landscapes.

### **SUSTAINABLE OPERATIONS**

- Reducing Carbon Emissions
  - ATS reduces carbon emissions by removing approximately 30% of visitors' vehicles from park.
  - Park is purchasing hybrid vehicles.
- Policy
  - Recreation and transportation fees are lumped together, creating a disparity in funding allocations.



# Chickasaw National Recreation Area

## (CHIC)

CHIC









# CHICKASAW NATIONAL RECREATION AREA (CHIC)

## AT A GLANCE

**STATE:** Oklahoma **SIZE:** 16 square miles **TYPE:** Rural

CHIC

### ROADWAY/PARKING CONDITION (CYCLE 4)

	PCR	DM	Lane Miles	Area/Spaces
Roadways	81 / FAIR	\$3.2 Million	40	–
Parking	68 / FAIR	\$1.7 Million	–	915,000 SF / 1,500
Replacement Value of All Transportation Assets			\$64.2 Million	

Asset Management

### CONGESTED AREAS

- Boat launching areas
- Intersection Hwy 177/7
- Lack of bike/pedestrian facilities
- Parking
- Campgrounds

### ALTERNATIVE TRANSPORTATION SYSTEM

Annual Boardings	no transit
Fuel Type	–

### FEES

Transportation Fee	No
FLREA (% retention)	100%

Mobility, Access,  
& Connectivity

### VISITATION (2010)

Total Visitors	2,586,000
Non-Recreation Visitors	1,332,000
Recreation Visitors	1,254,000
10-Year Trend	-17.8%

### VISITOR EXPERIENCE QUALITY SCORE

Roads	Parking	Date
Not Rated	79	2005

(University of Idaho Survey)

### TOP ACTIVITIES

- Swimming
- Picnicking
- Hiking/walking
- Boating

Visitor Experience

### AT-RISK RESOURCES

- Water quality
- Cultural resources
- Vegetation

### TRANSPORTATION/RESOURCE ISSUES

- Unauthorized parking/soil compaction
- Wildlife/vehicle collisions
- Low water crossings

Air Quality Status	Not Monitored/Regulated
--------------------	-------------------------

Resource  
Protection

### KEY PARTNERS

- Friends of Chickasaw
- Town of Sulphur
- City of Davis
- ODOT/Division 7

Climate Friendly Park Status	GHG Baseline
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Green House Gas Emissions	615 Metric Tons
---------------------------	-----------------

(CLIP)

Sustainable  
Operations

### Key Transportation Findings and Challenges

<b>Asset Management</b>	Average roadway pavement condition rating is 81, an increase of 30 points from Cycle 3, indicating Fair conditions, the fourth worst among Focus Parks.
	\$5.1 M in deferred maintenance of transportation assets.
	100% of public parking areas are in Poor or Fair Condition, with a 7 point decrease from Cycle 3 to Cycle 4.
	No fees are collected from non-recreational visits, which presents a maintenance challenge for the park.
<b>Mobility, Access, &amp; Connectivity</b>	The park is one of the most popular recreational destinations in a state with few public land alternatives.
	The high number of non-recreational trips, including truck traffic, on access roads not under NPS administration indicates the need to develop stronger relationships with city, county, and state agencies to develop solutions that are mutually beneficial. Wildlife impacts are also particularly notable.
	Pedestrians and bicyclists use the same narrow and congested roads as general traffic and trucks, leading to significant safety concerns.
	Multiple entrances limit the ability of the park to manage visitors.
	Severe parking shortages during peak season.
	47% of collisions occur with a fixed object, many in parking areas.
	Over 1,000 large vehicles (RVs) visit monthly during peak season.
<b>Visitor Experience</b>	2010 Recreation Visitation 1,253,637 (Medium).
	No visitor center.
	Recreational visitation dropped 2.7% annually 2001-2010.
	Boat launching, camping, and parking areas are congested.
	US Highway 177 is perceived as unsafe with higher speeds, large numbers of trucks, and poor geometry.
<b>Resource Protection</b>	52% of visitation is non-recreational resulting from through trips on US Highway 177.
	Protection of water quality from complex geological and hydrologic features is key to maintaining park mission. Water quality impacts from watercraft threaten pristine waters.
	Low water crossings in Platt District impact water quality and are not desirable from an environmental/runoff standpoint.
	The Platt National Park Historic District recently became a National Historic Landmark and is significant due to its CCC era designed landscape. 21% of roadway lane miles and 26% of parking areas are designated as historic.
	Vehicle crashes with deer on the higher speed through routes (US 177) endanger visitors and wildlife.
<b>Sustainable Operations</b>	Unauthorized parking contributes to social trailing, compaction of soils, and damage to vegetation.
	An active group of local and regional partners is important in developing programs, plans, and alternatives for the park.
	The park seeks stronger partnerships to manage non-NPS access roads.
	Climate Friendly Park certification in process.

## MISSION

Chickasaw National Recreation Area exists as part of the National Park System to provide for the protection of the park's unique resources, springs, streams, lakes and other natural features, its cultural history and structures, as well as its recreational resources and built facilities; and to provide for the public education, appreciation and recreational use and enjoyment of those resources.

Park Website: [www.nps.gov/chic](http://www.nps.gov/chic)

## PARK DESCRIPTION

Freshwater recreation and the hope of cures from the area's mineral springs along Travertine Creek led to the establishment of the Chickasaw National Recreation Area in south-central Oklahoma. Originally known as Sulphur Springs Reservation and later renamed Platt National Park (1906-1976), the park was established in 1902 through an agreement with the Chickasaw and Choctaw Nations and the federal government. The Chickasaw Nation sold the land to the government in order to protect the unique freshwater and mineral springs along Travertine and Rock Creeks.

The larger Chickasaw National Recreation Area encompasses the 900-acre Platt Historic District in the northeastern Travertine Creek area, as well as the Lake of the Arbuckles to the west. The Platt Historic District relates to the early period of the park's establishment, when much of the park infrastructure was constructed by the Civilian Conservation Corps (CCC).

The Oklahoma Department of Wildlife Conservation rated the Lake of the Arbuckles as the best for bass fishing in the state. Thirty-six miles of shoreline and protective coves are good for trotlines, the water is unusually clear, and trolling is popular.

Chickasaw National Recreation Area lies in a transition zone where the Eastern deciduous forest and the Western prairies meet. It has flora and fauna from both environments, and other flora and fauna specific to such transition areas. Travertine Creek is the focus of the Platt Historic District, from its source as a spring to its juncture with Rock Creek. A unique feature of this stream is its ability to form an unusual rock called travertine.

## PARK LOCATION

Chickasaw National Recreation Area has six primary park entrances off several regional highways, including Oklahoma State Highways 7 and 110, and US 177. The primary internal park road is Perimeter Drive. Chickasaw National Recreation Area is 85 miles from Oklahoma City. The park is located approximately 145 miles from Dallas/Fort Worth; 245 miles from Wichita, KS; and 315 miles from Little Rock, AR.

Nearby National Park Service units include:

- Washita Battlefield NHS (225 miles)
- Hot Springs NP (260 miles)
- Fort Smith NHS (215 miles)
- Alibates Flint Quarries NM (275 miles)

## TRANSPORTATION OVERVIEW

Chickasaw National Recreation Area is characterized by a relatively narrow area which provides a buffer around the Lake of the Arbuckles and several creeks which feed the lake. Multiple park entry points convey visitors to waterways where they can enjoy or view aquatic activities.

There is no internal roadway that allows vehicular connectivity through the park. Vehicles must exit the park and drive on surrounding highways to view the different districts and attractions.

The main entrances used to access the park include Buckhorn Road in the Arbuckle District and Northeast Drive and Northwest Drive in the Platt District. The Platt District lies on the northeast corner of the property and the Arbuckle District encompasses the southern majority of the property.

Chickasaw National Recreation Area offers roadway and parking assets within the park. The roadway network is approximately 40 lane miles in length on 46 different routes and 915,000 square feet (21 acres) of parking infrastructure. Non-motorized transportation routes connect the Platt District to the northern side of the Arbuckle District.

## ASSET MANAGEMENT

The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Chickasaw National Recreation Area transportation assets is \$64.2 million.

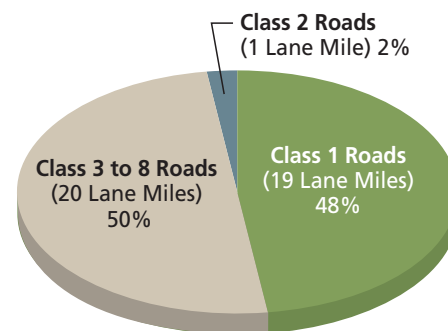
### Chickasaw National Recreation Area Roadway and Parking Assets

- Approximately 40 lane miles roadway.
- Approximately 915,000 square-feet (1500 spaces) of parking is provided in 70 identified parking areas.

### ROADWAY ASSETS

About one-half of Chickasaw National Recreation Area roadways are classifications 1 or 2. However, 50 percent is a rather high percentage of roadways classified as Class 3 to 8 compared to other IMR focus parks. Most of the Class 3 & 4 roadways are found within the Buckhorn Area within the Arbuckle District.

TOTAL LANE MILES = 40



### ROADWAY PAVEMENT RATING CONDITION (PCR)

Campground roads are most likely to be in poor condition in Chickasaw. Overall, the average PCR for all roadways within the park is 81, fair condition.

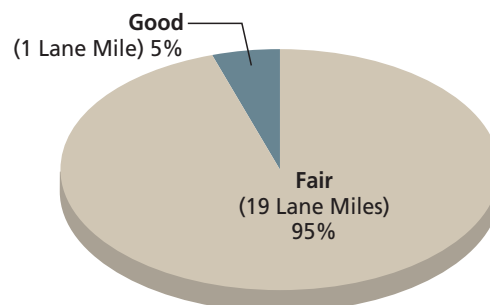
Roadway Type	Average PCR*
All Roadways	81 - FAIR
Class 1	83 - FAIR
Class 2	79 - FAIR
Class 3 to 8	76 - FAIR

\*Cycle 4 RIP data

### CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

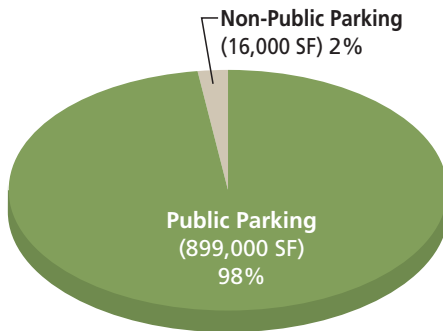
Compared to the other IMR snapshot parks, Chickasaw National Recreation Area has the fourth worst rated Class 1 and 2 lane miles. The majority of Class 1 or 2 roadway have a fair rating.

TOTAL LANE MILES = 20



## PARKING ASSETS

TOTAL SQUARE FEET = 915,000



Almost all parking assets are public. The only non-public parking areas are located at the park headquarters and the park maintenance area. Park Headquarters are located outside of the park in the City of Sulphur. There are approximately 1,470 public parking spaces and 30 non-public parking spaces.

## PARKING PAVEMENT CONDITION RATING (PCR)

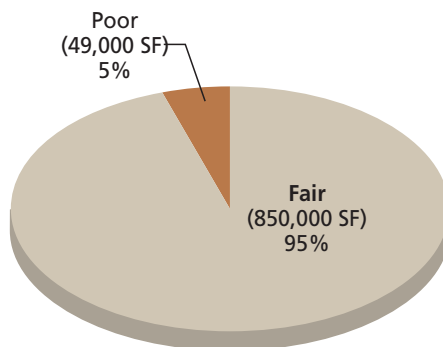
Parking Type	Average PCR*
Public Parking	72 - FAIR
Non-Public Parking	64 - FAIR
All Parking	68 - FAIR

\*Cycle 4 RIP data

Parking asset conditions currently rate better than Roadway asset conditions.

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

TOTAL SQUARE FEET = 899,000



The average PCR for public parking assets is fair. Ninety-five percent of these areas are in fair condition. Park-wide, public parking areas contain approximately 1,390 spaces (850,000 square feet) in fair condition. The remaining 80 spaces (49,000 square feet) are in poor condition.

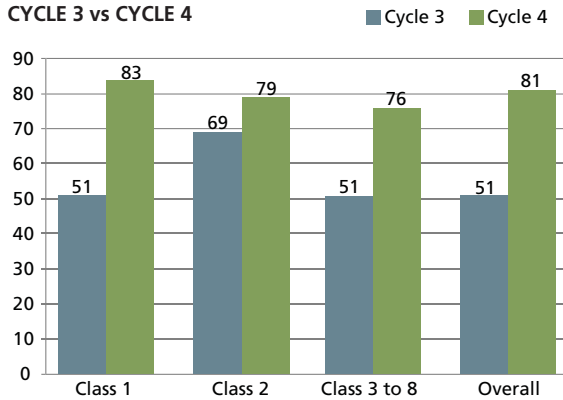
## ASSET CONDITIONS OVER TIME

The most recent cycle of RIP data available for Chickasaw roadways and parking is Cycle 4. A comparison of Cycle 3 and Cycle 4 asset data provides a snapshot of the roadway and parking conditions at Chickasaw National Recreation Area over time. The conditions are shown in the following tables. Between 2006 and 2012, the roadway pavement conditions within the park showed an overall improvement from an average PCR of 51 to 81. The parking conditions degraded from an average PCR of 75 to 68.

### ROADWAY ASSETS

All roadway classifications show improved average conditions from Cycle 3 to Cycle 4. In most cases the average condition improved from poor to fair. Class 1 and the overall average condition are approaching a good rating.

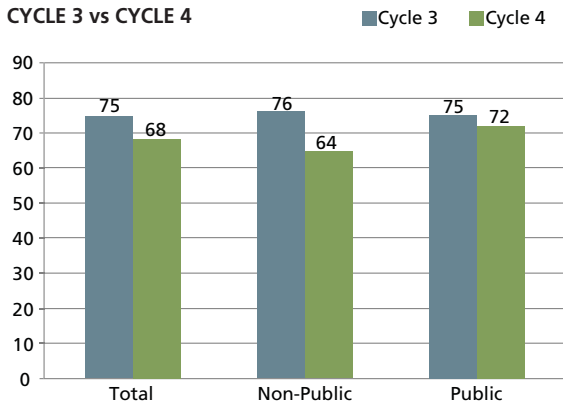
**ROADWAY CONDITIONS**  
CYCLE 3 vs CYCLE 4



### PARKING

All parking areas show a slight degradation in average condition from Cycle 3 to Cycle 4. Non-public parking areas experienced the greatest degradation.

**PARKING CONDITIONS**  
CYCLE 3 vs CYCLE 4



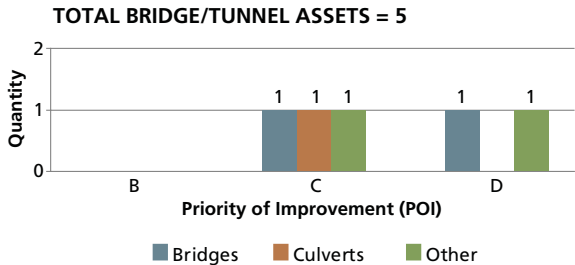
## TRANSPORTATION TRAILS

The park contains no trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities."



BRIDGE AND TUNNEL ASSETS

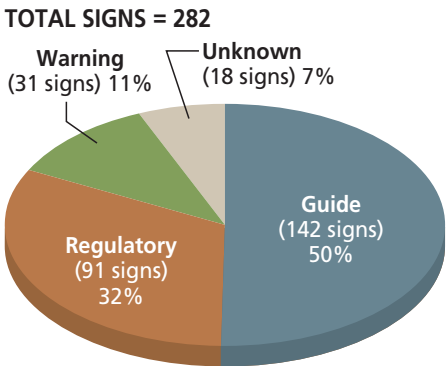
Bridge and Tunnel Asset  
Quantity and Condition



Chickasaw National Recreation Area contains five bridges and culverts, but no tunnel assets. All structures have a POI of C or D indicating no immediate maintenance is necessary.

TRANSPORTATION SIGN ASSETS

Sign Asset Quantity and Condition



Chickasaw National Recreation Area roadways and parking areas contain 282 transportation signs. Approximately 50 percent of the signs are guide signs meant to direct visitors to the desired destinations. Forty-three percent of the signs are regulatory and warning signs. The remaining 7 percent (18 signs) have unknown types since the signs are either missing or unreadable.

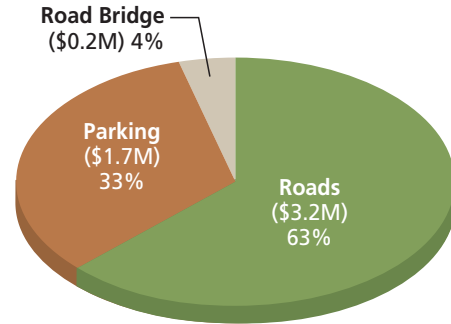
Condition	Quantity
Good	258
Fair	2
Poor	4

## DEFERRED ASSET MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Deferred maintenance within Chickasaw National Recreation Area totals \$5.1 million.
- The majority of deferred maintenance is associated with park roadways.
- Roadways and parking constitute approximately 96 percent of the park's total deferred maintenance for transportation assets.
- Previous Cycle 3 data also included \$1.2 million of deferred maintenance for trails. Trails data was not provided for Cycle 4/5.

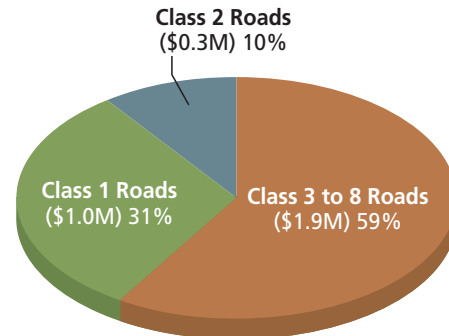
**TOTAL DEFERRED MAINTENANCE = \$5.1M**



## DEFERRED ROADWAY MAINTENANCE

- The majority of roadway deferred maintenance in Chickasaw National Recreation Area is associated with the Class 3 to 8 roadways.
- Class 1 roadways account for 48 percent of lane miles but only 31 percent of deferred maintenance.

**TOTAL DEFERRED MAINTENANCE = \$3.2M**



## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks, and in Chickasaw National Recreation Area, has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. Not all facilities that serve to connect the region and the nation to the park are owned or operated by NPS. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Some pieces of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

### .....ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

Chickasaw National Recreation Area does not provide ATS services within the park.

### .....MULTI-MODAL CONNECTIVITY

Chickasaw National Recreation Area provides one multi-use trail system. This is not a defined Transportation Trail for the purposes of this analysis; however, it provides useful connectivity. The unpaved segments of the Rock Creek Multi-Use Trail connect the Buckhorn area of the Arbuckle District with the Platt District along Rock Creek. Narrow roads in the Platt Historic District create unsafe conditions for cyclists, whose numbers are increasing.

From the town of Sulphur, pedestrians have five access point to the park trail system, which was designed to provide access to the entire park. In the Platt Historic District, pedestrians walk in the road as no sidewalks are available. A wider and improved pedestrian passage to cross state Hwy 177, as well as a two-way road from Sycamore Crossing to the nature center and back would reduce congestion and improve pedestrian safety.

### .....RAIL

#### CHICKASAW TRANSPORTATION HIGHLIGHT

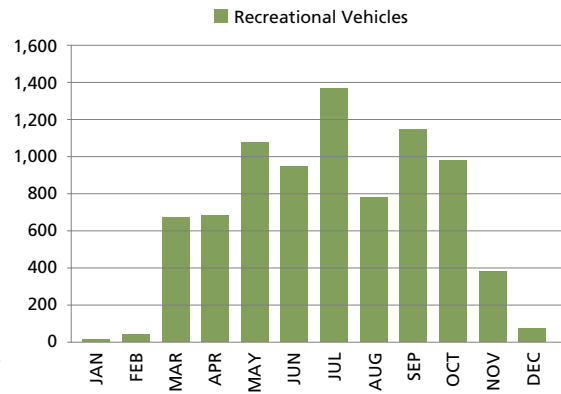
"Trails & Rails" is a partnership between the National Park Service and Amtrak to provide on-board education programs. Volunteers act as tour guides and provide Amtrak passengers with information while aboard the Heartland Flyer. The daily round trip travels between Oklahoma City and Fort Worth, with a stop in Sulphur, the gateway to Chickasaw. During their train ride, passengers will be introduced to the rich and diverse cultural heritage of Oklahoma and Texas; the history of the area; the geological story of these areas; descriptions of the Oklahoma and Texas landscape and its animals and plants; the economic story; and the role of the railroad in the areas.

## CONGESTION

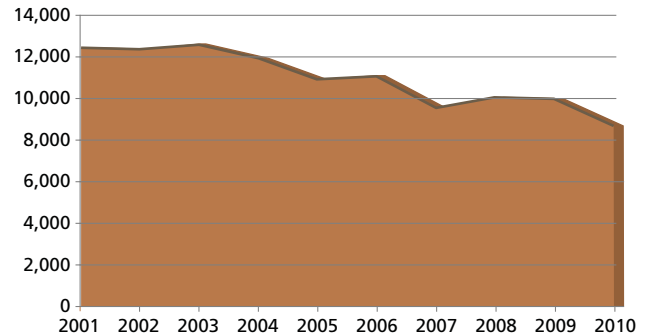
The number of vehicles entering Chickasaw National Recreation Area decreased from 2002 to 2010. The peak visitation month in 2010 was May. Chickasaw National Recreation Area welcomes approximately 7,180 vehicles on a peak visitation day.

During peak season, over 1,000 buses and RVs visit Chickasaw National Recreation Area in a month. The volume of commercial tour buses to enter Chickasaw National Recreation Area is not available but it is expected that the number of RVs greatly outnumbers the volume of commercial tour buses. The number of RVs entering the park appears to be decreasing based on the number of overnight RV stays in the park.

RV Vehicles



Annual RV Overnights



## CONGESTION LOCATIONS

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff did not provide responses to identify congested areas within the park.

## CONGESTION MITIGATION STRATEGIES

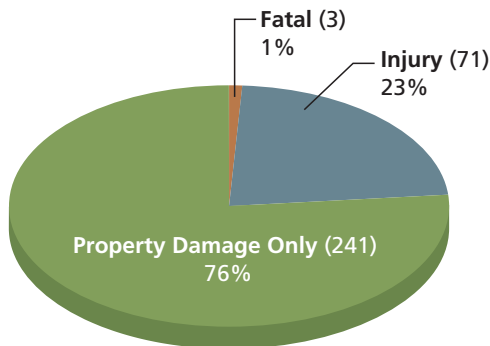
Park staff did not identify congestion mitigation strategies used within the park in the 2010 Service-wide CMS survey.

## ITS STRATEGIES

Park staff did not identify ITS congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey.

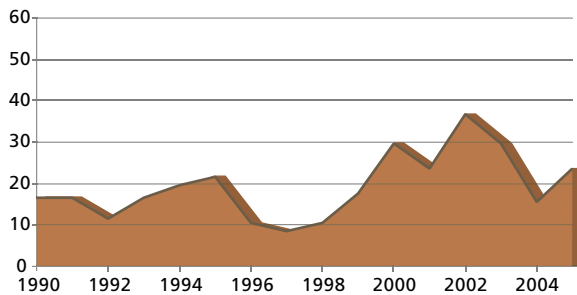
## CRASH SEVERITY

TOTAL CRASHES = 315



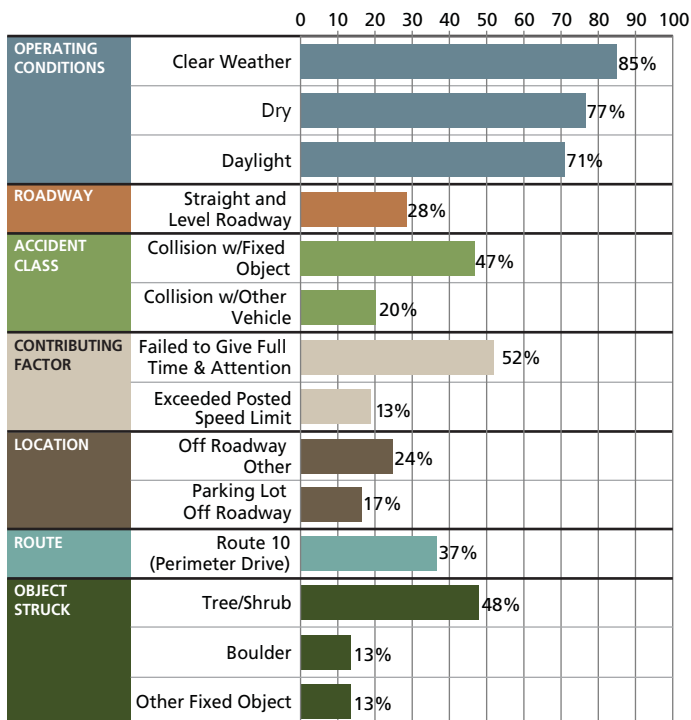
Chickasaw National Recreation Area experienced 315 crashes between 1990 and 2005. As with other parks, the majority of crashes are Property Damage Only. However, Chickasaw National Recreation Area has a slightly higher proportion of injury crashes than other parks.

## ANNUAL CRASHES



Chickasaw National Recreation Area averages approximately 20 crashes per year. The current long term trend indicates crashes are increasing by approximately 3.5 percent per year. Annual crash totals vary by fewer than 30 crashes per year. The crash rates within Chickasaw National Recreation Area have not been identified as higher than expected based on State of Oklahoma crash experience.

## CRASH CONDITIONS



Nearly half of the crashes are collisions with fixed objects, including cultural resources such as bridges, buildings, etc. An additional one in five crashes involves another vehicle. About one-quarter of crashes occur in parking lots. Almost half of crashes result from drivers failing to give full attention. Only one-quarter of crashes occur on straight and level roadway. Weather conditions do not appear to be a contributing factor.

## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information NPS collects about visitors and points the way with state-of-the art programs and systems that enhance every visit to Chickasaw National Recreation Area.

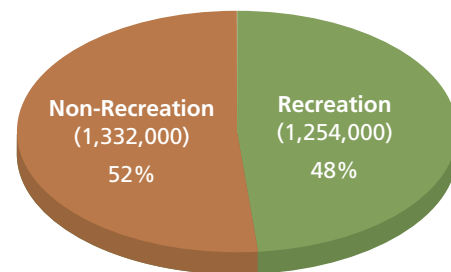
### 2010 VISITATION

Chickasaw National Recreation Area had approximately 1,254,000 recreational visitors in 2010. Between 2000 and 2010, recreational visitation decreased by about 1.5 percent per year.

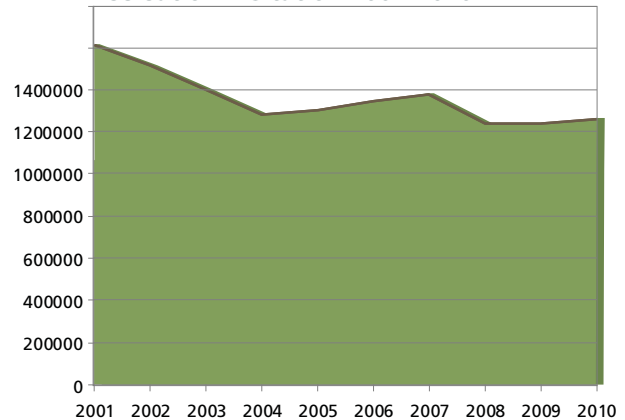
About 52 percent of park traffic is non-recreational, with approximately 1,332,000 non-recreation visitors in 2010. The majority of non-recreational trips are through traffic on US 177 and Goddard Youth Road. The non-recreational visitation has also decreased between 2000 and 2010, by 1.9 percent per year.

### 2010 VISITATION

**TOTAL VISITORS = 2,856,000**

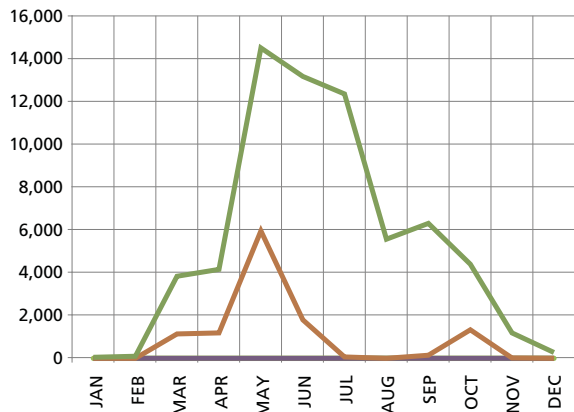


**Recreation Visitation 2001-2010**

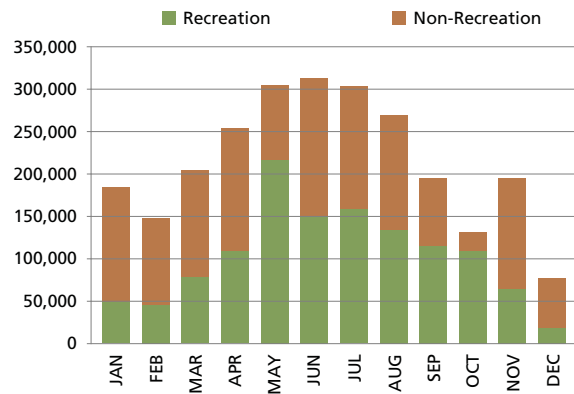




Overnight Stays By Month

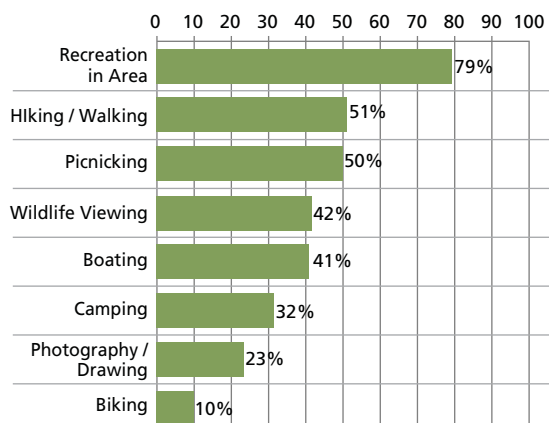


Visitors By Month



Chickasaw National Recreation Area does not have a park lodge. The majority of overnight stays are at campgrounds, with over 12,000 overnight stays in the months of May, June and July.

## VISITOR ACTIVITIES

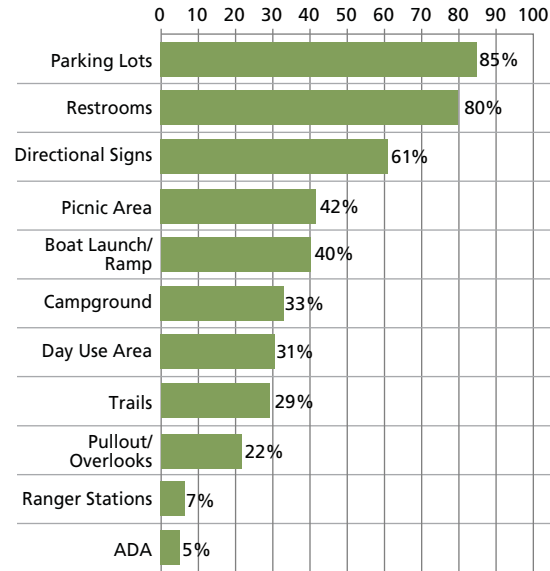


A majority of Visitors to Chickasaw National Recreation Area indicate that they recreate in the area, hike/walk and picnic during their park visit. Visitors also view wildlife, boat, camp and take photos or draw while visiting Chickasaw National Recreation Area.

The park pavilions, campgrounds, picnic areas, and dams of the Platt Historic District were built by the CCC in the 1930s. Photography, drawing, and wildlife viewing are also popular activities. Hunting is allowed in the park. The mineral waters in Travertine Creek have created interesting ledges of porous deposits to explore, and the Lake of the Arbuckles is generally known as one of the best fishing lakes in Oklahoma. The Oklahoma Department of Wildlife Conservation rated the lake as the best for bass fishing in the state.

## VISITOR SERVICES USED

Visitors to Chickasaw National Recreation Area “get to use two parks in one” – the Platt Historic District and the Lake of the Arbuckles District. Picnic areas and pavilions over the springs furnish settings for family reunions and campgrounds provide overnight stays. A majority of visitors indicate they use parking lots, restrooms and directional signs while visiting the park. Over a third of visitors use picnic areas, boat launches/ramps and campgrounds. Only about 5 percent of visitors use ADA facilities.



## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP completed in 2012. Report to be published in 2013. The previous survey was completed in 2005.
- 2010 CMS Survey – Chickasaw National Park did not participate
- Surveys & Interviews, 2011
  - Congested locations: parking areas, boat ramps, campground areas, other (Platt Historic District)
  - Strategies: trails, bike paths, regular maintenance of roads and trails, parking lot striping, overflow parking areas, two way road system, road widening, traffic calming devices and signs

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in Chickasaw National Recreation Area.

The purpose of Chickasaw National Recreation Area is to protect the springs and waters; preserve areas of archeological or ethnological interest; provide outdoor recreation; protect scenic, scientific, natural, and historic values; and memorialize the Chickasaw Indian Nation.

### ..... AIR QUALITY AND GHG EMISSIONS

The Park had completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

#### Mobile GHG Emissions

Park Operations (MTCO <sub>2</sub> E)	268.0
Visitors (MTCO <sub>2</sub> E)	615.0
Concessionaires (MTCO <sub>2</sub> E)	0.0
Total Mobile GHG Emissions	615.0

*Climate Leadership In Parks*

### ..... SIGNIFICANT RESOURCES

- Chickasaw National Recreation Area contains mineral and fresh water, which comes from one of the most complex geological and hydrological features in the United States.
- The cultural landscape of the proposed Platt National Park Historic District in Chickasaw National Recreation Area reflects the primary era of 1933–1940, when the Civilian Conservation Corps implemented National Park Service “rustic” designs. This is one of the most intact landscapes of that period.
- 21% of the park’s roads and 26% of parking area is listed as historic.
- Recreational opportunities are available to experience a wide range of outdoor activities — swimming, boating, fishing, hiking, observing nature, hunting, camping, bicycling, horseback riding, family reunions, and picnicking — all of which remind us of the rural character in the history of the American people.
- Chickasaw National Recreation Area is home to a transition zone where the eastern deciduous forest meets the western prairies, which is unique to the central part of the United States.
- The long history of Chickasaw National Recreation Area exemplifies the evolution of the American conservation movement and the national park system. The significance of naming the area “Chickasaw” is meant to memorialize the foresight that this Indian tribe showed when they agreed to protect the natural freshwater and mineral water resources of this area through public government ownership over private ownership.

### ..... THREATENED & ENDANGERED SPECIES

There are no threatened or endangered wildlife or plant species reported for this park.

## SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Chickasaw National Recreation Area is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

### REGIONAL AND COMMUNITY STAKEHOLDERS .....

Chickasaw National Recreation Area is located adjacent to the I-35 corridor between Oklahoma City and Dallas-Fort Worth. The town of Sulphur, OK, is the gateway community. The town provides many services for visitors to the area. Very few other Federal Lands are located near Chickasaw National Recreation Area.

Regional Communities	Sulphur, OK Davis, OK Ada, OK
USFWS	Tishomingo NWR
US DOT (FHWA), OKDOT and Oklahoma Turnpike Authority	I-35 US 177 SH 7 SH 110 Chickasaw Turnpike

### TRANSPORTATION RELATED PARTNERSHIPS .....

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

Existing Partnerships	
Sulphur, City of Davis, and Chambers of Commerce	Traffic (especially truck traffic), safety, and congestion are major concerns for the park and the Town of Sulphur. Additional opportunities should be explored.
The Chickasaw Nation	Has a cultural center adjacent to the park. Is a big player and wants a bigger role in park management.
Friends of Chickasaw National Recreation Area	Promote public appreciation of and support for Chickasaw National Recreation Area. This support includes conducting interpretive programs, increasing public awareness regarding the park and its mission, fundraising, and other volunteer activities.

### CLIMATE FRIENDLY PARK

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Chickasaw National Recreation Area has begun steps to obtain certification.

..... **PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS**

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

**ASSET MANAGEMENT**

- County roads accessing the park are in poor condition, but are neglected by authorities since much of the traffic is park-related. No funds seem to be available to address the situation.

**VISITOR EXPERIENCE**

- Capacity and Congestion
  - Boat launching areas are congested and lack adequate amenities.
  - The roadways in the Platt District were not built to accommodate RV traffic.
  - Highway 177 perceived as unsafe. Has high speeds, higher heavy vehicle volumes (semis), is narrow and has curves. Traffic backups occur at intersection of Highways 177/7, with trucks needing extra time and space to navigate the tight radius. The highway also serves as a weigh station bypass, creating heavy truck traffic.
  - Other smaller roads are difficult for larger vehicles to navigate, especially when pulling trailers.
  - Wayfinding support and signage is lacking to direct visitors around the park.
  - Heavy boat traffic on Lake of the Arbuckles impacts visitor experience.
- Parking
  - The number of visitors overwhelms the resource, especially camping areas and parking which are very crowded during peak times. There is a significant impact on Visitor Experience.
- Bicycles and Pedestrians
  - A high number of pedestrians walk in the road - no sidewalks are available.
  - The Park would like to accommodate additional multi-use facilities in the future. Would like to be more bicycle friendly.
  - Safety improvements are needed for pedestrians, especially as they try to cross State Hwy 177.
  - Would like to reopen the Arbuckle District overlook which has been closed since 2001.
- Visitor Diversity
  - Recent growth in Hispanic visitors creates a communication challenge.

**RESOURCE PROTECTION**

- Concentrated Impacts
  - Unauthorized parking on road shoulders contributes to vegetation impacts.
- Resources at Risk from Transportation Impacts
  - Work needs to be done to tie carrying capacity to facilities and resources.
  - Low water crossings in Platt National Historic District are not considered acceptable from an environmental/runoff stand point.
  - Large number of animal/vehicle collisions.
  - Known for high quality water resources, springs, and artesian wells.

**SUSTAINABLE OPERATIONS**

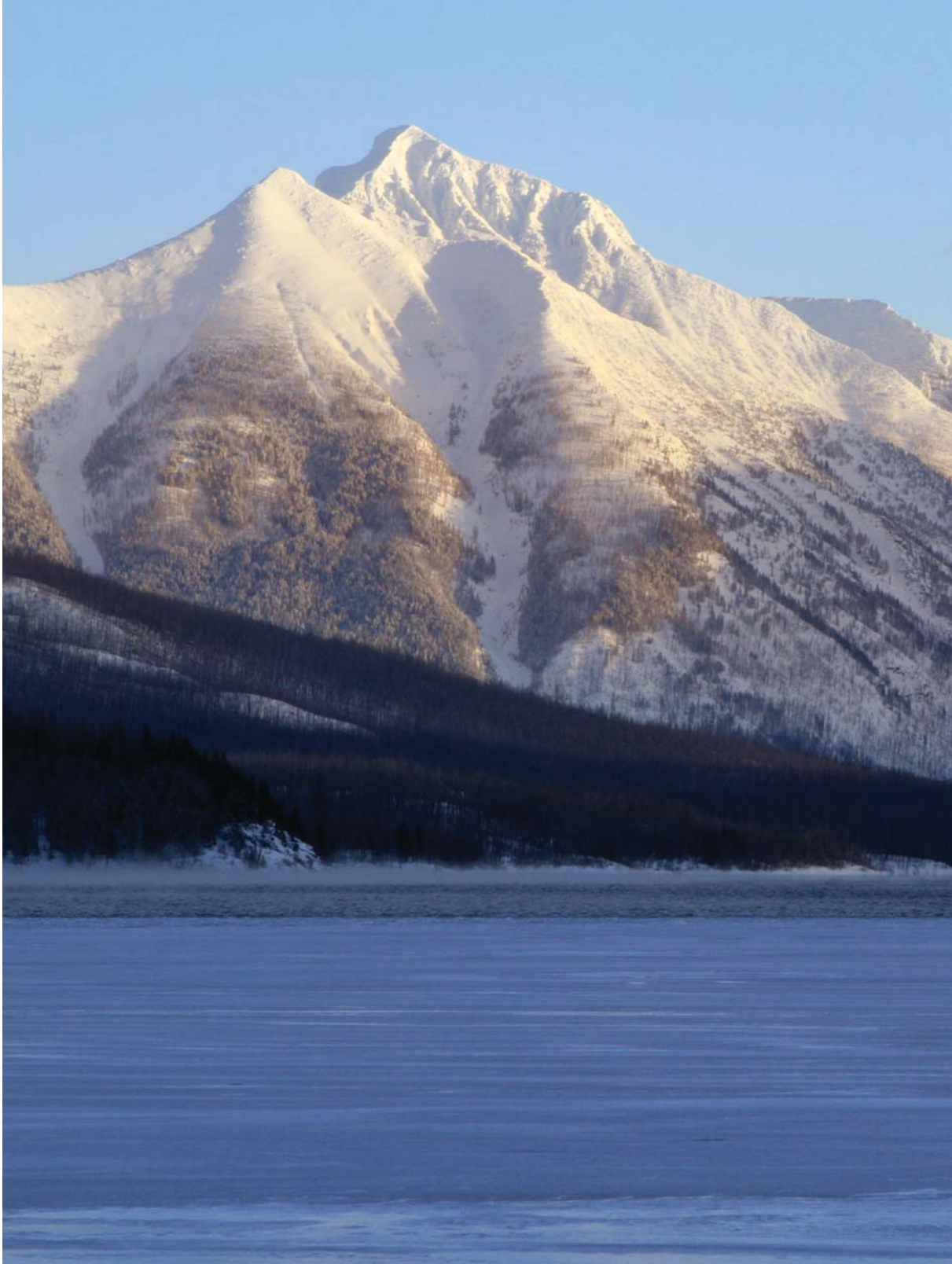
- Operations
  - There is no entrance fee for the Park, partly due to the many (10) park entrances, leaving it short of funds for needed maintenance and improvements.
  - Need better pre-trip planning information services to orient visitors to resources and opportunities. The website, Facebook, and Twitter are used, but many arrive without adequate information.
  - A Visitor Center is planned, but has not been funded.
- Reducing Carbon Emissions
  - Programs in place to improve energy efficiency buildings and lighting, reduce vehicle fuel consumption and utility costs, recycle visitor generated aluminum and plastic, and recycle park generated cardboard, paper, aluminum, steel and copper. CHIC contributes old picnic table frames and grills to local parks and gives trees and limbs to the City of Sulphur for the production of landscape mulch.
  - The park utilizes five electric utility vehicles and three hybrid cars.

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# Glacier National Park

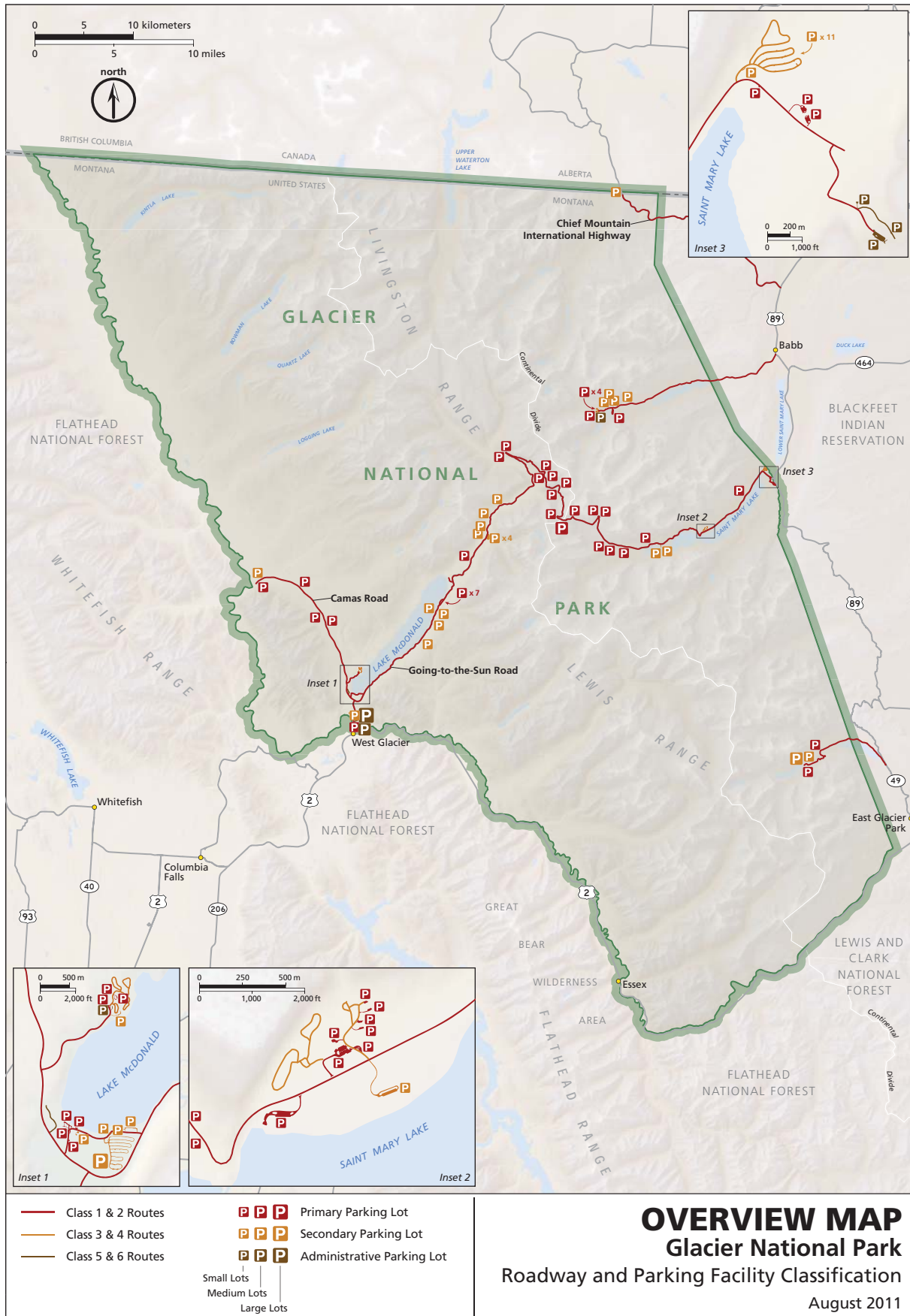
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INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT

GLAC



# GLACIER NATIONAL PARK (GLAC)

## AT A GLANCE

**STATE:** Montana **SIZE:** 1,583 square miles **TYPE:** Rural

ROADWAY/PARKING CONDITION (CYCLE 4)					Asset Management	
	PCR	DM	Lane Miles	Area/Spaces		
Roadways	82 / FAIR	\$60.6 Million	231	–		
Parking	75 / FAIR	\$6.6 Million	–	1,650,000 SF / 2,705		
Replacement Value of All Transportation Assets			\$562.6 Million			
					Mobility, Access, & Connectivity	
CONGESTED AREAS			ALTERNATIVE TRANSPORTATION SYSTEM			
<ul style="list-style-type: none"><li>• Park Entrance Stations</li><li>• Shuttle Loading Areas</li><li>• Visitor Centers</li><li>• Shuttle Capacity</li></ul>			Annual Boardings	171,000		
			Fuel Type	Biodiesel		
			FEES			
			Transportation Fee	\$7.50		
			FLREA (% retention)	80%		
					Visitor Experience	
VISITATION (2010)			VISITOR EXPERIENCE QUALITY SCORE			
Total Visitors	2,218,000		Roads	Parking		Date
Non-Recreation Visitors	18,000		–	–		no survey
Recreation Visitors	2,200,000		(University of Idaho Survey)			
10-Year Trend	+31.4%		TOP ACTIVITIES			
			<ul style="list-style-type: none"><li>• Sightseeing/Scenic drive</li><li>• Hiking/Wildlife</li></ul>			
					Resource Protection	
AT-RISK RESOURCES			TRANSPORTATION/RESOURCE ISSUES			
<ul style="list-style-type: none"><li>• Scenic views</li><li>• Wildlife</li><li>• Glaciers</li><li>• Alpine ecosystem</li><li>• Soundscape</li><li>• Cultural resources</li></ul>			• Diesel bus noise			
			• Concentrated impacts at shuttle stops			
			MAJOR HISTORIC TRANSPORTATION ASSET			
			<ul style="list-style-type: none"><li>• Going-to-the-Sun Road</li><li>• Lake MacDonald Lodge Area/Bridge</li></ul>			
Air Quality Status			Monitored*		Sustainable Operations	
*see page 67						
KEY PARTNERS						
<ul style="list-style-type: none"><li>• Glacier NP Associates</li><li>• Glacier NP Fund</li><li>• Glacier Association</li><li>• Glacier Institute</li><li>• MDOT/District 1</li></ul>						
Climate Friendly Park Status			Certified			
Green House Gas Emissions			11,040 Metric Tons			
					(CLIP)	

GLAC

### Key Transportation Findings and Challenges

<b>Asset Management</b>	60% of Class 1 & 2 roadway lane miles are in Good condition; 60% of public parking areas in Poor or Fair condition. Road PCR improved from 71 (Cycle 3) to 82 (Cycle 5).
	2 bridges meet guidelines for immediate repairs.
	\$77.2 M in deferred maintenance of transportation assets, about 9% of total IMR DM.
	High long term shuttle operation costs may endanger the future of the system, causing trade-offs in mobility, resource protection, and visitor experience.
<b>Mobility, Access, &amp; Connectivity</b>	Significant congestion at park entrance stations, visitor centers, shuttle loading areas, and trailheads has spillover negative effects on natural resources and visitor experience.
	The popular shuttle system does help reduce vehicle congestion on Going-to-the-Sun Road. However, unintended effects of the shuttle's success include concentration of pedestrian traffic at shuttle stops, soils and vegetation damage from social trails in the alpine environment, vehicle noise, and crowding at trailheads.
	Over 12,000 large vehicles (RVs) visit monthly during peak season, contributing to safety, parking, and congestion hazards.
	58% of crashes occur on Going-to-the-Sun Road.
<b>Visitor Experience</b>	2010 Recreation Visitation 2,200,048 (Large) .
	Recreational visitation grew 3.0% annually 2001-2010.
	Going-to-the-Sun Road is often congested, including parking.
	Logan Pass shuttle is crowded, with 45-60 minute wait times at many stops.
<b>Resource Protection</b>	Parking congestion at Apgar Village is a frequently expressed concern.
	Transit pulsing effects at the limited, high altitude parking areas and shuttle stops contribute to social trailing, compaction of soils, and damage to fragile tundra ecologies. Approximately 3,000 visitors per day at Logan Pass contribute to negative resource impacts.
	Clean air, dark skies, and the soundscape are critical to achieving sustainability and visitor experience goals. Impacts from vehicles, especially noisy diesel-powered buses, contribute to the degradation of these resources. While the park is making strides to convert its diesel fleet, the many tour buses are predominantly diesel-powered.
	Cultural resources at risk from increased visitation and aging of historically significant features associated with GTSR and other structures. 35% of roadway lane miles are designated as historic, including the Going-to-the-Sun Road (a National Historic Landmark) and associated bridges, including the Lake MacDonald area.
<b>Sustainable Operations</b>	Climate Friendly Park Certified.
	The park has major snow removal and other high altitude maintenance challenges. Although alternative fuel buses would be desirable, no vehicles have been identified that operate successfully at the high altitude and on the steep grades.
	There is a concentration of visitors at relatively few locations in the park.
	Cooperative agreement with Eagle Transit and Montana DOT to operate shuttle system.

## MISSION

The purpose of Glacier National Park is to preserve and protect the natural and cultural resources for future generations. The park also provides opportunities to experience, understand, and enjoy the park consistent with the preservation of resources in a state of nature. Unique to Glacier National Park is the celebration of ongoing peace, friendship, and goodwill among nations, recognizing the need for cooperation in a world of shared resources.



## PARK DESCRIPTION

Glacier National Park provides visitors the experience of pristine forests, alpine meadows, rugged mountains, and spectacular lakes in glacially-carved valleys. With over 700 miles of trails, the park is a hiker's paradise for adventurous visitors seeking wilderness and solitude. One of the most amazing highlights is a drive on the Going-to-the-Sun Road. This engineering marvel, a Historic Civil Engineering Landmark, spans 50 miles through the park's wild interior, winding around mountainsides, traversing Logan Pass, and treating visitors to some of the best sights in northwest Montana. Glacier National Park Shuttle serves the entire length of Going-to-the-Sun Road.

Historic chalets, lodges, and stories of Native Americans in the park are also part of the experience. Evidence of human use in this area dates back to over 10,000 years. By the time the first European explorers came into this region, several different tribes inhabited the area. The Blackfoot Indians controlled the vast prairies east of the mountains, while the Salish and Kootenai Indians lived in the western valleys, traveling over the mountains in search of game and to hunt the great herds of buffalo on the eastern plains.

Glacier National Park preserves more than a million acres of land. Its diverse habitats are home to nearly 70 species of mammals including the grizzly bear, wolverine, gray wolf and lynx. Over 270 species of birds visit or reside in the park, including such varied species as harlequin ducks, dippers and golden eagles. Glacier National Park's varied climate influences and its location as the headwaters of the Pacific, Atlantic and Hudson Bay drainages have given rise to an incredible variety of plants and animals.

## PARK LOCATION

Located in northwestern Montana at the Canadian border, Glacier National Park is adjacent to Canada's Waterton Lakes National Park. This affiliation is known as the Waterton-Glacier International Peace Park.

Glacier National Park covers approximately 1,585 square miles and has two primary park entrances and seven secondary entrances, which include an international entrance from Waterton, Alberta, Canada. The primary route within the park is Going-to-the-Sun Road.

Regional connectivity is by US 2, US 89, and US 93. Additionally, Montana State Highways 17, 40, 49, 206, and 464 connect visitors to the park, as well as Alberta, Canada highways 2, 5, and 6. Glacier National Park is 150 miles from Kalispell, 160 miles from Missoula, and 160 miles from Great Falls.

Nearby National Park Service Units include:

- Grant Kohrs Ranch NHS, MT (230 miles)
- Big Hole NB, MT (270 miles)
- Yellowstone NP, WY (485 miles)

## TRANSPORTATION OVERVIEW

Glacier National Park contains 231 lane miles of roadway assets, 1,650,000 of parking infrastructure and 753 miles of trails. The ATS includes several shuttle and bus routes, horseback trips, as well as boats for tours or rent.

The park has multiple park entrances with two serving a majority of visitors. Apgar and Saint Mary's entrances lie on either end of Going-to-the-Sun Road which is the primary route through the park and a National Historic Landmark. The southern boundary of the Park contains the paved State Highway 2 and the unpaved North Fork Road. These two roads weave inside the park boundary and just outside the park boundary. About 10 percent of visitors use the shuttle parking lots at either end of Going-to-the-Sun Road.

To help reduce congestion and address geometric constraints along Going-to-the-Sun Road, Glacier National Park has issued vehicle size restrictions. Vehicles, and vehicle combinations, longer than 21 feet (including bumpers) or wider than 8 feet (including mirrors), are prohibited between Avalanche Campground and the Rising Sun picnic area parking. Vehicle and vehicle combinations over 10 feet in height may have difficulty driving west from Logan Pass to the Loop, due to rock overhangs.

## ASSET MANAGEMENT

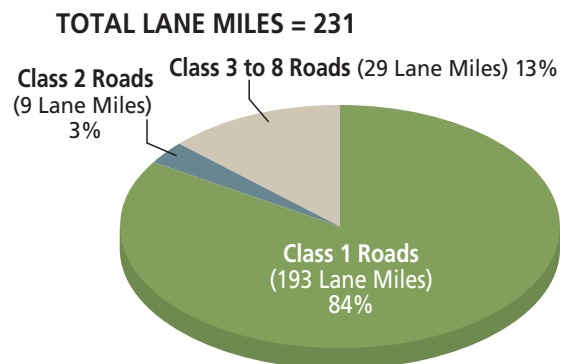
The IMR manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Glacier National Park transportation assets is \$562.6 million.

### Glacier National Park Roadway and Parking Assets

- Approximately 231 lane miles of roadway on 70 different routes.
- Approximately 1,650,000 square feet (2,705 spaces) of parking area provided in 134 identified parking areas.
- 202 lane miles are defined as Class 1 or 2 roads (87%).

### ROADWAY ASSETS

A majority (87%) of GLAC's 231 lanes miles of roadways are class 1 or 2. This is a significantly higher proportion of Class 1 & 2 roads compared to other focus parks. There are very few administrative (Class 5 & 6) roads within the Park.



### ROADWAY PAVEMENT CONDITION RATING (PCR)

The average PCR for all roadways within the park is 82, Fair conditions. The climate and short paving season at Glacier National Park make the pavement a challenging asset to maintain.

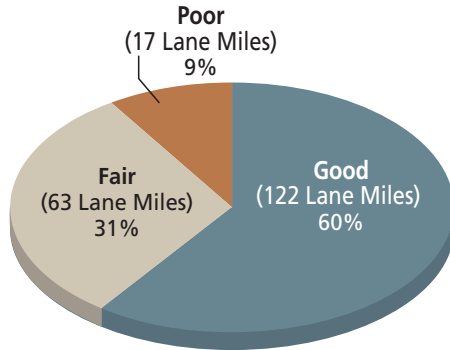
Roadway Type	Average PCR*
All Roadways	82 - FAIR
Class 1	84 - FAIR
Class 2	73 - FAIR
Class 3 to 8	71 - FAIR

\*Cycle 5 RIP data



## CLASS 1 & 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

TOTAL LANE MILES = 202

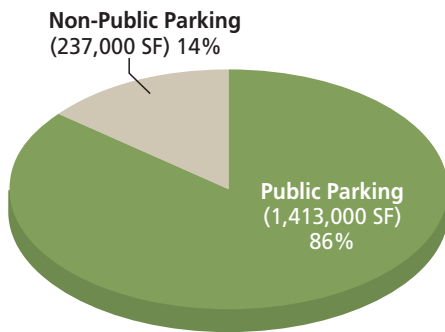


Based on the Cycle 5 asset conditions data, the majority (60%) of Class 1 & 2 roadway lane miles within the park have an average Pavement Conditions Rating (PCR) of Good. Nine percent of park lane miles are in poor condition.

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## PARKING ASSETS

TOTAL SQUARE FEET = 1,650,000



Roughly 2,315 parking spaces with a public classification and 390 non-public parking spaces. The requirement to provide on-site employee residences increases the amount of non-public parking.

## PARKING PAVEMENT CONDITION RATING (PCR)

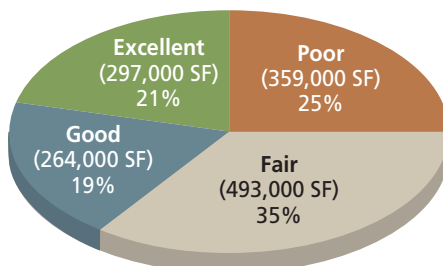
Parking Type	Average PCR*
Public Parking	75 - FAIR
Non-Public Parking	76 - FAIR
All Parking	75 - FAIR

\*Cycle 5 RIP data

Parking assets currently are rated slightly worse than roadway assets. Overall, the average PCR for all parking areas within the park is 75, Fair conditions.

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

TOTAL SQUARE FEET = 1,413,000



The majority of public parking areas are in fair or poor condition. Park-wide, public parking areas provide 485 parking spaces (297,000 square feet) in excellent condition, 435 spaces (264,000 square feet) in good condition, and 810 spaces (493,000 square feet) in fair condition. The remaining 585 spaces (359,000 square feet) are in poor condition.

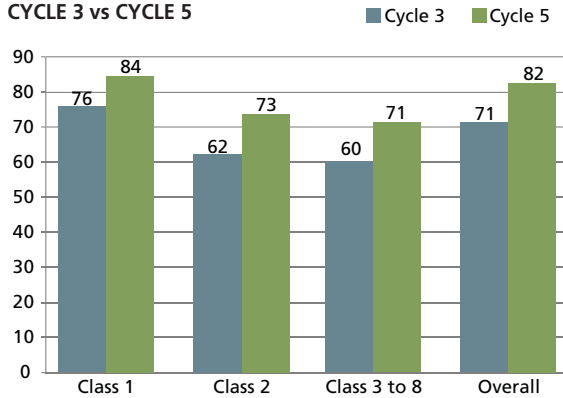
## ASSET CONDITIONS OVER TIME

The most recent cycle of RIP data available for Glacier roadways and parking is Cycle 5. A comparison of Cycle 3 and Cycle 5 asset data provides a snapshot of the roadway and parking conditions at Glacier National Park over time. The conditions are shown in the following tables. Between 2006 and 2012, the roadway pavement conditions within the park showed an improved condition. The parking conditions average PCR decreased slightly from 77 to 75. The average PCR was noted to improve for Class 1 & 2 roadways as well as Secondary parking areas.

### ROADWAY ASSETS

All roadway classifications experienced an improvement in average condition. Class 1 and the overall condition are approaching a Good average condition. The average condition for the Park roadways is Fair.

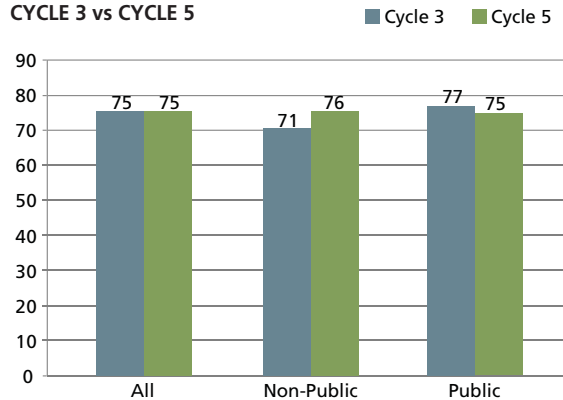
**ROADWAY CONDITIONS**  
CYCLE 3 vs CYCLE 5



### PARKING ASSETS

The average parking condition has remained steady between Cycle 3 and Cycle 5. The average PCR for non-public parking has increased while the public parking average has decreased slightly.

**PARKING CONDITIONS**  
CYCLE 3 vs CYCLE 5



## TRANSPORTATION TRAILS

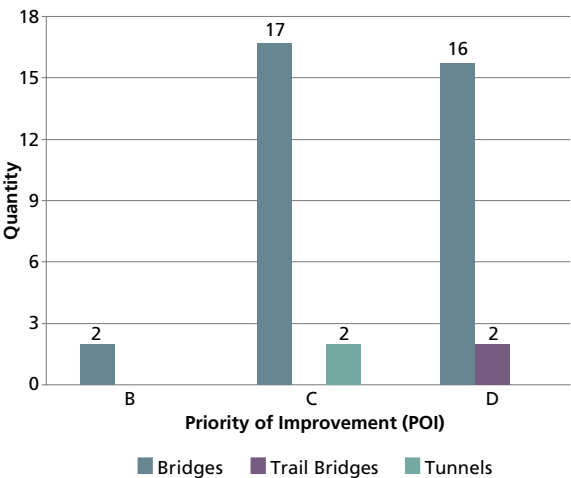
The park contains two transportation trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities." The multi-use Apgar Bike Trail connects the transit center to Apgar Village and Campground.

- Condition - Good
- Deferred Maintenance - \$63,221
- Current Replacement Value - \$1,676,28

BRIDGE AND TUNNEL ASSETS

Bridge and Tunnel Asset  
Quantity and Condition

TOTAL BRIDGE/TUNNEL ASSETS = 39



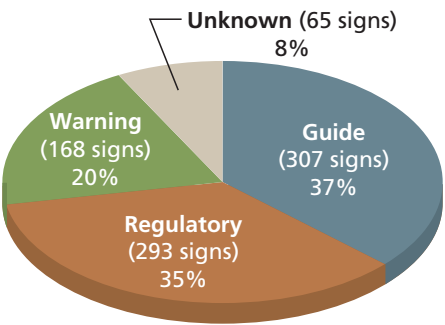
Glacier National Park contains 35 roadway bridges, two trail bridges, and two tunnel assets. Their priority of improvement is shown in the chart. Most assets have a POI of C or D, indicating they are structurally sufficient and not in need of immediate attention. Two bridges assets have a POI of B indicating near-term maintenance may be necessary.

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TRANSPORTATION SIGN ASSETS

Sign Asset Quantity and Condition

TOTAL SIGNS = 833



Glacier National Park roadways and parking areas contain 833 transportation signs. Approximately 37 percent of the signs are guide signs meant to direct visitors to the desired destinations. Fifty-five percent of the signs are regulatory and warning signs. The remaining 8 percent (65 signs) have unknown types since the signs are either missing or unreadable.

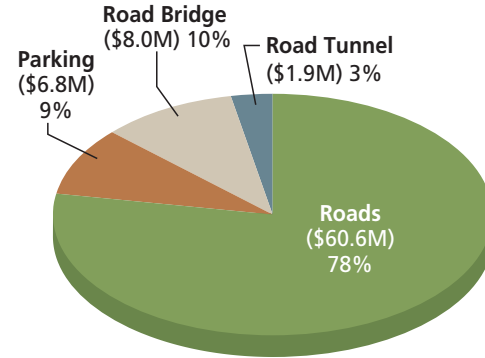
Condition	Quantity
Good	811
Fair	7
Poor	15

## DEFERRED ASSET MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Glacier National Park has accumulated approximately \$77.3 million in deferred maintenance.
- Three-quarters of the deferred maintenance is associated with Park roadways.
- Roadways and parking constitute approximately 87 percent of the Park's total deferred maintenance for transportation assets.
- Previous Cycle 3 data also included \$12.8 million of deferred maintenance for trails. Comparable trails data was not provided for Cycle 4/5.

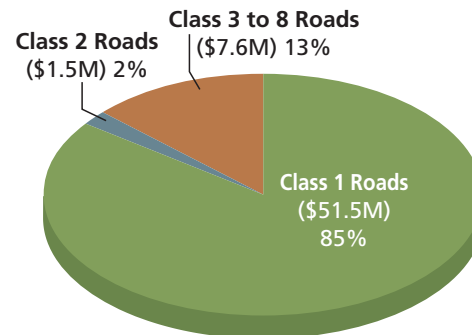
**TOTAL DEFERRED MAINTENANCE = \$77.3M**



## DEFERRED ROADWAY MAINTENANCE

- The majority of roadway deferred maintenance in Glacier National Park is associated with the Class 1 roadways.
- Approximately 85 percent (\$51.5 million) of roadway deferred maintenance is on Class 1 routes
- Currently Class 1 and 2 roadways are mostly in Fair condition. The majority of Class 1 lane miles (65%), on Going-to-the-Sun Road, are in fair to good condition.

**TOTAL DEFERRED MAINTENANCE = \$60.6M**



## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. In Glacier National Park, this system includes a large roadway and parking network as well as a shuttle system on Going-to-the-Sun Road. Not all facilities that serve to connect the region and the nation to the park are owned or operated by NPS. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Some pieces of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

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

Glacier National Park offers ATS services within the park, and the NPS provides major financial responsibility for the main point-to-point shuttle along Going-to-the-Sun Road. Interpretive motorized tours on the Going-to-the-Sun Road are available with park concessioners, Sun Tours and Glacier Park, Inc. The park's main shuttle system provides two-way service between the Apgar Transit Center and St. Mary Visitor Center. Shuttles run every 15 or 30 minutes dependent on location and time of day between approximately 7:00 a.m. and 7:00 p.m. They serve 16 shuttle stops. Approximately 10% of visitors use the shuttle service.

Glacier National Park ATS Summary

Annual Boardings <sup>1</sup>	171,000
Service Hours <sup>1</sup>	13,900
Service Miles <sup>2</sup>	335,000
Quantity and Type <sup>3</sup>	21 12-seat Dodge Daimler-Chrysler Sprinters 8 23-seat, 20-standee Optima buses
Fuel <sup>3</sup>	Biodiesel
Operating Season and Schedule <sup>3</sup>	July through Labor Day (September)
Operator <sup>3</sup>	Flathead Eagle County Transit under a cooperative agreement with the NPS
Options to using the ATS	Private vehicles

<sup>1</sup>Source: GLAC Phase II ATS PRO FORMA

<sup>2</sup>Source: 2007 Operating Statistics compiled in DEA Baseline Conditions Report

<sup>3</sup>GLAC ATS Phase II Technical Memorandum

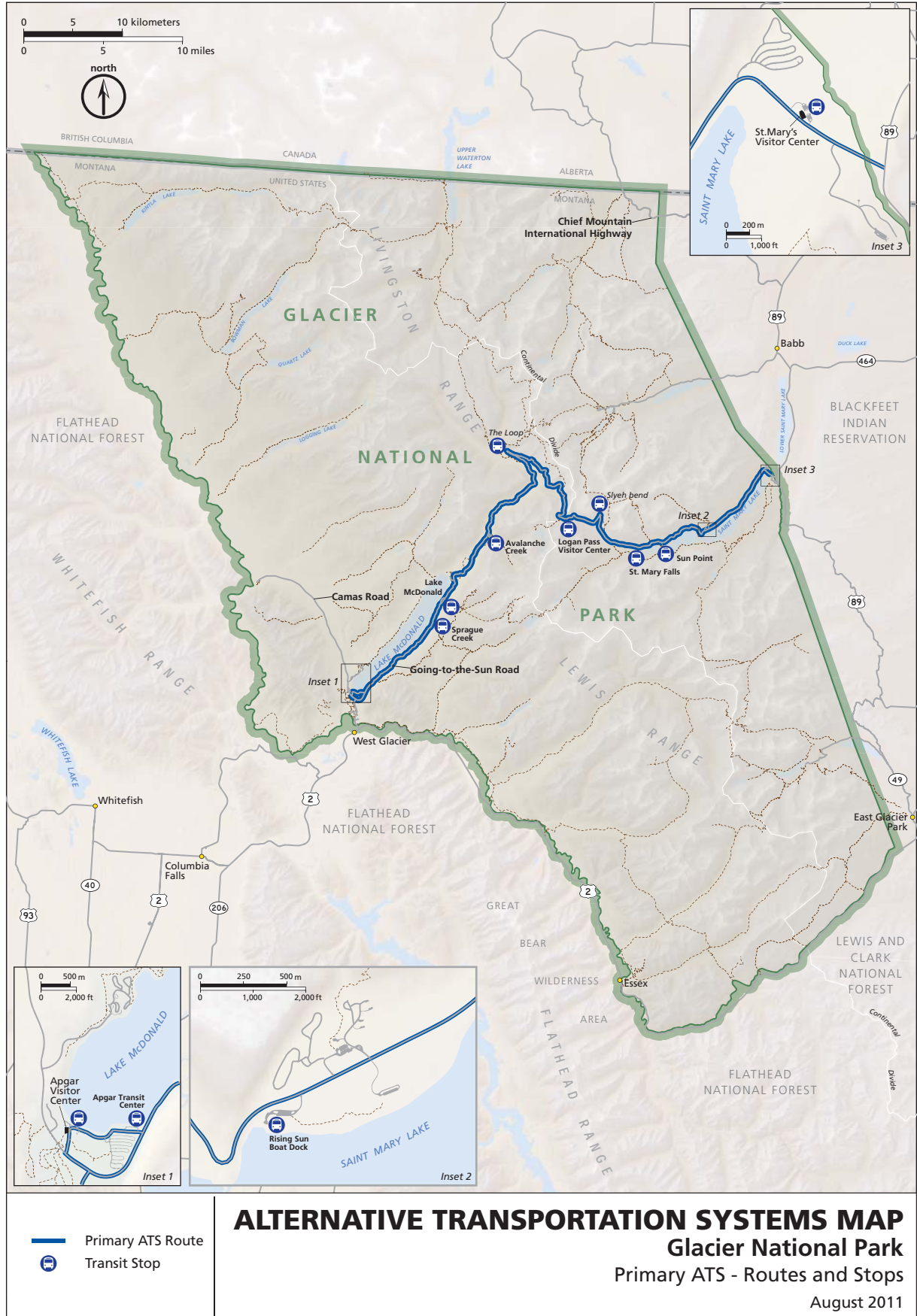
In 2010, the shuttle served 132,093 passengers. The shuttle operated a total of 335,000 service miles over 25,188 service hours. In addition, NPS provides two "Glacier Express" shuttles on the west side of the park, and one on the east side. These shuttles depart both the Apgar Transit Center and the Rising Sun Boat Dock and travel straight to Logan Pass without stopping at other locations on the Going-to-the-Sun Road. Given the vehicle size limits on Going-to-the-Sun Road, the Glacier National Park shuttle system utilizes smaller vans compared to the buses used in other IMR focus parks.

### ..... **AIRPORTS**

Several commercial service airports are located within driving distance outside of Glacier National Park. Glacier Park International Airport is located near Kalispell and is approximately 30 miles west of the West Entrance. The airport is served by four commercial airlines that provide direct service to several major cities including Salt Lake City, Denver, Seattle, Las Vegas, and Minneapolis. Shuttles to Glacier National Park are available at Glacier Park International Airport.

Great Falls International Airport is located between 130 miles and 165 miles east of East Glacier Park, St Mary, Two Medicines, and Many Glacier Entrances. The airport is served by four commercial airlines that provide direct service to many of the same cities served by Glacier Park International Airport.

INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT





## RAIL

Amtrak Empire Builder passenger rail services both East Glacier and West Glacier. A concessionaire provides a shuttle service at these locations. The Empire Builder route travels between Seattle/Portland and Chicago with service to Minneapolis.

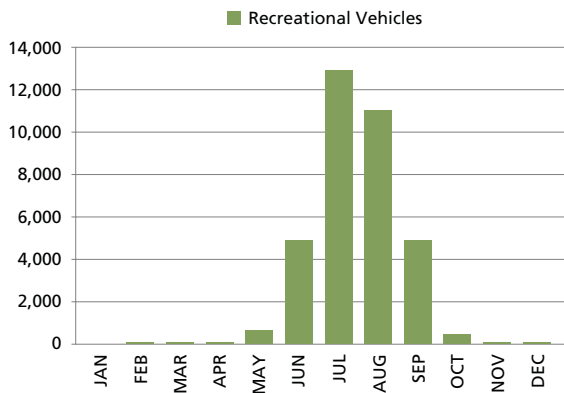
## MULTI-MODAL CONNECTIVITY

The transit system at Glacier National Park is accommodating to both bicyclists and hikers. However, the popularity of the transit system can be frustrating. Visitors who hike to Logan Pass arrive at the top hot, tired, and wanting to return to their vehicle at the bottom quickly, yet may face long wait times as demand is high and shuttles are typically full, especially in the late afternoon.

The buses procured in 2009 are equipped with bicycle racks for recreational cyclists who want to ride down GTSR. Bikes are restricted on eastbound Going-to-the-Sun Road from 11 am to 4 pm because the road is narrow and has a steep 6% grade.

## CONGESTION

### RV Vehicles

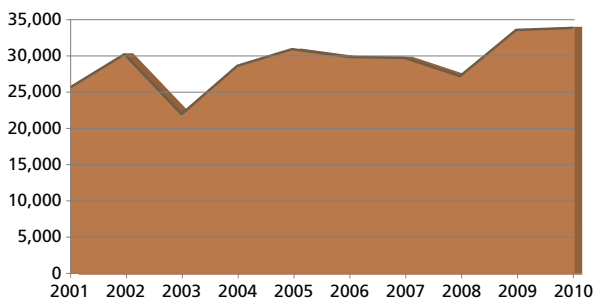


The number of vehicles entering Glacier National Park increased steadily (2.8% annually) from 2001 to 2010. The peak visitation month in 2010 was July. Glacier National Park welcomes approximately 8,090 vehicles on a peak visitation day.

During peak season, over 12,000 RVs visit Glacier National Park in a month. Glacier National Park does not log the number of commercial tour buses that visit the park.

The number of RVs entering the park on an annual basis has been stable but increasing in recent years.

### Annual RV Overnights



## CONGESTION LOCATIONS

As part of the 2010 Service-wide Congestion Management System (CMS) survey, Glacier National Park identified several congested locations within the park including park entrance stations, pedestrian/people loading areas, and visitor centers. The entrances at each end of Going-to-the-Sun Road were specifically identified, as well as Logan Pass Visitor Center and Apgar Village.

Congested Areas	Locations Identified
Park Entrance Stations	Going-to-the-Sun Road (both east and west)
Ped/People Loading Areas	Road through Apgar Village Avalanche The Loop Logan Pass Visitor Center Swiftcurrent Motor Inn
Visitor Centers	Logan Pass Visitor Center Apgar Village

## CONGESTION MITIGATION STRATEGIES

Glacier National Park staff indicated the use of three congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey. The park uses ATS services, changes in traffic circulation, and remote parking with shuttle service to help reduce vehicular congestion within the park. Mitigation results have been identified as partially successful with the expectation that the measures would fully alleviate congestion.

## ITS STRATEGIES

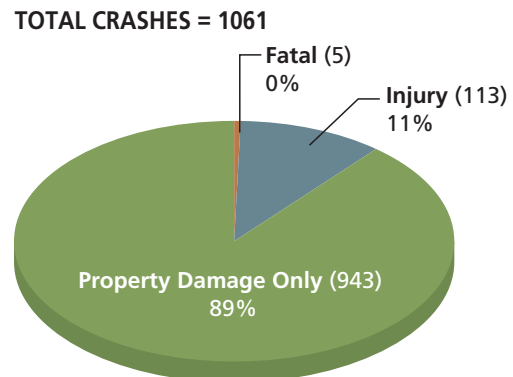
Park staff identified highway advisory radio (HAR) as an ITS congestion mitigation strategy currently used within the park in the 2010 Service-wide CMS survey. Park staff indicate that this strategy does not provide real-time congestion information and is not an effective tool for combating congestion.

Congestion Mitigation Strategy	Mitigation Result
Highway Advisory Radio (HAR)	Is static – not helpful in providing congestion information

The park website lists webcams, their RSS News feed, blogs, and podcasts as providing information, in addition to Facebook, Twitter, YouTube videos, and a Flickr photo site. All of these locations can provide different levels of information about conditions within Glacier National Park.

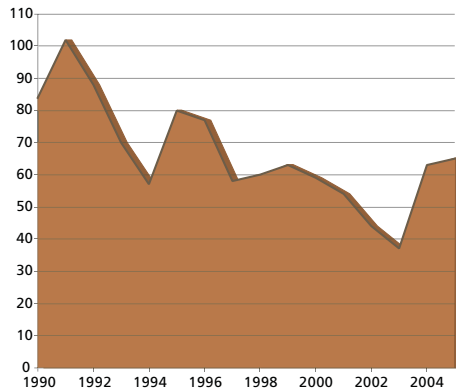
## CRASH SEVERITY

Glacier National Park experienced 1,061 crashes between 1990 and 2005, which averages to 66 per year. Five of these crashes included a fatality and 113 (11%) included at least one injury. The majority (89%) were property damage only (PDO).



## ANNUAL CRASHES

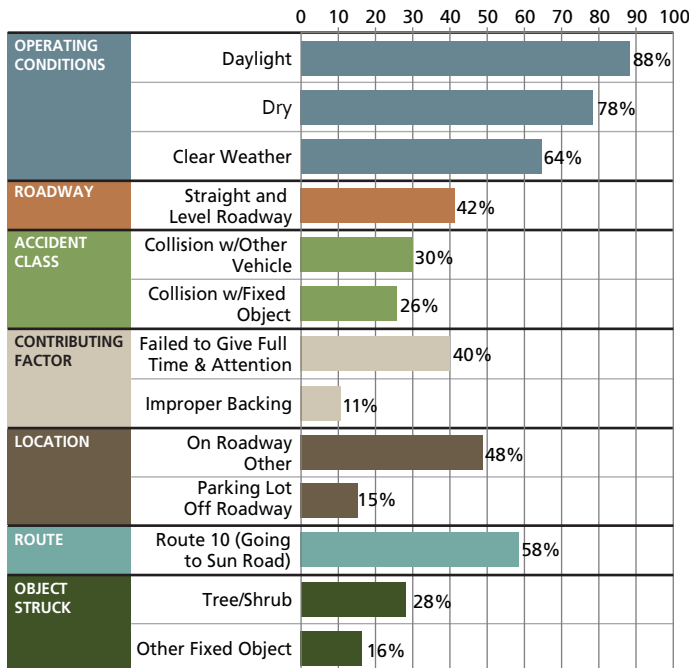
### ANNUAL CRASHES



Glacier National Park averaged approximately 66 crashes per year from 1990-2005. The park has experienced a decrease in crashes over that time, but has had a slight jump in annual crashes in recent years. The current trend from 1990 to 2005 indicates the number of crashes decreased by approximately 4.7 percent per year.

GLAC

## CRASH CONDITIONS (1990-2005)



The characteristics of the crashes are illustrated in the following chart. The majority of crashes occur on clear, dry days during daylight hours. However, a greater proportion of crashes occur during wet overcast weather, likely experienced on Going-to-the-Sun Road. One-quarter of the crashes are collisions with fixed objects, and 30 percent involve another vehicle. Frequently, the contributing factors involve failure to give full time and attention. Most crashes occur on Going-to-the-Sun Road.

## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information that the National Park Service collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Glacier National Park. With over 2.2 million visitors annually, the National Park Service is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park. Glacier National Park's website, including webcams, brochures, and multimedia presentations, as well as Twitter and Facebook sites make it easier to plan a trip and spend time in meaningful ways, whether spending a single day or multiple days within the park.

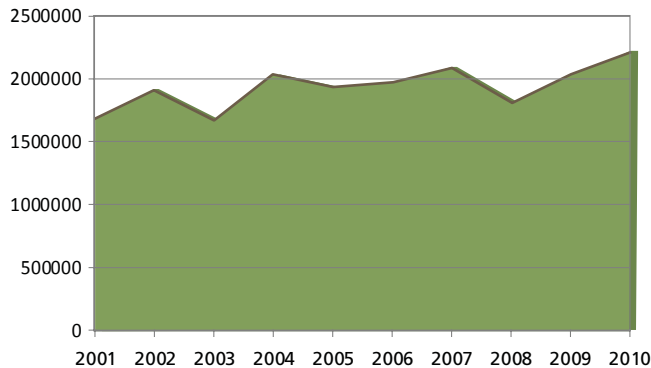
### VISITATION .....

Glacier National Park had approximately 2,200,000 recreational visitors in 2010. Between 2001 and 2010, recreational visitation increased by about 2.8 percent per year.



## ANNUAL VISITATION

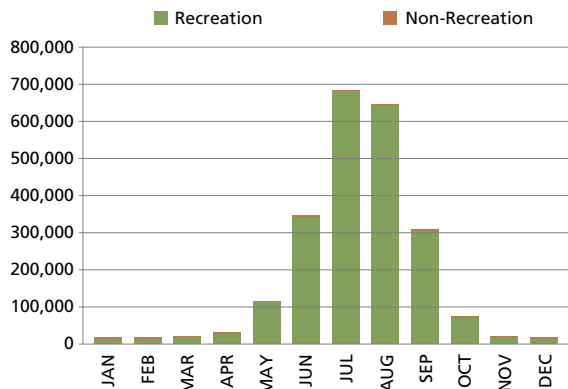
Recreation Visitation 2001-2010



Non-recreational visitation, which includes employees and facility support vehicles, is 1 percent of total visitation. The non-recreational visitation has also increased between 2000 and 2010, by approximately 9.9 percent per year. In 2010, non-recreational visitation was approximately 18,500.

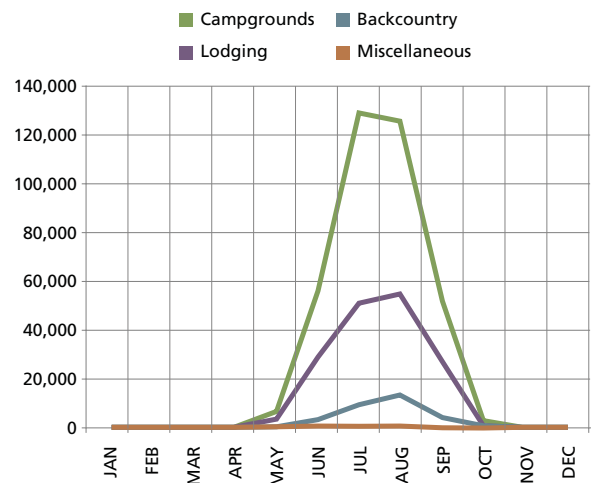
GLAC

Visitors By Month



The peak months of visitation are July and August, the two months when Going-to-the-Sun road is typically cleared of snow.

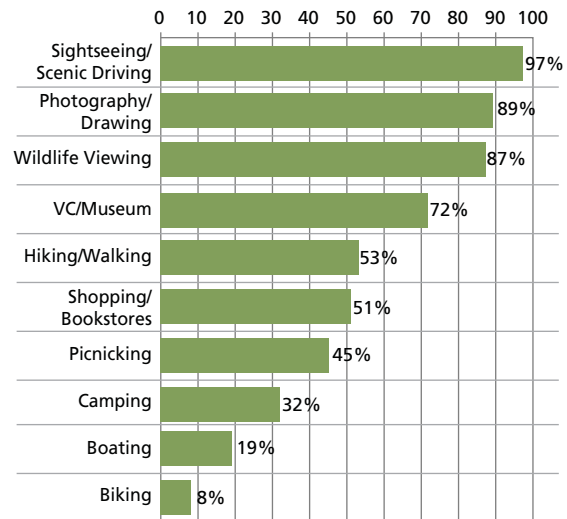
Overnight Stays By Month



Over 120,000 overnight stays per month occur during those same months. Most of the overnight stays are in lodges or campgrounds.

## VISITOR ACTIVITIES

The primary activities of visitors to Glacier National Park include scenic drives, photography, wildlife viewing, visitor centers and museums and hiking. Shopping, picnicking, camping, boating and biking are secondary activities. Winter activities include cross-country skiing, sledding, and snowshoeing. Photography experiences cannot be beat at this park. Glacier National Park research programs also attract participation.



## VISITOR SERVICES USED

Glacier National Park visitors were not surveyed on the services used in the park. Glacier National Park visitors who do not choose to drive their own vehicles may ride the park's shuttle bus to enjoy the scenic vistas or boat, hike and bike. The shuttle serves 16 stops along Going-to-the-Sun Road 12 hours a day and visitors can be picked up at any stop every 15-30 minutes. Food is available at lodges and visitor centers. Visitors may stay overnight in historic grand hotels dating back to the early 1900s, modern motel type accommodations, rustic cabins, or historic backcountry chalets. Ranger-led tours can also be part of the day's excursion.

Additionally, Glacier National Park brings the park experience to visitors with modern communication tools via their website and the internet. These include virtual e-tours and e-hikes, panoramic photos, webcams, news releases through their RSS News feed, blogs, and podcasts. Last but not least is social media, including Facebook, Twitter, YouTube videos, and a Flickr photo site.

## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP completed in 1990 and not consulted for this report.
- 2010 CMS Survey
  - Congested locations: park entrance stations, ped/people loading areas, visitor centers
  - Strategies: ATS, remote parking with shuttles, changes in traffic circulation, use of MDOT VMS, eBlasts, GPS bus tracking,
- Surveys & Interviews, 2011
  - Congested locations: Going-to-the-Sun Road, transit system, timing of getting everyone down Logan Pass in the late afternoon, visitor center, trails, construction areas, parking lots
  - Strategies: Going-to-the-Sun rehabilitation, working to increase parking



## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in Glacier National Park.

### AIR QUALITY AND GHG EMISSIONS

The park is located in the Flathead County, Montana non-attainment area that is monitored for the air pollutant Particulate Matter 10 (PM-10).

Mobile GHG Emissions	
Park Operations (MTCO <sub>2</sub> E)	1,288.9
Visitors (MTCO <sub>2</sub> E)	11,009.0
Concessionaires (MTCO <sub>2</sub> E)	30.7
Total Mobile GHG Emissions	11,039.7

*Climate Leadership In Parks*

The park had completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

### SIGNIFICANT RESOURCES

Glacier National Park is significant in many ways:

- Scenery dramatically illustrates an exceptionally long geologic history and the many geological processes associated with mountain building and glaciation.
- Offers relatively accessible spectacular scenery and increasingly rare primitive wilderness experiences.
- Is at the core of the “Crown of the Continent” ecosystem, one of the most ecologically intact areas remaining in the temperate regions of the world.
- Waterton-Glacier is the world’s first international peace park.

### THREATENED AND ENDANGERED WILDLIFE AND PLANT SPECIES

Common Name	Species Name	Listing Category	Status in Park
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Delisted Monitored	Current
Brown Bear	<i>Ursus arctos</i>	Threatened	Current
Bull Trout	<i>Salvelinus confluentus</i>	Threatened	Current
Canada Lynx	<i>Lynx canadensis</i>	Threatened	Unconfirmed
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Delisted Monitored	Current
Gray Wolf	<i>Canis lupus</i>	Delisted Monitored	Current
Woodland Caribou	<i>Rangifer tarandus caribou</i>	Endangered	Historic

There are no plant species currently listed as threatened or endangered, nor are there candidates for threatened or endangered status.

### HISTORIC TRANSPORTATION ASSETS

The Going-to-the-Sun Road is a National Historic Landmark originally completed in 1932. It crosses the park via Logan Pass and provides access to alpine landscapes and scenic views. Reconstruction of the road began in the 1980s and is expected to be complete by about 2015. Approximately 35% of the park’s roadways are listed as historic assets.

## SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Glacier National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

### REGIONAL AND COMMUNITY STAKEHOLDERS

Glacier National Park is located in northern Montana on the Canadian border, enabling the creation of the Waterton-Glacier International Peace Park. As a result, the park is in a unique position to coordinate with communities in two countries. The area surrounding the park is very rural in nature, with only a few small communities providing services outside of the park. The park is bordered by the Blackfeet Indian Reservation to the east, the Flathead National Forest to the west, and Lewis and Clark National Forest to the south. The Canadian provinces of British Columbia and Alberta border the park to the north. Several US federal highways, overseen by FHWA and Montana DOT, provide access to the park within Montana. Alberta provincial highways provide access within Canada.

Regional Communities	<ul style="list-style-type: none"> <li>• Whitefish, MT</li> <li>• Kalispell, MT</li> </ul>	<ul style="list-style-type: none"> <li>• Browning, MT</li> <li>• Waterton, Alberta, Canada</li> </ul>
US Forest Service	<ul style="list-style-type: none"> <li>• Flathead National Forest</li> </ul>	<ul style="list-style-type: none"> <li>• Lewis and Clark National Forest</li> </ul>
US Bureau of Reclamation	<ul style="list-style-type: none"> <li>• Hungry Horse Reservoir</li> </ul>	
Indian Nations	<ul style="list-style-type: none"> <li>• Blackfeet</li> </ul>	
Province of Alberta Ministry of Transportation	<ul style="list-style-type: none"> <li>• Highway 2</li> <li>• Highway 5</li> </ul>	<ul style="list-style-type: none"> <li>• Highway 6</li> </ul>
Province of British Columbia Ministry of Forests	<ul style="list-style-type: none"> <li>• Flathead Provincial Forest</li> </ul>	
US DOT (FHWA) and MDT	<ul style="list-style-type: none"> <li>• US 2</li> <li>• US 89</li> <li>• US 93</li> <li>• SH 17</li> </ul>	<ul style="list-style-type: none"> <li>• SH 40</li> <li>• SH 49</li> <li>• SH 206</li> <li>• SH 464</li> </ul>

..... **TRANSPORTATION RELATED PARTNERSHIPS**

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.



**Existing Partnerships**

Community Partnerships	<ul style="list-style-type: none"> <li>• Cooperative agreement with the Flathead Valley FTA, Eagle Transit, to run transit system including informal relationship with County Transportation Board.</li> <li>• Relationship with MT DOT based on transit system.</li> </ul>
Glacier National Park Associates	The Associates donate money, goods, and voluntary services to Glacier National Park and serves as an official park partner specializing in volunteer services. Glacier National Park Associates fundraises for and donates funds to the park in support of a backcountry ranger intern, backcountry preservation projects, stipends for high school interns who work in the park's native plant nursery, and other projects identified by the park related to trails, historic buildings, and research projects.
Glacier National Park Conservancy	The Glacier National Park Fund and the Glacier Association merged and became known as the Glacier National Park Conservancy as of January 1, 2013. The goal is to be one voice seeking to generate financial support for the park through private fundraising, philanthropic activities, and operation of the bookstores within the park and at other federal agency partner sites in Montana.
The Glacier Institute	The Institute provides field-based in depth learning experiences to the public and serves as an official park partner specializing in field seminars. Glacier Institute fundraises for youth programs which take place at Big Creek Outdoor Education Center located in Flathead National Forest. Glacier Institute does not conduct fundraising for National Park Service projects, but will occasionally solicit funds for building maintenance and enhancements of the Field Camp site within the park. Glacier Institute's income sources include tuition, donations, memberships, and grants.

## CLIMATE CHANGE CLIMATE FRIENDLY PARK.....

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Glacier National Park is certified as a CFP and has incorporated their Climate Friendly Park Action Plan into their Environmental Management Plan.

### Transportation Related Strategies

Program	Visitor Transportation
Goal 1	Create multi-modal shuttle system as an alternative for visitor transportation
Goal 2	Partner with surrounding communities to extend and connect park alternative transportation options beyond park boundaries
Program	Employee Transportation
Goal 1	Initiate staff transportation alternatives for on-the-job travel
Goal 2	Reduce number of single-passenger cars driven by employees to and from work through alternative transportation initiatives for commuting
Program	Vehicle Use/Fleet Maintenance
Goal 1	Manage fleet efficiency
(Glacier National Park Environmental Management Plan, March 2006)	

## PARK INTERVIEWS AND PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS . . . .

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

### VISITOR EXPERIENCE

- Capacity and Congestion
  - Large volume of visitors expect to use the transit system.
  - Limited bus capacity – partly due to size restriction on Going-to-the-Sun Road.
  - Construction creates bottle necks in headways.
  - Comments received by visitors tend toward capacity issues.
  - Concentrated congestion and resource impacts at specific transit stops that need to be moved.
  - Concentrated uses at specific times, such as early morning taking hikers to trailheads, with a late afternoon return.
  - Many Glacier Valley and other places are congested and dangerous during peak season. Outside of the peak season the park is effective at conveying visitors and meeting expectations. Parking is identified as the main issue.
- Parking
  - Logan Pass parking is full from 10 am to 1 pm most days.
  - St. Marys has expanded parking and still fills up.
- Helpful Transportation Investments
  - Full rehabilitation of the GTSR completed by 2015 to 2016.
  - 6% vehicle reduction on GTSR because of transit.

### VISITOR EXPERIENCE, continued

- Bicycling and Pedestrians
  - Paved bicycle path on the west and the east side linking pre-transit functions; not focused toward getting people to transit facilities.
  - Paved pedestrian and bicycle paths connect west side transit center Apgar Village and Campground.
  - Bicycle racks on new 2009 Sprinters used for recreational cyclists who want to ride down the Going-to-the-Sun Road.
  - Bicycles allowed on the west side of the GTSR anytime heading west but limited east bound due 6% grade and narrow road.
- Communications and ITS
  - Minimally functional GPS based ITS system (expensive to install and maintain).
  - Not a sustainable system due to proprietary software and expense.
  - Award winning webpage, Twitter, Facebook, eBlasts to a large list of subscribers, press releases.
  - Montana DOT variable message signs to communicate status of the GTSR.
  - No extension of ITS to gateway communities other than the Montana DOT.
  - Each bus is radio equipped and used to communicate the condition of the road, congestion, and numbers of people waiting for a bus.
  - Automated announcements to bus passengers.
  - Digital coordination of location and schedule.
- ATS
  - Approximately 3,000 visitors per day at Logan Pass has created unforeseen congestion around the Visitor Center and local trails.
  - Working with the University of Montana to utilize the VERP planning methodology to develop a Corridor Management Plan, including corridor carrying capacity .
  - The average wait to use the transit system is 45 to 60 minutes. Although the transit is effectively conveying visitors, visitor expectations are not being met and because of this it is considered a failing system. Many negative comments are received about the system.
  - Eagle Transit is not sustainable because of its maintenance burden. Twenty-five percent of the buses are owned by the Park.
- Parking
  - Working with FHWA to increase the parking at the west side transit center and move visitor center function to that location.
  - Parking congestion at Apgar Village is a very negative experience.

### RESOURCE PROTECTION

- Transit Impacts on Logan Pass
  - Large volume of people arriving at Logan Pass is beginning to take a toll on congestion and resources impacts.
  - None that have surfaced. The system is in its 5th year of operation.
- Key Resources at Risk
  - Going-to-the-Sun Road is a National Historic Landmark.
  - Intact ecosystem called the Crown of the Continent.
  - Many Glacier Hotel.
  - Glacier carved landscape.
  - Largest population of grizzly bear in lower 48.
  - Noise from the road and buses affects the visitor experience.

### SUSTAINABLE OPERATIONS

- Reducing Carbon Emissions
  - Availability of alternative fuel or hybrid transit buses to meet altitude and mountainous conditions needs does not currently exist.

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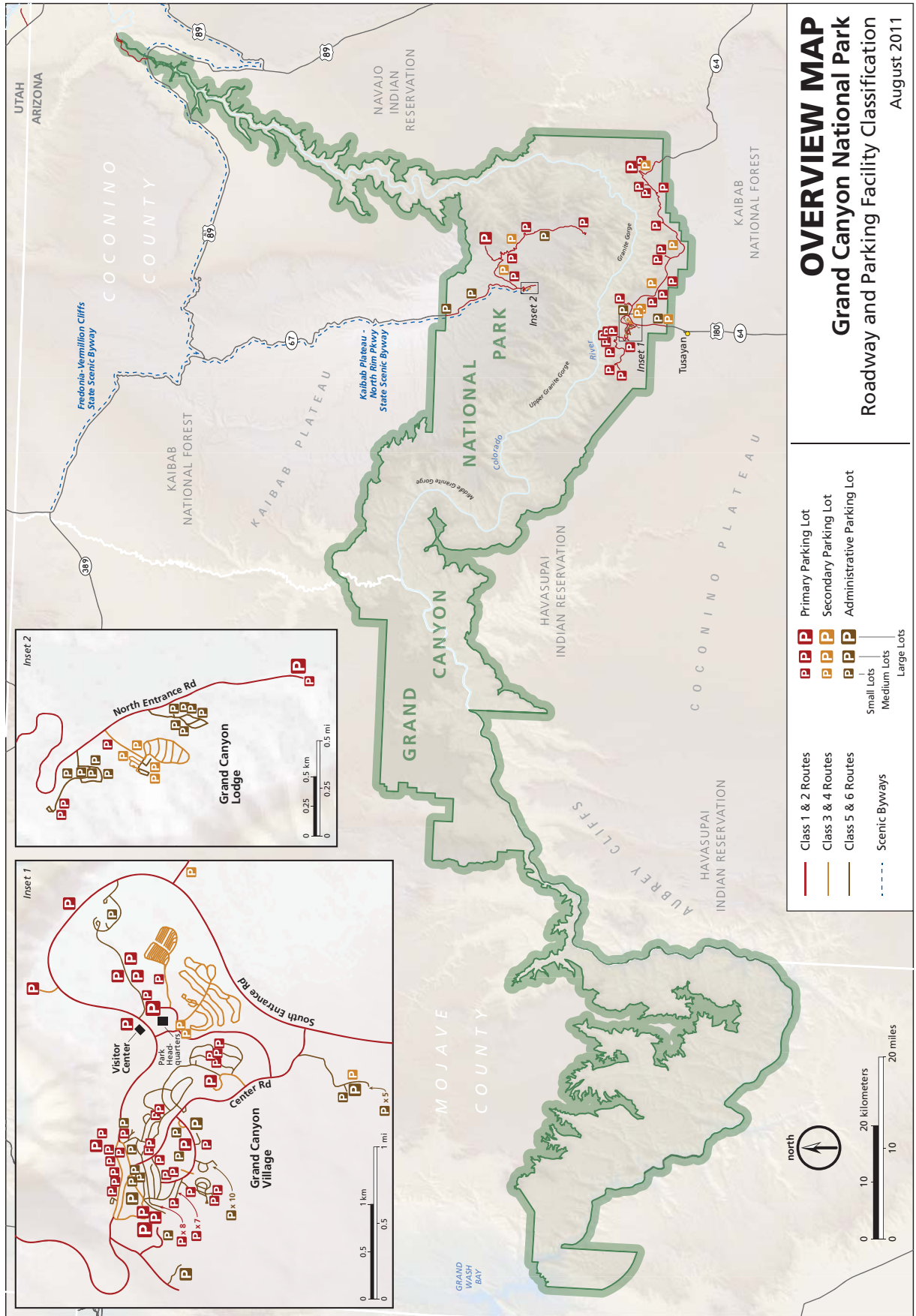
# Grand Canyon National Park

(GRCA)



GRCA





# GRAND CANYON NATIONAL PARK (GRCA)

## AT A GLANCE

**STATE:** Arizona    **SIZE:** 1,902 square miles    **TYPE:** Rural

ROADWAY/PARKING CONDITION (CYCLE 4)					Asset Management
	PCR	DM	Lane Miles	Area/Spaces	
Roadways	82 / FAIR	\$68.3 Million	204	–	
Parking	84 / FAIR	\$11.0 Million	–	3,170,000 SF / 5,195	
Replacement Value of All Transportation Assets			\$470.5 Million		
<b>CONGESTED AREAS</b>					Mobility, Access, & Connectivity
<ul style="list-style-type: none"><li>• Parking Areas</li><li>• Transit Stops</li><li>• Trailheads</li><li>• Shuttle capacity</li><li>• South Rim Village</li></ul>					
<b>ALTERNATIVE TRANSPORTATION SYSTEM</b>					
Annual Boardings		4,775,000			
Fuel Type		CNG			
<b>FEES</b>					
Transportation Fee		\$13			
FLREA (% retention)		80%			
<b>VISITATION (2010)</b>					Visitor Experience
Total Visitors	4,470,000				
Non-Recreation Visitors	82,000				
Recreation Visitors	4,470,000				
10-Year Trend	+0.7%				
<b>VISITOR EXPERIENCE QUALITY SCORE</b>					
Roads	Parking	Date			
84	65	2003			
(University of Idaho Survey)					
<b>TOP ACTIVITIES</b>					
<ul style="list-style-type: none"><li>• Sightseeing/scenic drive</li><li>• Self-guided rim walk</li><li>• Shopping</li></ul>					
<b>AT-RISK RESOURCES</b>					Resource Protection
<ul style="list-style-type: none"><li>• Scenic views</li><li>• Air quality</li><li>• Soundscape</li><li>• Cultural resources</li><li>• Wildlife</li></ul>					
Air Quality Status	Monitored*				
*see page 67					
<b>TRANSPORTATION/RESOURCE ISSUES</b>					
<ul style="list-style-type: none"><li>• Unauthorized parking</li><li>• Wildlife/vehicle crashes</li><li>• Social Trails</li><li>• Inadequate shuttle support facilities (fueling, washing, maintenance)</li></ul>					
<b>MAJOR HISTORIC TRANSPORTATION ASSET</b>					
<ul style="list-style-type: none"><li>• Grand Canyon Village</li></ul>					
<b>KEY PARTNERS</b>					Sustainable Operations
<ul style="list-style-type: none"><li>• Grand Canyon Association</li><li>• Grand Canyon Field Institute</li><li>• ADOT/Coconino Dist</li></ul>					
Climate Friendly Park Status		Certified			
Green House Gas Emissions		55,471 Metric Tons			
(Grand Canyon National Park Action Plan)					

GRCA

### Key Transportation Findings and Challenges

<b>Asset Management</b>	74% of Class 1 & 2 roadway lane miles are in Good or Excellent condition. The average PCR of all roads improved from 56 (Cycle 3) to 82 (Cycle 4).
	58% of public parking area in Good or Excellent Condition, showing improved PCR from 59 (Cycle 3) to 85 (Cycle 4).
	\$79.3 M in deferred maintenance of transportation assets, about 9% of total IMR DM, the third largest single source of DM
<b>Mobility, Access, &amp; Connectivity</b>	The most visited park in the IMR has improved multi-modal connectivity with the expansion of the multi-use trails/greenway system, a large transit system, and ITS applications.
	Significant success in managing congestion through ATS, pedestrian and bike facilities, expanded parking supply, remote parking/shuttle.
	Over 6,000 large vehicles (tour buses and RVs) visit monthly during peak season.
	Parking areas still experience congestion. Visitors could benefit from real-time information that indicates which lots have availability.
	Average 179 vehicle crashes annually since 1990, but declining—most occur on the main roads.
<b>Visitor Experience</b>	2010 Recreation Visitation 4,388,386 (Large) - Highest in IMR.
	Recreational visitation grew 0.7% annually 2001-2010.
	Significant congestion on the South Rim at the Visitor Center, Canyon Village, Yaki Point, Market Plaza, Kaibab Trailhead and transit stops on the Village Route is a challenge for all aspects of park management, including vehicle noise and air quality.
	Annual ATS riders 4.8 million, estimated at 115% capacity.
	While 95% of visitors report dependence on the park's directional signs, the full implementation of ITS solutions/information about real time parking congestion remains unfunded.
<b>Resource Protection</b>	Parking facilities are congested, causing visitors to park in undesignated areas. Unauthorized parking contributes to social trailing, compaction of soils, and damage to vegetation.
	The large number of private, shuttle, and tour vehicles impact air quality and the soundscape. New agreement limits air tours and noise intrusions in sensitive areas.
	Vehicle/animal conflicts are a significant problem, notably vehicle crashes with wildlife (deer, elk, and mountain lions) along the park's East Rim Drive between the South Rim Village area and Desert View.
	2% of roadway lane miles and 6% of parking areas are designated as historic, including the Grand Canyon Village network of roads.
	Private vehicle crowding in historic South Rim Village area affects historic landscape and visitor experience).
	Resource damage is caused by the lack of adequate support facilities for the park's shuttle bus system (i.e., adequate and updated fueling system, bus wash areas, holding, and maintenance facilities).
<b>Sustainable Operations</b>	Climate Friendly Park Certified.
	Threats include changing weather patterns, vegetative cover, wildlife patterns, and water availability.
	Park fleet is now 100% natural gas fueled.

## MISSION

Grand Canyon National Park was established to preserve and protect the unique geologic, paleontologic, and other natural and cultural features for the benefit and enjoyment of the visiting public; provide the public opportunity to experience outstanding natural and cultural features, including natural quiet and exceptional scenic vistas; and protect and interpret Grand Canyon's extraordinary scientific and natural values.

## PARK DESCRIPTION

Grand Canyon National Park is 1,902 square miles in size and was established in 1919. The park was established to preserve one of the few natural landmarks visible from space, a massive rift carved by the Colorado River that stretches 277 miles. In places the canyon is 15 miles wide and up to 1 mile deep. Some visible rock formations are over 2 billion years old.

A World Heritage Site, Grand Canyon National Park consists of raised plateaus and structural basins typical of the southwestern United States. The Grand Canyon is one of the most studied geologic landscapes in the world. It offers an excellent record of three of the four eras of geologic time, a rich and diverse fossil record, a vast array of geologic features and rock types, and numerous caves containing extensive and significant geological, paleontological, archeological and biological resources.

The park contains several major ecosystems. Its biological diversity can be attributed to the presence of five of the seven life zones and three of the four desert types in North America. The park also serves as an ecological refuge, with relatively undisturbed remnants of dwindling ecosystems. It is home to a number of rare, endemic, and specially protected plant and animal species.

The oldest human artifacts found in the Grand Canyon are nearly 12,000 years old and date to the Paleo-Indian period. There has been continuous use and occupation of the park since that time. The Grand Canyon is one of 45 NPS units that participates in the Vanishing Treasure Program, which has the goal of conservation of architectural remains through research, documentation, and preservation treatment.

## PARK LOCATION

Grand Canyon National Park is located in northern Arizona. It has two sections, the North Rim and South Rim. The only direct access between the two rims is a hiking trail through the canyon. There is one entrance to the North Rim that is 30 miles from Jacob Lake, AZ, and approximately 270 miles from Las Vegas, NV. There are two entrances to the South Rim of the Grand Canyon. The South Rim is 80 miles from Flagstaff, AZ; 225 miles from Phoenix, AZ; and 275 miles from Las Vegas, NV.

Nearby National Park Service units include:

- from the South Rim: Sunset Crater Volcano NM (95 miles) and Lake Mead NRA (130 miles)
- from the North Rim: Pipe Spring NM (90 miles), Glen Canyon NRA (125 miles), Zion NP (155 miles), and Bryce Canyon NP (160 miles)

## TRANSPORTATION OVERVIEW

Grand Canyon National Park provides 204 lane miles of roadway and 3,170,000 square feet (5,195 spaces) of parking infrastructure. Non-motorized transportation routes connect cyclists and hikers to scenic areas on both the north and south rims. An ATS shuttle system provides four separate routes of service on the South Rim of the canyon. Grand Canyon Airport lies 10 miles south of the south entrance.

The Park has three primary entrances. The only entrance to the North Rim, North Rim Entrance Road, is on State Highway 67 with access from Jacob Lake, AZ. The route provides direct access to the North Rim village which includes the visitor center and the Grand Canyon Lodge. There are two primary entrances to the South Rim. Desert View Drive is on State Highway 64 and provides access to the South Rim Village as well as vistas along the South Rim of the canyon. Desert View Drive is also served by two of the four shuttle routes provided on the South Rim. The Tusayan Route Shuttle provides free shuttle bus service between the park and the town of Tusayan, AZ, from mid-May to mid-September.

## ASSET MANAGEMENT

The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Grand Canyon National Park transportation assets is \$470.5 million.

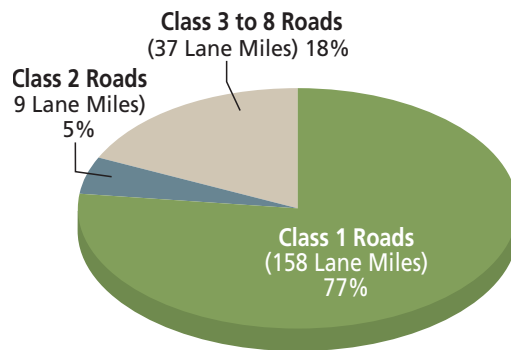
### Grand Canyon National Park Roadway and Parking Assets

- Approximately 204 lane miles of roadway network on 134 different routes.
- Approximately 3,170,000 square feet (5,195 spaces) of parking area provided in 184 identified parking areas.
- 167 lane miles are defined as Class 1 or 2 roads (82%).

### ROADWAY ASSETS

Class 1 & 2 roads account for 82 percent of roadways in Grand Canyon National Park. Eleven percent of roadways are Class 5 & 6, many of which are roadways within the residential area of the South Rim Village. Approximately 21 lane miles of roadway within the South Rim Village are not open to the public.

TOTAL LANE MILES = 204



### ROADWAY PAVEMENT CONDITION RATING (PCR)

The roadway classifications have an average condition of fair in Grand Canyon National Park. A majority of all lane miles within the park received a PCR rating of good or excellent. Class 3 to 8 roadways have an average condition of poor.

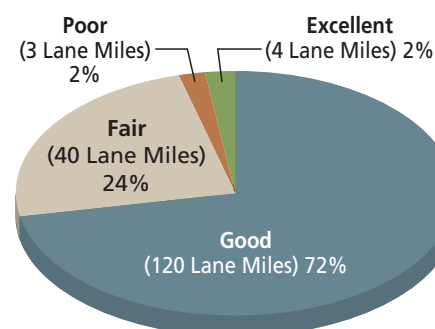
Roadway Type	Average PCR*
All Roadways	82 - FAIR
Class 1	92 - GOOD
Class 2	84 - FAIR
Class 3 to 8	57 - POOR

\*Cycle 4 RIP data

### CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

Ninety-six percent of roadway pavement classified as Principal Park Road (Class 1) or Connector Park Road (Class 2) within the park is rated as fair (24%) or good (72%). Two percent of Class 1 & 2 lanes miles received a PCR of poor.

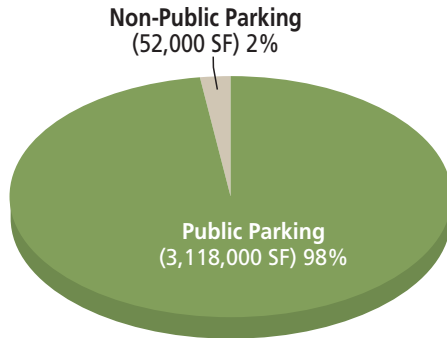
TOTAL LANE MILES = 167





## PARKING ASSETS

TOTAL SQUARE FEET = 3,170,000



Approximately 98 percent of the parking facilities are classified as public. Park-wide there are approximately 5,110 public parking spaces and 85 non-public parking spaces.

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## PARKING PAVEMENT CONDITION RATING (PCR)

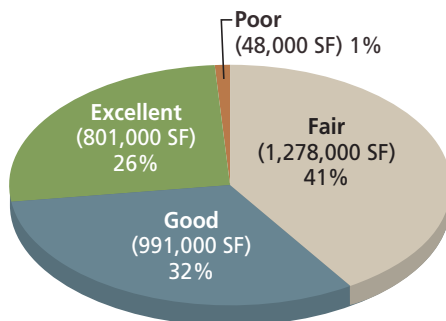
Parking Type	Average PCR*
Public Parking	85 - GOOD
Non-Public Parking	75 - FAIR
All Parking	84 - FAIR

\*Cycle 4 RIP data

Parking assets are currently rated slightly better than roadway assets. The average PCR for public parking assets is good compared to a fair average condition for roadways.

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

TOTAL SQUARE FEET = 3,118,000



The majority of public parking areas is in good or excellent condition. One quarter of total parking areas is in excellent condition. The average PCR for these assets is good. Park-wide, public parking areas contain approximately 1,310 spaces (801,000 square feet) in excellent condition, 1,625 spaces (991,000 square feet) in good condition, and 2,095 spaces (1,278,000 square feet) in fair condition. The remaining 165 spaces (48,000 square feet) are in poor condition.

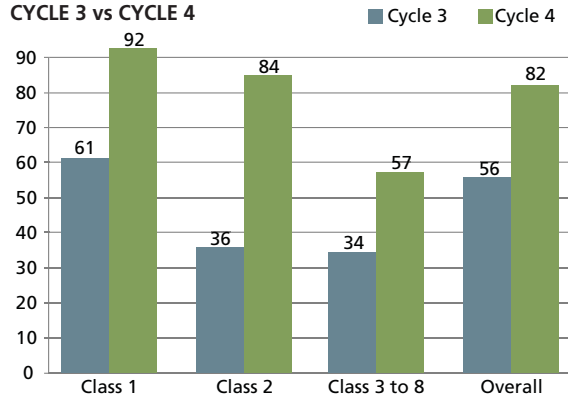
## ASSET CONDITIONS OVER TIME

The most recent cycle of RIP data available for Grand Canyon roadways and parking is Cycle 4. A comparison of Cycle 3 and Cycle 4 asset data provides a snapshot of the conditions of Grand Canyon National Park Assets over time. Between 2006 and 2012 the average roadway pavement conditions within the park improved from 56 to 82. The average parking pavement conditions also improved from 59 to 84.

### ROADWAY ASSETS

Average pavement conditions improved for all roadway classifications. The largest increase was for Class 2 roadways. Class 1 roadways also experienced a substantial increase, improving to good condition. The average roadway condition was fair (approaching good) in Cycle 4.

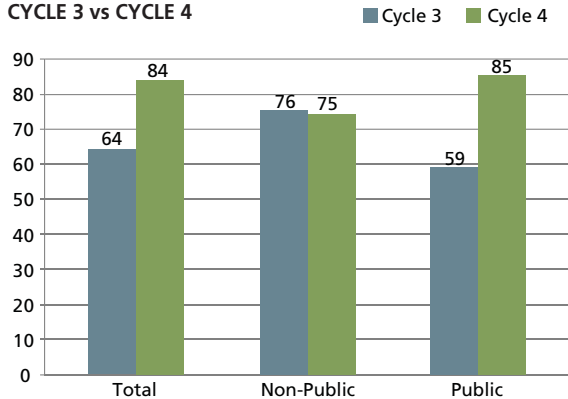
#### ROADWAY CONDITIONS CYCLE 3 vs CYCLE 4



### PARKING ASSETS

Average pavement conditions improved for public parking areas but degraded slightly for non-public areas. The average public parking condition is good for Cycle 4.

#### PARKING CONDITIONS CYCLE 3 vs CYCLE 4

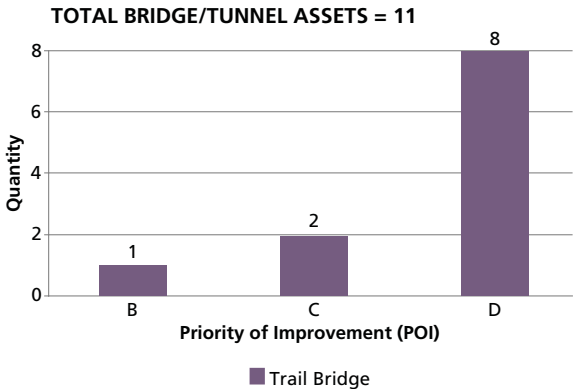


## TRANSPORTATION TRAILS

The park contains two transportation trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities." The multi-use Hermit Road Greenway connects several viewpoints along the South Rim (pedestrians only); the Greenway Trail connects the Visitor Center to the train depot within the Grand Canyon Village area, accommodates pedestrians and bicycles, and is handicapped accessible. The Visitor Center Greenway provides access to Bright Angel and South Kaibab railheads. Deferred Maintenance, Current Replacement Value, and Condition were not compiled from FMSS due to the multiple segments involved.

BRIDGE AND TUNNEL ASSETS

Bridge and Tunnel Asset  
Quantity and Condition



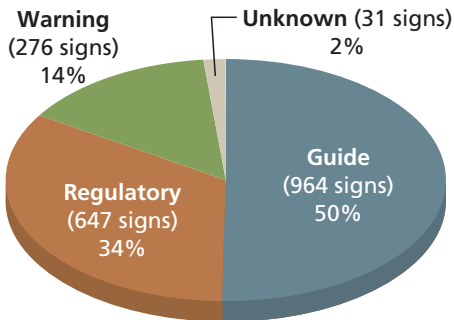
Grand Canyon National Park maintains eleven trail bridges within the park. One bridge has a POI of B indicating potential near term maintenance needs, the remaining bridges are sound and do not have immediate maintenance needs.

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TRANSPORTATION SIGN ASSETS

Sign Asset Quantity and Condition

TOTAL SIGNS = 1918



Grand Canyon National Park roadways and parking areas contain 1,918 transportation signs. Approximately 50 percent of the signs are guide signs meant to direct visitors to the desired destinations. Forty-eight percent of the signs are regulatory and warning signs. The remaining 2 percent (31 signs) have unknown types since the signs are either missing or unreadable.

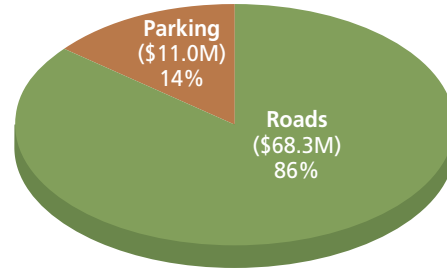
Condition	Quantity
Good	1911
Fair	7
Poor	0

## DEFERRED ASSET MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Deferred maintenance within Grand Canyon National Park totals \$79.3 million.
- Almost 86 percent of deferred maintenance is associated with park roadways.

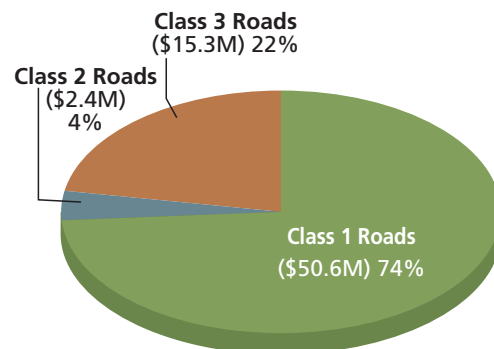
**TOTAL DEFERRED MAINTENANCE = \$79.3M**



## DEFERRED ROADWAY MAINTENANCE

- Roadway maintenance within Grand Canyon National Park totals \$68.3 million
- 74 percent of roadway deferred maintenance in Grand Canyon National Park is associated with Class 1 roadways
- A greater proportion of deferred maintenance is associated with Class 3 to 8 roadways compared to the proportion of lane miles for those classifications.

**TOTAL DEFERRED MAINTENANCE = \$68.3M**



## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks, and in Grand Canyon National Park, has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. In Grand Canyon National Park, this system includes multimodal facilities that enable visitors to get around like bus and shuttles, trails, an airport and even a train station. Not all facilities that serve to connect the region and the nation to the park are owned or operated by the National Park Service. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Some pieces of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way. Grand Canyon National Park has a well-developed bus and shuttle system that enables visitors to connect from points outside the park, to many stops inside its boundaries, and contributes in a large way to reducing congestion at key locations and times. Grand Canyon National Park also has a network of multi-use trails that allow visitors to both walk and bike between locations within the park. Finally, Grand Canyon National Park provides passenger rail service from Williams, AZ to the heard of the South Rim Village.

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### ..... -ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

Alternative transportation systems is a term applied to NPS transit operations such as shuttle buses. The Grand Canyon Shuttle system operates approximately 16 hours a day between May and August. The system provides service on four separate routes; Village Route, Tusayan Route, Kaibab/Rim Route, and Hermit Rest Route.

**Grand Canyon ATS Summary \***

<b>Annual Boardings<sup>1</sup></b>	4,775,000
<b>Service Hours<sup>1</sup></b>	66,000
<b>Service Miles<sup>2</sup></b>	640,000
<b>Quantity and Type<sup>3</sup></b>	29 low-floor buses
<b>Fuel<sup>3</sup></b>	Compressed natural gas
<b>Operating Season and Schedule <sup>3</sup></b>	May through August
<b>Operator<sup>3</sup></b>	Concessionaire
<b>Options to using the ATS</b>	Private vehicles, bicycles
	640,000

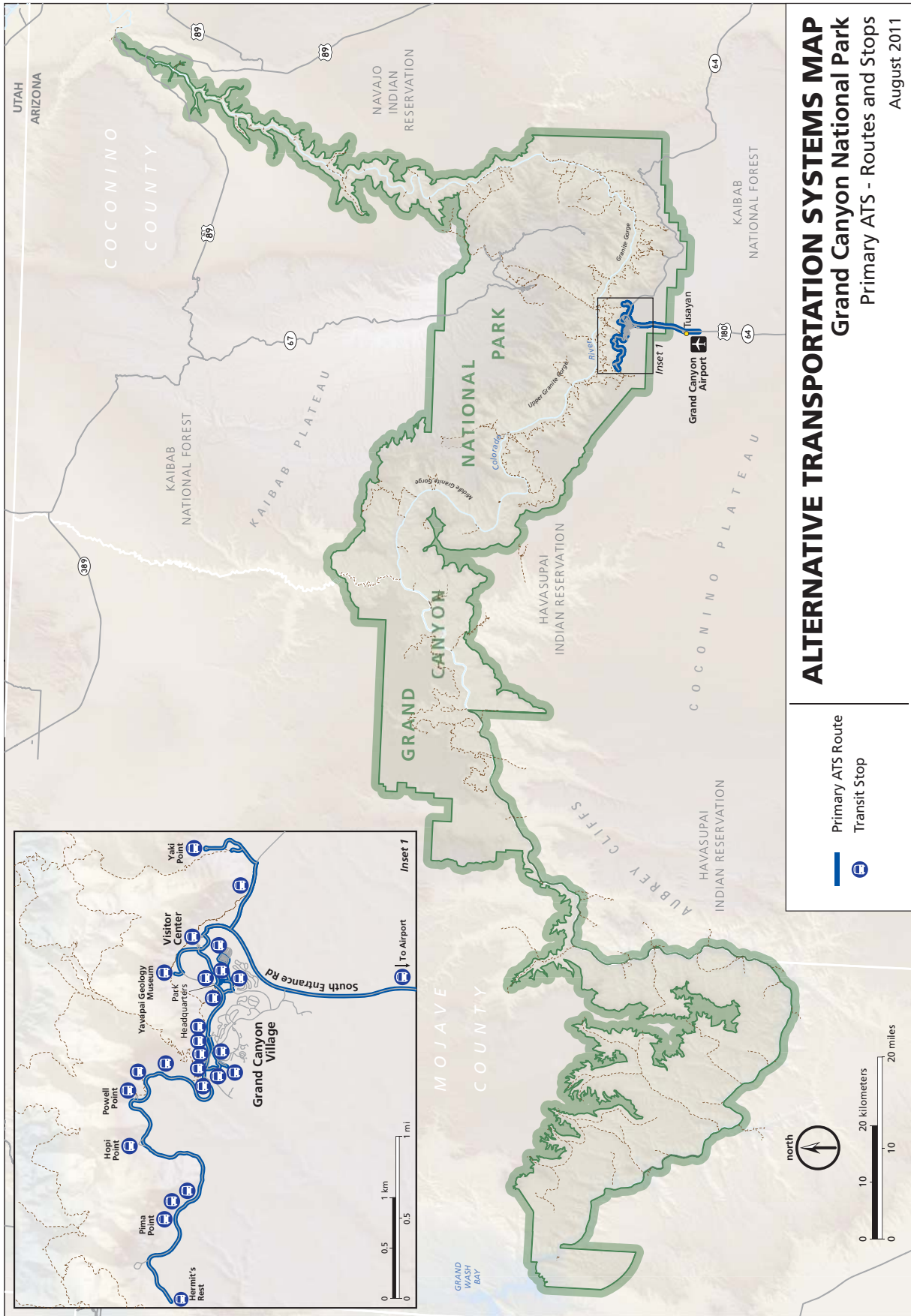
<sup>1</sup>Source: ROMO Phase II ATS PRO FORMA

<sup>2</sup>Source: 2007 Operating Statistics compiled in DEA Baseline Conditions Report

<sup>3</sup>ROMO ATS Phase II Operational and Contractual Characteristics Report

The shuttle system can be accessed at 32 shuttle stops throughout the park. The main boarding area is provided at the Grand Canyon Visitor Center, where all routes can be accessed. Unlimited rides on the shuttle are included with entrance fees. Route duration, not counting stops, is about 40 to 50 minutes on all routes except for Hermit Rest Route which has a 75 minute round trip time. During peak seasons (March – November) points along Hermit's Rest Road and Yaki Point Road are only accessible by shuttle.

The shuttle system, operated by a Grand Canyon park concessionaire, is operating at 115% of its current estimated rider capacity serving almost 4.8 million riders a year.





## GRAND CANYON AIRPORT

Operated by the State of Arizona, Grand Canyon Airport lies about 10 miles south of the park in Tusayan, AZ, and offers one asphalt-paved runway, 9,000-feet long and 150-feet wide. The runway serves approximately 250 operations per day, most of which are air taxis. Three commercial air carriers serve Grand Canyon Airport, Vision Air from North Las Vegas, NV, Grand Canyon Airlines from Boulder City, NV and Maverick Airlines from Henderson, NV.

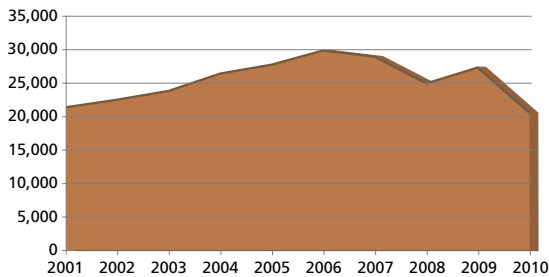
## SCENIC BYWAYS

PARK	HWY #	DESIGNATION	SCENIC BYWAY
GRCA	US 89/US89 Alt	State	Fredonia-Vermillion Cliffs Scenic Road
GRCA	SH 67	State, NSB, NFSB	Kaibab Plateau-North Rim Parkway
GRCA	Kolob Reservoir Road	State	Kolob Reservoir Road
GRCA		NSB	Historic Route 66
GRCA	Kolob Canyon Road	State	Kolob Fingers Road Scenic Byway
( www.nps.gov )			
NSB = National Scenic Byway, NFSB = National Forest Scenic Byway, State = State Scenic Byway			

Grand Canyon National Park is a destination on the Grand Circle (see page 46).

## GRAND CANYON RAILWAY

Annual Train Passengers



Grand Canyon Railway provides daily service between Williams, AZ, and the South Rim Village. The rail route travels 130 miles across the Colorado Plateau. The train travels in each direction once daily. The 2 hour and 15 minute ride departs Williams each morning at 9:30 am and returns at 5:45 pm, providing visitors about 3 and one-half hours to visit the south rim of the canyon. The railway is operated by Xanterra Parks & Resorts, a concessionaire with the National Park Service. Tickets start at \$8 per person and include the Grand Canyon National Park entry fee. In the peak month of

July approximately 22,000 visitors arrive via Grand Canyon railway. Since 2006, the number of visitors arriving by train decreased.

## MULTI-MODAL CONNECTIVITY

The South Rim of Grand Canyon provides two multi-use paths, the Paved Rim Trail and the Paved Multi-Use Greenway Trail. The paved Rim Trail provides pedestrian access from Grand Canyon Visitor Center to Maricopa Point along the South Rim of the canyon. The shuttle system connects at points along the entire length, enabling visitors to combine walking with riding the shuttle as desired. The paved multi-use Greenway trail provides pedestrian, handicapped, and bicycle access from Bright Angel to South Kaibab Trailhead. The majority of this trail travels within the Grand Canyon Village area. Additionally, the park is currently constructing a multi-use greenway trail that will link to the gateway community of Tusayan.

The addition of bicycle rental services in 2010 has been financially successful and well received by visitors. All of the park's shuttle buses have the capacity to carry three bicycles.

## GRAND CANYON NATIONAL PARK TRANSPORTATION HIGHLIGHT

In 2010, Grand Canyon National Park introduced bicycle rental service to the South Rim village. The rental service is provided by Bright Angel Bicycle Rentals, a park concessionaire. The service is currently a first-come, first-serve operation that rents bicycles and trailers to park visitors. The concessionaire also provides a bicycle shuttle to give visitors the best access to bicycle trails.

Multiple bicycle routes are available along the South Rim ranging from 6 miles to 21 miles in length. Bright Angel Bicycle Rentals provides information to help visitors determine which route best meets the desired park experience. Each bicycle route is served by free visitor shuttle routes that circulate throughout the South Rim village. The concessionaire also provides bicycle tours for visitors who desire an educational tour while enjoying a bicycle ride.

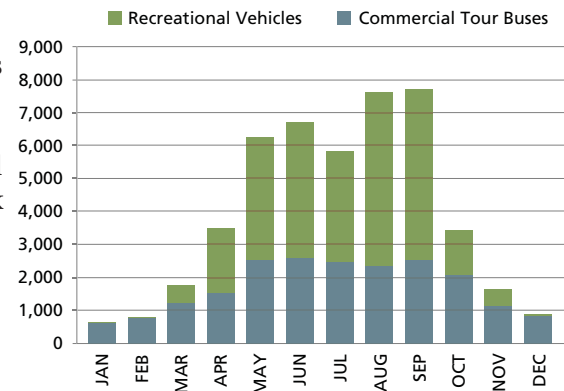
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## CONGESTION

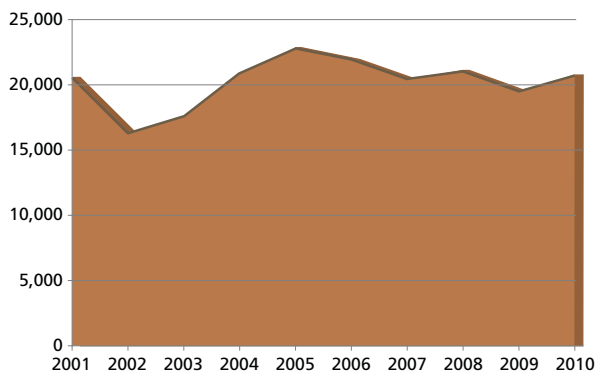
The number of vehicles entering Grand Canyon National Park increased from 2002 to 2010. The peak visitation month in 2010 was July. Grand Canyon National Park welcomes approximately 6,690 vehicles on a peak visitation day.

During peak season, approximately 6,000 commercial tour buses and RVs visit Grand Canyon National Park in a month. The number of RVs is typically twice the number of commercial tour buses.

### Commercial Tour Bus and RV Vehicles

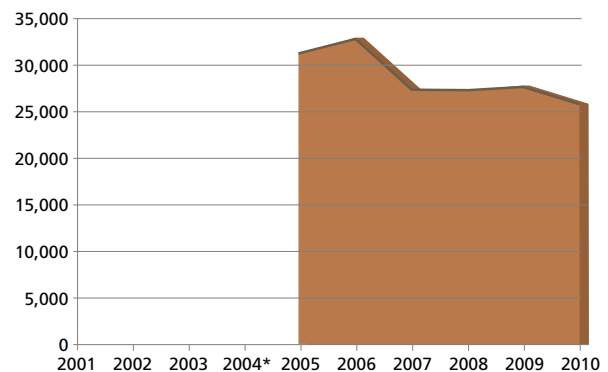


### Annual Commercial Tour Bus Volumes



The number of buses visiting Grand Canyon National Park has remained steady and slightly decreased since 2005.

### Annual RV Overnights



The number of RVs entering the park also appears to be decreasing based on the number of overnight RV stays in the park.

## ..... CONGESTED LOCATIONS

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff identified several congested areas within the park. All identified locations are on the South Rim of the Grand Canyon. The areas include parking areas at the Visitor Center, Yaki Point and Market Plaza, the Kaibab Trailhead, and transit stops on the Village Route.

Congestion Areas	Locations Identified
Parking Areas	Visitor Center Lot #2 Yaki Point Picnic Area Market Plaza Lot B
Trailheads	Kaibab Trailhead (overflows onto road and into picnic area)
Transit Stops	Village Route Transfer Visitor Center – Village Route Stop

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## ..... CONGESTION MITIGATION STRATEGIES

Park staff identified five congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey. These strategies are focused on operations and mobility. Park staff has indicated success with implementing these programs and achieving reduced levels of congestion.

Congestion Mitigation Strategy *	Mitigation Result
Alternative Transportation System (ATS)	Transit system reduces vehicle traffic substantially – visitors who use the system generally park once, reducing the overall need for additional parking.
Promote Pedestrian and Bike Access	Part of the success of bicycle and pedestrian access has come with the provision of amenities – bike trails/routes, a bike rental facility, and information about how to use transit in combination with biking/hiking opportunities.
Expanded Parking Supply	Has been a huge help, however, the park needs to provide more information letting visitors know where available parking and when lots are full.
Remote Parking with Shuttle	Strongly supported by the gateway community where the remote lots are located.
Work with local communities	Tusayan, Flagstaff and Williams are all strong supporters of alternative transportation and are willing to promote opportunities.

\* Source: Service-Wide Congestion Management System (CMS); Phase 1: Emphasis Area Identification, Technical Memorandum 7: Compiled Congestion Survey

## ITS STRATEGIES .....

Park staff identified three congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey. These strategies are focused on the dissemination of park information to visitors. The success of each strategy was also documented. Park staff noted that the use of these information sources in conjunction with one another helped increase transit use from the Village of Tusayan by 25 percent.

ITS Strategy	Mitigation Result
Highway Advisory Radio (HAR)	The HAR is used to inform visitors of construction related traffic issues as well as provide shuttle information for the Town of Tusayan.
Traffic Information	Helps visitors make informed decisions.
Variable Message Signs	Used in combination with the HAR, transit use from the gateway town of Tusayan to the park increased by 25 percent.

The 2011 Update on ITS in the NPS report by the Volpe Center shows the following ITS strategies in use in Grand Canyon National Park.

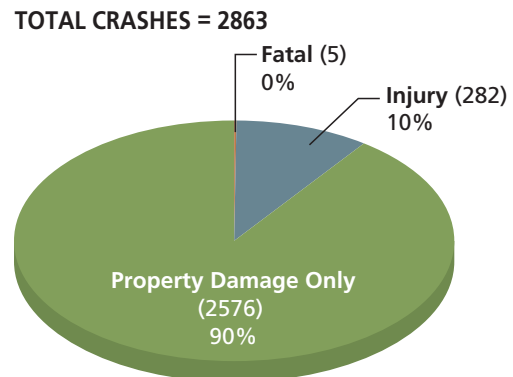
Dynamic Message Signs (portable and permanent)	511 System Integration	Highway Advisory Radio	Trip Planning Tools (Innovative)	Loop Detectors / Traffic Counters	Road Surveillance	Automated Entry System	In-Vehicle Electronic Information	Coordinate with Other Agencies
x	x	x	x	x	x	x	x	x

*2011 Update on ITS in NPS, Volpe Center*

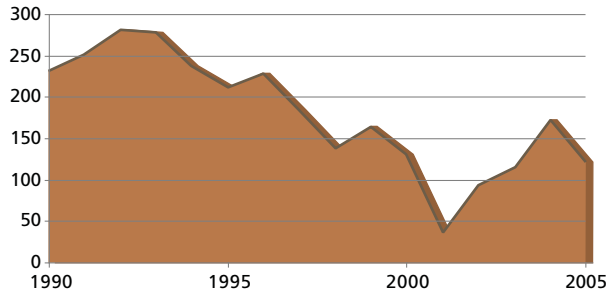
Grand Canyon National Park eMagazine and podcasts offer visitors a virtual trip through the park's features and attractions to aid in trip planning.

## CRASH SEVERITY .....

Grand Canyon National Park experienced 2,863 crashes between 1990 and 2005. Five of these crashes included a fatality and 282 included at least one injury. The majority (90%) were property damage only.

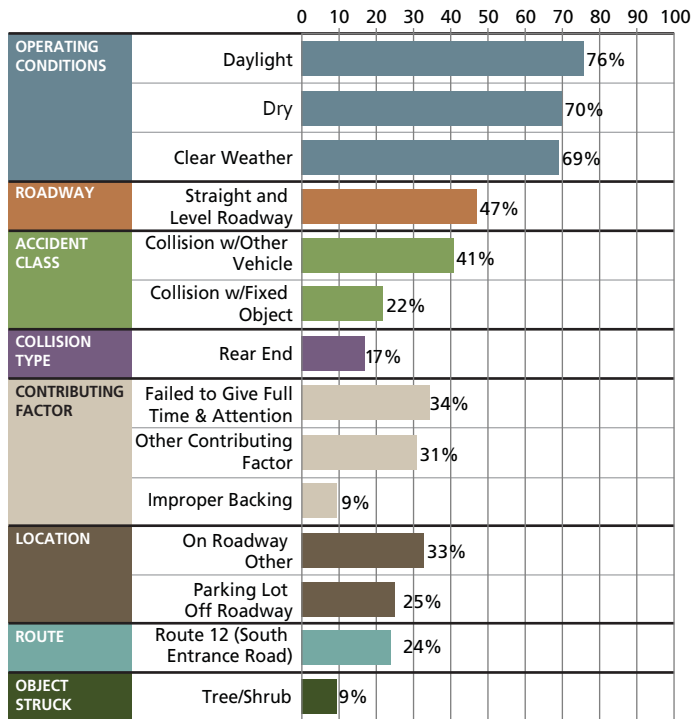


## ANNUAL CRASHES



Grand Canyon National Park averages approximately 179 crashes each year. The park has experienced an annual decline in crashes of approximately 9.8 percent per year since 1990. The crash rates within Grand Canyon National Park are not identified as higher than expected based on State of Arizona crash experience.

## CRASH CONDITIONS (1990-2005)



A majority of crashes in Grand Canyon National Park occur during daylight and dry conditions, however one-quarter of crashes occur during night-time hours. Collisions with other vehicles and fixed objects account for 63 percent of crashes. About a quarter of crashes occur in parking lots.

## VISITOR EXPERIENCE

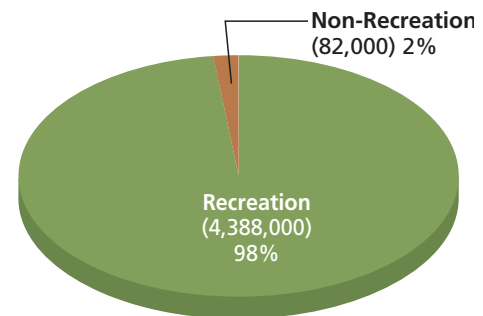
The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information that the National Park Service collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Grand Canyon National Park. With close to 4.4 million visitors annually to this spectacular spot, the National Park Service is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park. Grand Canyon National Park's podcasts and Canyon Sketches eMagazine make it easier to plan a trip and spend time in meaningful ways, whether is taking in the rare geology, hiking along or into the canyon, or enjoying sunrises and sunsets.

### 2010 VISITATION

Grand Canyon National Park had approximately 4,390,000 recreational visitors in 2010. About 2 percent of park traffic is non-recreational, and most of those trips were from through traffic on Arizona Highway 64, which traverses the southern rim of the park.

#### 2010 Visitation

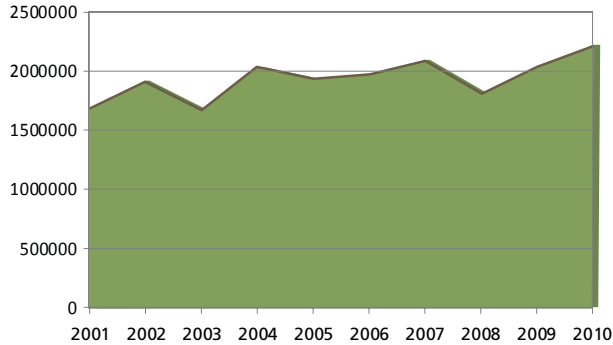
**TOTAL VISITORS = 4,470,000**





## ANNUAL VISITATION

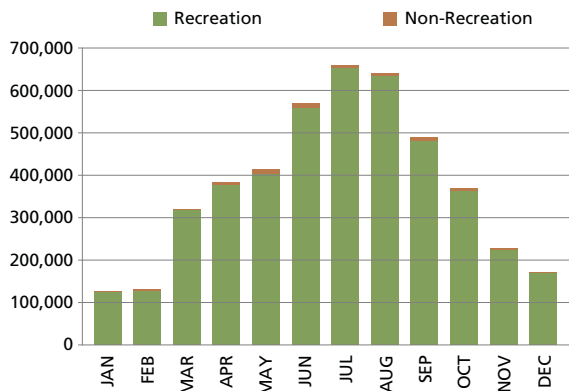
Recreation Visitation 2001-2010



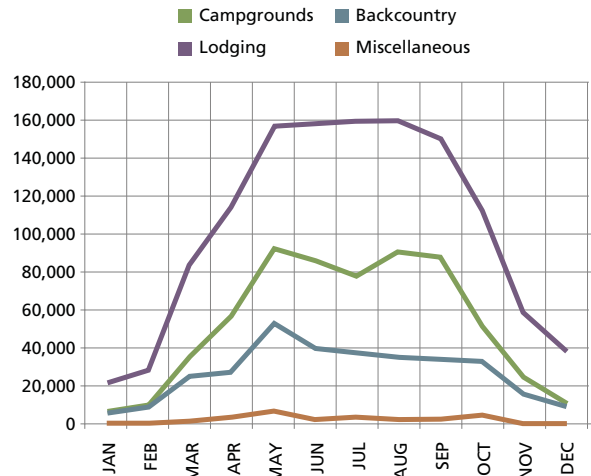
Visitation has been steady in recent years but has decreased by about 0.7 percent per year since 2000. Non-recreation trips have been decreasing by about 13.7 percent per year. In 2003, 92 percent of visitors were from the U.S., and 67 percent were visiting Grand Canyon National Park for the first time. Peak visitation months are June, July and August, however over 100,000 visitors enter Grand Canyon National Park on a monthly basis in December, January and February. Approximately 160,000 monthly overnight stays occur from May through September, when both North and South Rims are open.

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Visitors By Month



Overnight Stays By Month

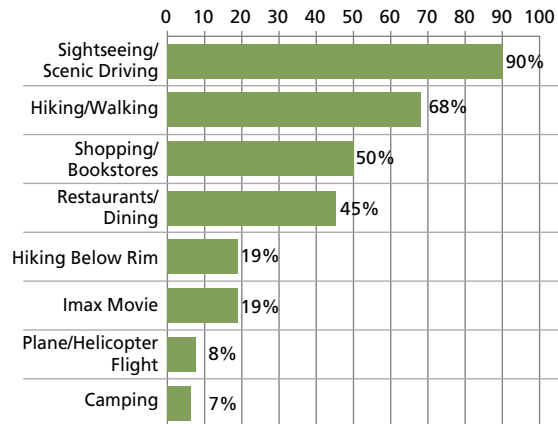


## VISITOR ACTIVITIES

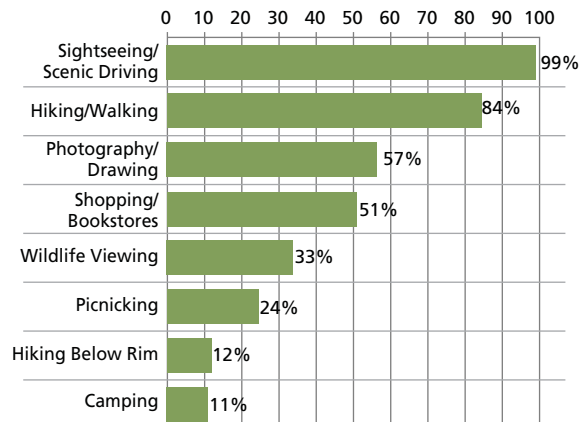
A majority of visitors participate in three primary activities, Sightseeing/scenic driving, walking/hiking and shopping/bookstores. Photography/drawing is also an activity that a majority of north rim visitors participate in. Only about 15% of visitors hike below the rim at Grand Canyon National Park, the great majority of visitors remain at rim level during their visit.

Other popular visitor activities include the annual Grand Canyon Star Party which is held for a week each June. The event is held on both the North and South Rims of the park with the Tucson Amateur Astronomy Association and the Saguaro Astronomy Club of Phoenix. At the Star Party, amateur astronomers from across the country volunteer their expertise to offer free nightly astronomy programs and telescope viewing. Visitors have a chance to view the planet Saturn along with a wide assortment of star clusters, galaxies and nebulae by night. Grand Canyon National Park is one of the best night sky observing sites in the United States because it has some of the darkest skies and cleanest air in the country.

### SOUTH RIM

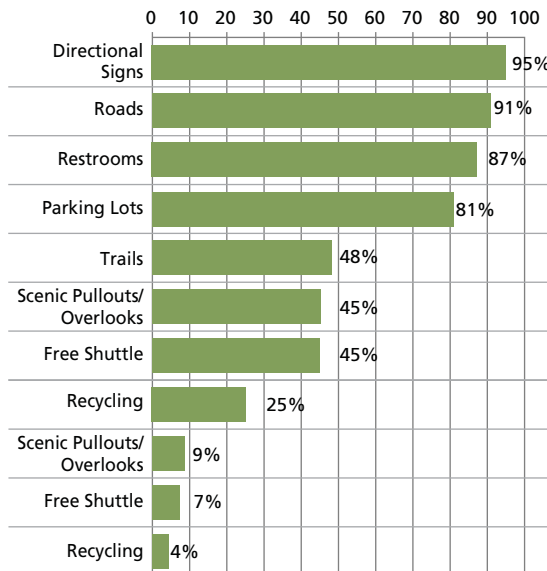


### NORTH RIM



• VISITOR SERVICES USED

**SOUTH RIM**

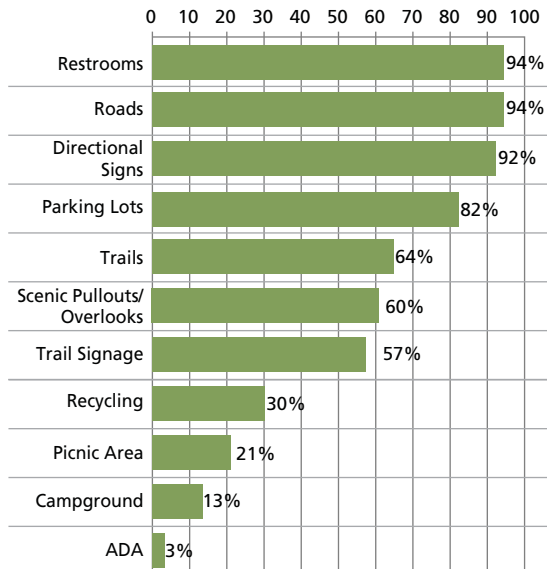


Most park visitors (89%) obtain park information prior to their visit. In fact, an eMagazine and several podcasts are available for download from the Internet. They describe various aspects of the park, including an overview of park history and geology, viewpoints, hiking trails, scenic drives; wildlife; and the historic Grand Canyon Lodges.

Surveys have indicated less than one in four visitors used park recycling, picnic areas, campgrounds or ADA facilities. In 2003, 45 percent of visitors used the park's shuttle bus system at the South Rim. Visitors to the North Rim are more likely to use trails than visitors to the South Rim (64% to 48%). The four primary services used are directional signs, roads, restrooms and parking lots.

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**NORTH RIM**



## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP, 2003, stated detractions/negative visitor comments : parking; poor road directional signs; road construction; use shuttle to reduce car traffic
- 2010 CMS Survey
  - Congested locations: parking areas, transit stops, trailheads
  - Strategies: ATS, remote parking with shuttles, worked with local communities, promoted bicycle/pedestrian access, expanded parking supply
- Surveys & Interviews, 2011
  - Congested locations: South Rim Village area, bus stops, North Rim parking lots (North Kaibab Trailhead, Grand Canyon Lodge area)
  - Strategies: entrance station improvements (road widening, bypass lane, stacked fee booths); expanded parking at visitor center; improved shuttle infrastructure; addition of bicycle rental services; addition of and improvements to pathways, multi-use greenway trails, pedestrian and bicycle infrastructure; VMS, HAR, website, and park newspaper; seasonal “transportation ambassadors”

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in Grand Canyon National Park.

## AIR QUALITY AND GHG EMISSIONS

The park is located near the Las Vegas/Clark County, NV, non-attainment area that is monitored for 8-hour ozone and particulate matter (PM-10).

The park completed an internal baseline assessment of greenhouse gas (GHG) emissions in 2008. This assessment gives the park the opportunity to track the change in emissions over time. The Grand Canyon National Park Action Plan set the following emission reduction goals:

- reduce GHG emissions from park operations by 30% below 2008-level by the year 2020
- reduce transportation-related GHG emissions from park operations 20% by 2020

Sector	2008 Total GHG Emissions (MTCO2E)	2008 Park Operations GHG Emissions (MTCO2E)
Energy	30,955	11,208
Transportation	21,811	2,585
Waste	2,149	2,149
Other	556	44
Total	55,471	15,985

Grand Canyon National Park Action Plan, 2009

## SIGNIFICANT RESOURCES

Grand Canyon is significant because it is one of the planet's most iconic geologic landscapes. During the last six million years, the Colorado River carved Grand Canyon; these same erosional and tectonic processes continually shape the canyon today. Grand Canyon's exposed layers span more one third of Earth's history and record tectonic and depositional environments ranging from mountain-building to quiet seas. Taken as a whole, Grand Canyon, with its immense size, dramatic and colorful geologic record exposures, and complex geologic history, is one of our most scenic and scientifically valued landscapes.

## HISTORIC ROADS

Historic roads in the village area account for about 2% of the park's road system. About 6% of the park's parking area is listed as historic.

## THREATENED AND ENDANGERED WILDLIFE AND PLANT SPECIES

Common Name	Species Name	Listing Category	Status in Park
WILDLIFE			
Bald eagle	<i>Haliaeetus leucocephalus</i>	Delisted Monitored	Current
California condor	<i>Gymnogyps californianus</i>	Experimental	Occasional
Desert tortoise	<i>Gopherus agassizii</i>	Threatened	Current
American peregrine falcon	<i>Falco peregrinus anatum</i>	Delisted Monitored	Current
Humpback chub	<i>Gila cypha</i>	Endangered	Current
Kanab ambersnail	<i>Oxyloma haydeni kanabensis</i>	Endangered	Current
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	Current
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	Current
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	Endangered	Current
Black-footed ferret	<i>Mustela nigripes</i>	Endangered	Historic
Bonytail chub	<i>Gila elegans</i>	Endangered	Historic
Brown bear	<i>Ursus arctos</i>	Threatened	Historic
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	Endangered	Historic
Gray wolf	<i>Canis lupus</i>	Endangered	Historic
Little colorado spinedace	<i>Lepidomeda vittata</i>	Threatened	Historic
Razorback sucker	<i>Xyrauchen texanus</i>	Endangered	Historic
PLANTS			
Sentry milk-vetch	<i>Astragalus cremnophylax</i>	Endangered	Current

## SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Grand Canyon National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

### REGIONAL AND COMMUNITY STAKEHOLDERS .....

Grand Canyon National Park is located in a very rural area of northern Arizona. Most visitor services available outside the North Rim entrance are several hours from the park entrance. The town of Tusayan, AZ provides gateway community services outside the South entrance. Arizona state highways maintained by ADOT provide access to both rims of the park. The park is surrounded by lands under special management. The BLM and National Forest Service manage most lands to the north of Grand Canyon. To the east and south, the Navajo, Havasupai, and Hualapai Indian Reservations manage large portions of bordering lands.

Regional Communities	<ul style="list-style-type: none"> <li>• Tusayan, AZ</li> <li>• Williams, AZ</li> <li>• Valle, AZ</li> <li>• Jacob Lake, AZ</li> </ul>
Regional MPOs	<ul style="list-style-type: none"> <li>• Flagstaff MPO (FMPO)</li> </ul>
US Forest Service	<ul style="list-style-type: none"> <li>• Kaibab National Forest</li> </ul>
US Bureau of Reclamation	<ul style="list-style-type: none"> <li>• Lake Mead</li> </ul>
US Bureau of Land Management	<ul style="list-style-type: none"> <li>• Grand Canyon-Parashant National Monument</li> </ul>
Arizona DOT (ADOT)	<ul style="list-style-type: none"> <li>• US 89A</li> <li>• US 180</li> <li>• SH 64</li> <li>• SH 67</li> </ul>
Indian Nations	<ul style="list-style-type: none"> <li>• Havasupai</li> <li>• Hualapai</li> <li>• Navajo</li> </ul>



..... **TRANSPORTATION RELATED PARTNERSHIPS**

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

**Existing Partnerships**

The park has a positive relationship regarding transportation with the gateway community of Tusayan, surrounding Coconino County and the Arizona Department of Transportation. In 2008, the park began a pilot shuttle bus route connecting Tusayan with the park's South Rim Visitor Center and the in-park shuttle bus system and allowing visitors to leave personal vehicles outside the park.	
Grand Canyon Association	The Association relies on the generosity of private individuals, foundations, and corporations to support projects and programs that are beyond the financial capacity of the National Park Service.
Grand Canyon Field Institute	The Grand Canyon Association's long-standing education program, provides great opportunities to learn about, volunteer and explore Grand Canyon
Grand Canyon Private Boater's Association	

GRCA

..... **CLIMATE FRIENDLY PARKS**

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Grand Canyon National Park is a certified CFP.

**Transportation Related Strategies**

Strategy	Reduce emissions from park facilities and operations by identifying and implementing emission mitigation actions
Transportation Management (TM) Emission Reduction Goal	Reduce transportation-related GHG emissions from park operations 20% by 2020
TM Planned Action 1	Reduce NPS vehicle and equipment fuel consumption (develop a green fleet management plan, right-size the fleet, promote efficient driving through training and signage, use alternative fuel vehicles, develop a no-idling policy)
TM Planned Action 2	Reduce GHG emissions from visitors (promote use of trails, expand greenway trail network, explore use of bike lanes, partner with surrounding communities on alternative transportation initiatives, and more)
TM Planned Action 3	Other (evaluate adaptive TM strategies, provide advanced warning of parking conditions via VMS, deploy additional transit capacity when needed, and more)

(Grand Canyon National Park Action Plan)

## PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS .....

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

### VISITOR EXPERIENCE

- Capacity and Congestion
  - Significant structural and operational improvements over the last few years have decreased congestion and improved the visitor experience on the park's South Rim.
- Parking
  - The addition of 900 parking spaces at visitor center have reduced parking congestion and parking in undesig-nated areas. However, this is still an issue at the historic South Rim Village where available parking can be hard to find. Parking shortages are noticeable for hotel and day visitors.
  - Plans call for an advanced information system to inform visitors when private vehicle parking in the park or in certain congested areas of the park is full. This system has not been implemented at this time (the project is ready and can be implemented when funding becomes available).
  - North Rim parking lots are congested during peak times, causing overflow parking on road shoulders.
- Visitor Information Systems
  - A multi-layered visitor information system helps disseminate information, yet the planned advanced system to inform visitors of full lots has not been implemented and is awaiting funding.
- ATS
  - Shuttles are at or near capacity. The park would like additional shuttles. However, due to policy concerns, shuttle operator housing cannot be built. Visitors wait 3 to 4 shuttles before a seat is available. Shuttle funding is inadequate.
  - The addition of a new central hub and improved shuttle services has been a great improvement, however the Hermit and Village routes are still over capacity causing crowding and long wait times.
  - Improved shuttle support infrastructure is still a great need.
- Bicycling and Pedestrians
  - During peak times the Park averages 400 to 500 bicycles per day.
  - Bicycle and pedestrian facilities have been upgraded but much remains to be done to improve the multi-use greenway trail.
  - The Park has a highway advisory radio and variable messaging signs south of Tusayan to inform visitors of the highway advisory radio and of the opportunity to park in Tusayan and ride the park's shuttle bus system into the park. The variable messaging signs and radio station are also used to inform visitors of closures or events in the park (i.e., wildland fire and construction).

### RESOURCE PROTECTION

- Resources at Risk
  - New caps on air tours in Park airspace promises to mitigate noisy intrusions into sensitive areas.
  - In some park areas, however, congestion, parking along roadways and social trailing remain a problem (Pipe Creek Area, South Kaibab area, etc).
  - Vehicle/animal conflicts are a significant problem, including mountain lions, deer, and elk.
- Concentrated Impacts
  - The park limits private vehicle use in some areas by allowing access by shuttle bus only, but is not currently considering overall limits on visitation through permitting or reservations.
  - Impacts to resources remain in some congested areas without adequate infrastructure or management (ie veg-etation impacts due to social trailing and parking in Pipe Creek and Kaibab Trail areas; private vehicle crowding in historic South Rim Village area affecting historic landscape and visitor experience).
  - Additional resource damage is caused by lack of adequate support facilities for park's shuttle bus system (i.e., adequate and updated fueling system, bus wash, holding and maintenance facilities).

## SUSTAINABLE OPERATIONS

- Climate Change
  - The park faces threats to resources that include changing weather patterns, changing vegetation patterns, changing wildlife patterns and changing water availability. Grand Canyon National Park is a Climate Friendly Park and monitors key indicators and standards for changing environmental conditions. The park's shuttle bus system, improvements to bicycle and pedestrian pathways, development and implementation of a bicycle rental service, development and implementation of an employee bicycle share program and employee and visitor education will all be integral to the plan. As of 2008, the park replaced all remaining diesel fueled buses with buses fueled by compressed natural gas. The park's fleet is now 100% natural gas fueled and has significantly lower emissions. Natural gas is also considered an alternative fuel under the Clean Air Act.

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# Grand Teton National Park

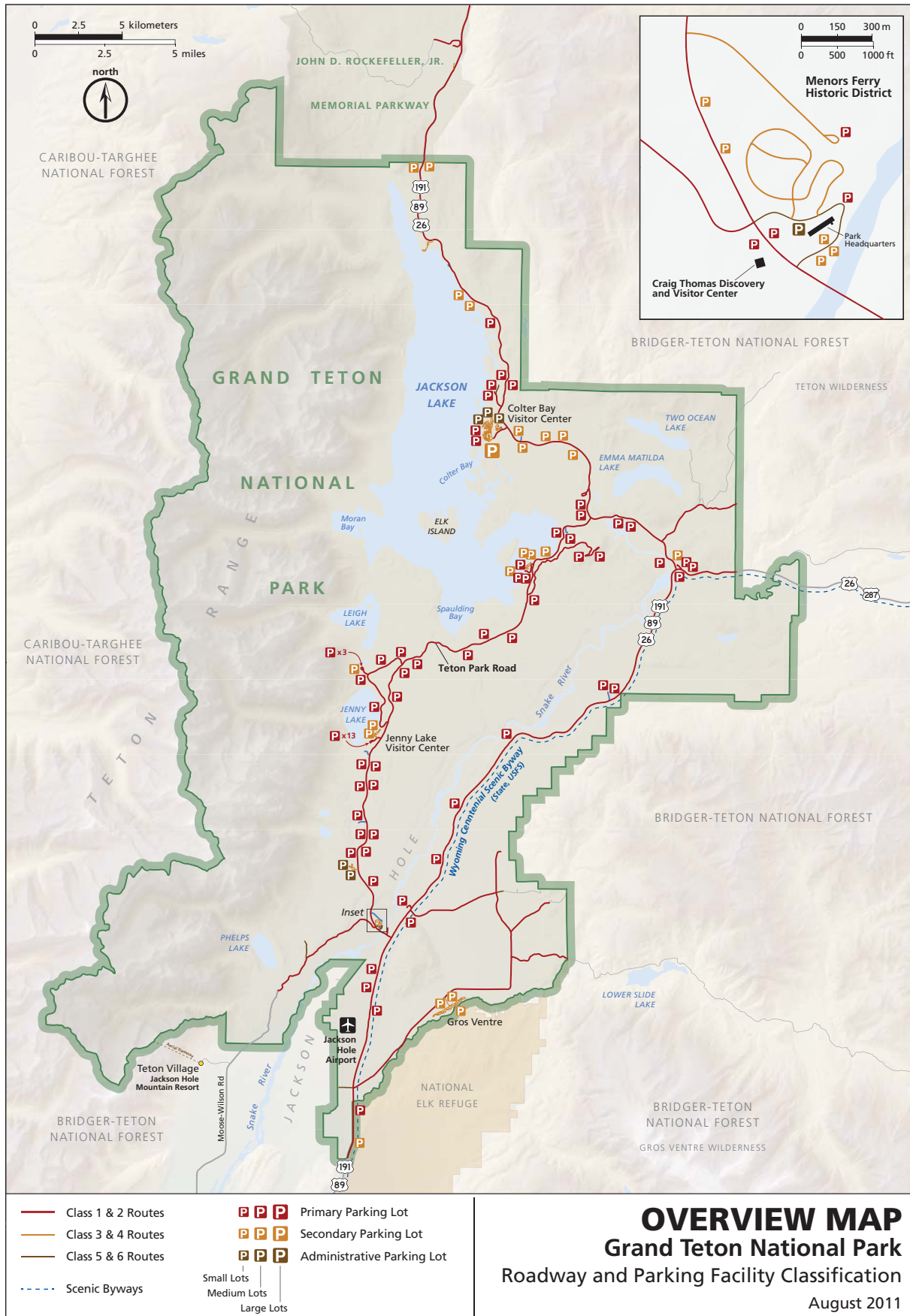
(GRTE)



GRTE



INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT





# GRAND TETON NATIONAL PARK (GRTE)

## AT A GLANCE

**STATE:** Wyoming **SIZE:** 484 square miles **TYPE:** Rural

### ROADWAY/PARKING CONDITION (CYCLE 4)

	PCR	DM	Lane Miles	Area/Spaces
Roadways	82 / FAIR	\$66.5 Million	267	–
Parking	65 / FAIR	\$18.5 Million	–	2,665,000 SF / 4,370
Replacement Value of All Transportation Assets			\$423.6 Million	

Asset Management

### CONGESTED AREAS

- Parking areas

### ALTERNATIVE TRANSPORTATION SYSTEM

Annual Boardings	no transit
Fuel Type	not applicable

### FEES

Transportation Fee	No
FLREA (% retention)	80

Mobility, Access,  
& Connectivity

### VISITATION (2010)

Total Visitors	4,002,000
Non-Recreation Visitors	1,333,000
Recreation Visitors	2,669,000
10-Year Trend	-0.9%

### VISITOR EXPERIENCE QUALITY SCORE

Roads	Parking	Date
79	81	2008

(University of Idaho Survey)

### TOP ACTIVITIES

- Viewing scenery/scenic drive
- Hiking/walking
- Photography

Visitor Experience

### AT-RISK RESOURCES

- Scenic views
- Wetlands
- Wildlife
- Water quality

### TRANSPORTATION/RESOURCE ISSUES

- Wildlife/vehicle crashes
- Stormwater runoff

### MAJOR HISTORIC TRANSPORTATION ASSET

- Jackson Lake Lodge Loop & Parking Area

Resource  
Protection

### KEY PARTNERS

- Grand Teton National Park Foundation
- Greater Yellowstone Coordinating Committee
- Town of Jackson
- Teton County
- WYDOT/District 3

Climate Friendly Park Status	In-process
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Green House Gas Emissions	22,404 Metric Tons
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(CLIP)

Sustainable  
Operations

GRTE

### Key Transportation Findings and Challenges

<b>Asset Management</b>	There was little change in roadway PCR from Cycle 3 to Cycle 4. Current average PCR is 82.
	\$87.6 M in deferred maintenance of transportation assets, about 10% of total IMR DM.
	92% of public parking areas in Poor or Fair condition. Average PCR declined from 82 (Cycle 3) to 64 (Cycle 4).
<b>Mobility, Access, &amp; Connectivity</b>	Over 5,000 large vehicles (primarily RVs) visit monthly during peak season.
	The park must balance its needs for access with fiscally sustainable policies.
	36% of vehicle crashes are with an animal; 60% of all crashes occur on Hwy 89, the higher speed route between Jackson and Moran Junction.
<b>Visitor Experience</b>	2010 Recreation Visitation 2,669,374 (Large).
	Recreation visitation grew 0.6% annually 2001-2010.
	33% of visitation is non-recreational and contributes to maintenance needs, safety concerns, and resource impacts.
	Pathway project will increase multiuse trails and bicycle connectivity to Jackson.
<b>Resource Protection</b>	Stormwater runoff, especially for roadway side slopes and stream banks, present significant maintenance problems. High runoff occurs in early summer following heavy snowfall in late spring.
	Sensitive wetlands adjacent to park roads provide critical habitat for numerous "charismatic mega-fauna" (elk, bison, moose).
	Vehicle/animal collisions are a problem for the park. Extensive wildlife mortality is reported on park roads.
	Non-native vegetation has invaded disturbed areas along roadways.
	9% of roadway lane miles are designated as historic, including the Jackson Lake Lodge Loop and Lodge Main Parking Area.
<b>Sustainable Operations</b>	Climate Friendly Park certification in process.
	Multiple jurisdictions associated with the park create a difficult environment for effective use of funds.
	The near urban conditions in and around Jackson, with high levels of commuting on park roads, carry significant resource protection issues – wildlife/vehicle conflicts, stormwater run-off to sensitive wetlands and other habitats, the introduction of invasive species.
	Experimenting with matching carrying capacity to parking spaces.

## MISSION

The National Park Service, through Grand Teton National Park, is dedicated to the preservation and protection of the Teton Range and its surrounding landscapes, ecosystems, cultural and historic resources. The singular geologic setting makes the area and its features unique on our planet. Human interaction with the landscape and ecosystem has resulted in an area rich in natural, cultural and historic resources that represents the natural processes of the Rocky Mountains and the cultures of the American West.

## PARK DESCRIPTION

Grand Teton National Park is located in northwestern Wyoming. The park is 484 square miles in size and was established in 1929. The park was established to preserve a mountainous landscape with pristine lakes and extraordinary wildlife. The park includes the major peaks of the 40 mile lone Teton Range, a fault-block mountain formation, as well as the northern portion of a wide valley known as Jackson Hole. Rising more than 7,000 feet above the valley of Jackson Hole, the Teton Range dominates the park's skyline. The park is known for its scenic vistas, wildlife, wildflowers, and glacial lakes and streams.

The first euro-American explorer to enter Jackson Hole is considered to be John Colter after he left the Lewis and Clark expedition in 1806. Fur trappers soon followed seeking the wealth that came from selling the pelts of animals native to the area, leading to the rapid decline of the local beaver population. The first year round residents arrived in the valley in 1884. In 1926, John D. Rockefeller, Jr. toured the area and began buying large tracts of land in the valley with the intention of preserving the natural beauty of the area. In 1972, the John D. Rockefeller, Jr. Memorial Parkway was established connecting Yellowstone and Grand Teton National Parks.

## PARK LOCATION

Grand Teton National Park is located in northwestern Wyoming directly south of Yellowstone National Park. The park is 10 miles from Jackson, WY; 115 miles from Idaho Falls, ID; and 260 miles from Billings, MT. The closest major cities include Salt Lake City, UT (300 miles); Cheyenne, WY (415 miles); and Denver, CO (510 miles).

Nearby National Park Service units include:

- John D. Rockefeller, Jr. Memorial Parkway (30 miles)
- Yellowstone National Park (55 miles)
- Craters of the Moon National Monument and Preserve (180 miles)
- Fossil Butte National Monument (180 miles)

## TRANSPORTATION OVERVIEW

Grand Teton National Park provides 267 lane miles of roadway and 2,665,000 square feet (4,370 spaces) of parking infrastructure. A non-motorized multi-use trail connects the Jenny Lake Visitor Center to the Moose Junction entrance of the park. A concessionaire operated lake shuttle provides access across Jenny Lake from Jenny Lake Visitor Center to Inspiration Point. Jackson Hole Airport lies entirely within Grand Teton National Park, the only airport in the United States to be located within a National Park. The park has no direct administrative function related to the airport; however, the FAA, airport, county, and Jackson regularly consult NPS on environmental mitigation issues including noise and wildlife hazards.

The park has four primary entrance locations, Moose Junction, Moran Junction, North Entrance and Moose-Wilson Road. Regional highways that provide access to Grand Teton National Park include Wyoming State Highway 22 from the west, US Highway 26/287 from the east, US Highway 89/191/287 from the north and US Highway 26/189/191 from the south. Within the park, Teton Park Road connects Moose Junction and Jackson Lake providing access to Jenny Lake Visitor Center and Signal Mountain.

## ASSET MANAGEMENT

The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Grand Teton National Park transportation assets is \$423.6 million.

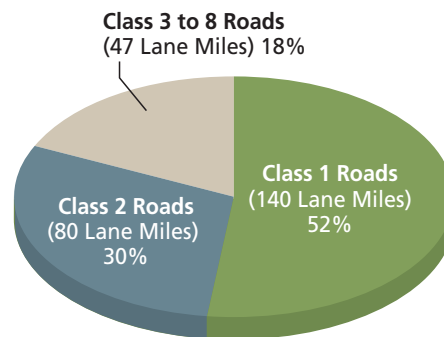
### Grand Teton National Park Roadway and Parking Assets

- Approximately 267 lane miles of roadway network on 139 different routes.
- Approximately 2,665,000 square feet (4,370 spaces) of parking area provided in 209 identified parking areas.
- 220 Lane miles are defined as Class 1 or 2 roads (82%).

### ROADWAY ASSETS

Class 1 & 2 roadways account for 82 percent of roadways in Grand Teton National Park. Approximately 2 percent of roadways are Class 5 & 6, indicating very few administration specific roadways. Grand Teton National Park has a higher proportion of Class 1 & 2 roadways compared to other parks in the IMR.

TOTAL LANE MILES = 267



### ROADWAY PAVEMENT CONDITION RATING (PCR)

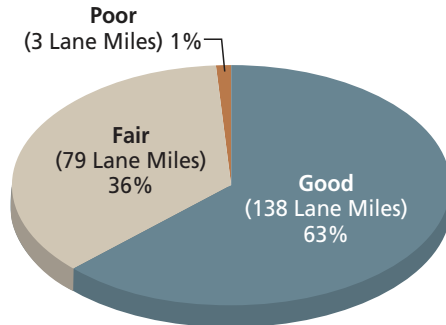
The Class 1 roads have an average PCR rating of good and the Class 2 roads have a fair rating. The Class 3 to 8 roads are rated fair. The overall average roadway condition in the park is fair.

Roadway Type	Average PCR*
All Roadways	82 - FAIR
Class 1	89 - GOOD
Class 2	79 - FAIR
Class 3 to 8	73 - FAIR

\*Cycle 4 RIP data

## .....CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

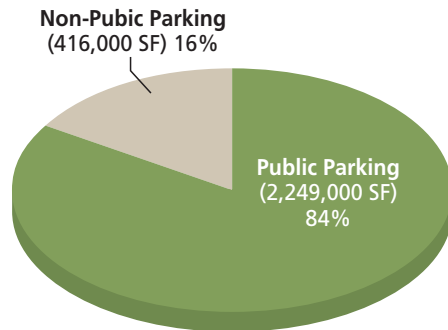
**TOTAL LANE MILES = 220**



Ninety-nine percent of roadway pavement classified as Principal Park Road (Class 1) or Connector Park Road (Class 2) within the park is rated as good (63%) or fair (36%). One percent of the Class 1 or Class 2 roadways have an average condition of poor. The pavement conditions of Grand Teton National Park have the fourth highest average PCR of all IMR focus parks based on Cycle 4 or 5 data.

## PARKING ASSETS

**TOTAL SQUARE FEET = 2,665,000**



Approximately 84 percent of the parking facilities are classified as public; while the remaining 16 percent make up non-public parking. Park-wide there are approximately 3,685 public parking spaces and 685 non-public parking spaces.

## PARKING PAVEMENT CONDITION RATING (PCR)

Parking Type	Average PCR*
Public Parking	64 - FAIR
Non-Public Parking	68 - FAIR
All Parking	65 - FAIR

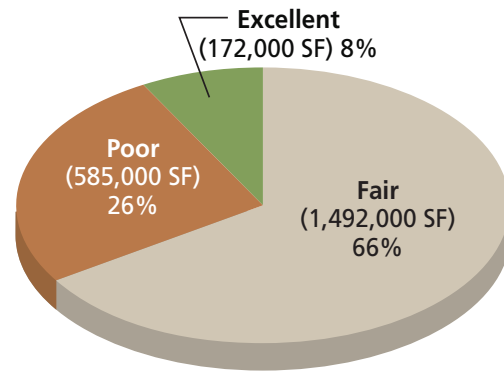
\*Cycle 4 RIP data

Parking assets are currently rated in worse condition than roadway assets. The average PCR for parking is fair conditions compared to a fair to good average condition for roadways.

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

The average PCR for public parking assets is fair. Ninety-two percent of public parking areas are in fair or poor condition. Park-wide, public parking areas provide approximately 280 spaces (172,000 square feet) in excellent condition and 2,445 spaces (1,492,000 square feet) in fair condition. The remaining 960 spaces (585,000 square feet) are in poor condition.

**TOTAL SQUARE FEET = 2,249,000**



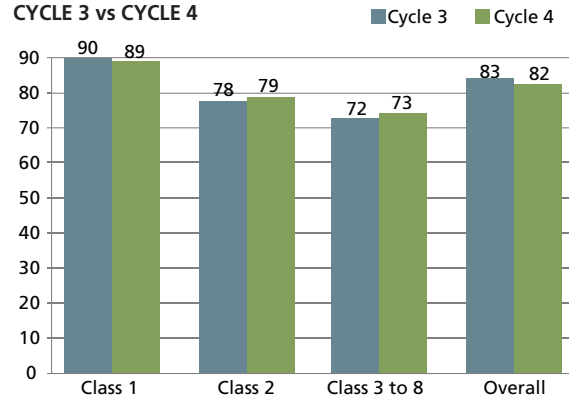
## ASSET CONDITIONS OVER TIME

The most recent cycle of RIP data available for Grand Teton roadways and parking is Cycle 4. A comparison of Cycle 3 and Cycle 4 asset data provides a snapshot of the conditions of Grand Teton National Park assets over time. Between 2006 and 2012 the average roadway pavement conditions within the park degraded slightly from 83 to 82. The average parking pavement conditions also degraded from 82 to 65.

### ROADWAY ASSETS

Average pavement conditions degraded slightly for Class 1 roadways and for the Park overall. Class 2 through 8 roadways experienced a slight improvement. All roadway classifications have an average pavement condition of fair in Cycle 4.

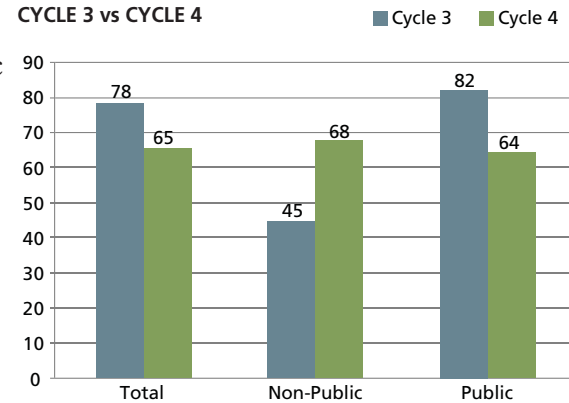
#### ROADWAY CONDITIONS CYCLE 3 vs CYCLE 4



### PARKING ASSETS

Average pavement conditions degraded for public parking areas but improved for non-public areas. The average condition for Cycle 4 is fair but approaching poor.

#### PARKING CONDITIONS CYCLE 3 vs CYCLE 4





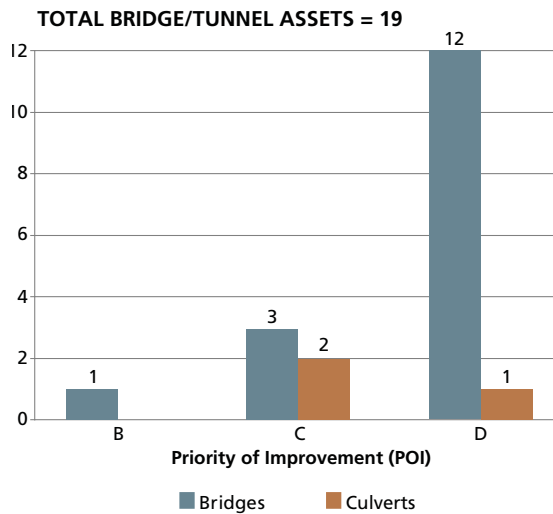
## TRANSPORTATION TRAILS

The Park contains one transportation trail meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities." The multi-use Pathway connects the park entrance to Jenny Lake. Hikers as well as bicycles are allowed to use the trail. The pathway was completed in 2009; additional pathways are planned for the park.

- Condition - Good
- Deferred Maintenance - \$213,300
- Current Replacement Value - \$13,853,446

## BRIDGE AND TUNNEL ASSETS

### Bridge and Tunnel Asset Quantity and Condition

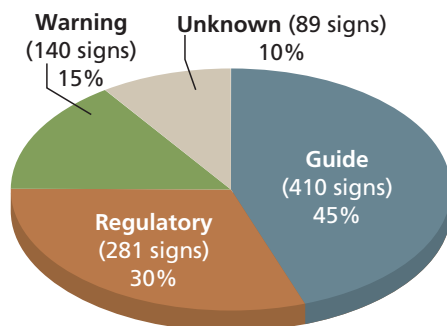


Grand Teton National Park maintains 16 bridge and 3 culverts. One bridge has a POI of B indicating potential near term maintenance needs, the remaining bridges and all culverts are sound and do not have immediate maintenance needs.

GRTE

## TRANSPORTATION SIGN ASSETS

### Sign Asset Quantity and Condition



Grand Teton National Park roadways and parking areas contain 920 transportation signs. Approximately 45% of the signs are guide signs meant to direct visitors to the desired destinations. Forty-five percent of the signs are regulatory and warning signs. The remaining 10% (89 signs) have unknown types since the signs are either missing or unreadable.

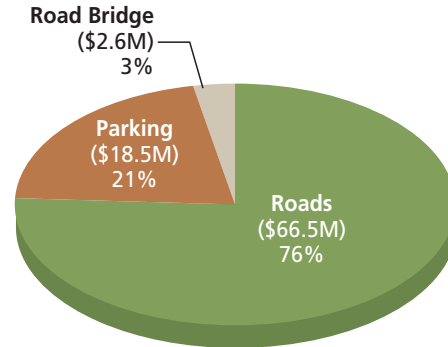
Condition	Quantity
Good	900
Fair	2
Poor	18

## DEFERRED ASSET MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Deferred maintenance within Grand Teton National Park totals \$87.6 million.
- Over three-quarters of deferred maintenance is associated with park roadways (76%).
- Roadways and parking constitute approximately 97 percent of the park's total deferred maintenance for transportation assets.

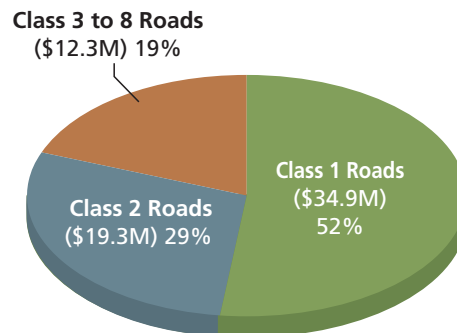
**TOTAL DEFERRED MAINTENANCE = \$87.6M**



## DEFERRED ROADWAY MAINTENANCE

- Roadway maintenance within Grand Teton National Park totals \$66.5 million
- Fifty-two percent of roadway deferred maintenance in Grand Teton National Park is associated with Class 1 roadways.
- Roadway deferred maintenance is in direct proportion with the breakdown of roadway classification within the park.

**TOTAL DEFERRED MAINTENANCE = \$66.5M**



## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks, and in Grand Teton National Park, has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. In Grand Teton National Park, this system includes multimodal facilities that enable visitors to get around. These facilities include boats, multi-use paths, trails and a commercial airport. Not all facilities that serve to connect the region and the nation to the park are owned or operated by NPS. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Some pieces of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

### .....ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

Alternative transportation systems is a term applied to NPS transit operations such as shuttle buses, or in the case of Grand Teton National Park, shuttle boats. Jenny Lake Boating offers shuttle services across Jenny Lake from the Jenny Lake Visitor Center to the base of Mount Teewinot, the mouth of Cascade Canyon. The shuttle service operates from mid-May through September. The service is provided for a fee in addition to the park entrance fee. The shuttles operate every 15 to 20 minutes throughout the day.

### .....JACKSON HOLE AIRPORT (JAC)

Initial construction of an airstrip seven miles north of the town of Jackson was completed in the 1930s. When Jackson Hole National Monument was designated in 1943, the airport was included. After the monument and park were combined in 1950, the Jackson Hole Airport became the only commercial airport within a U.S. National Park.

Operated by the Town of Jackson, the airport has one asphalt-paved runway, 6300-feet long and 150-feet wide. Five commercial airlines (American, Delta, Frontier, Skywest, United) provide service at Jackson Hole Airport with direct flights from major cities such as Denver, Salt Lake City, Dallas/Fort Worth, Minneapolis, Chicago, Atlanta and Los Angeles. The largest aircraft that is currently served at the airport is a Boeing 757, which can accommodate up to 289 passengers. The airport serves approximately 85 operations per day, 22 percent of which are commercial flights. The airport served over 300,000 passengers in 2008.

Jackson Hole Airport has some of the strictest noise abatement regulations of any airport in the U.S. The airport operates under the “Jackson Hole Airport Noise Abatement Plan” which requires continued monitoring and updating to utilize newer and quieter technologies to minimize impact to Grand Teton National Park. Additionally, the airport has night flight curfews and overflight restrictions, with pilots being expected to approach and depart the airport along the east, south or southwest flight corridors. Through the noise abatement plan, Jackson Hole Airport has experienced the greatest noise reduction of any airport in the United States.

### .....TRANSPORTATION TRAIL

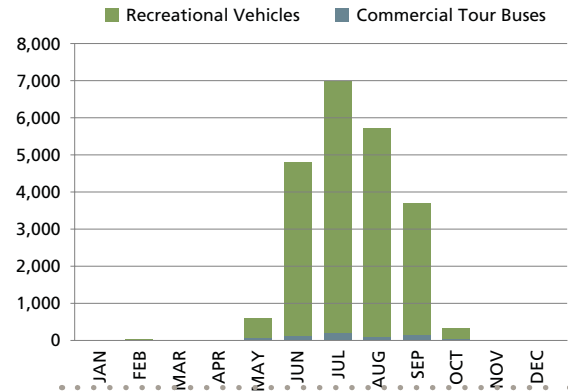
Grand Teton National Park provides a paved, multi-use Transportation Trail from Jackson to Jenny Lake. Hikers, bicycles, and other non-motorized users are allowed on the trail. Other than guide dogs for aiding a person with a physical disability, pets are not permitted on the multi-use pathway.

## CONGESTION

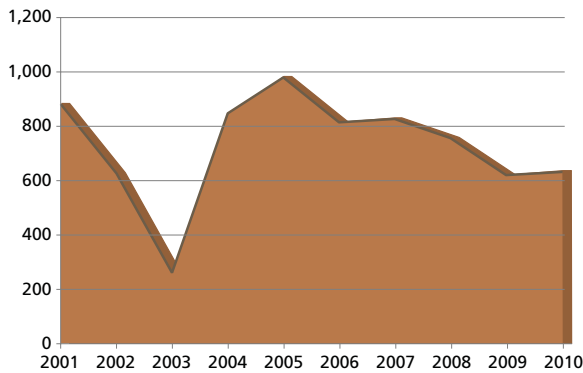
The number of vehicles entering Grand Teton National Park increased from 2002 to 2010. The peak visitation month in 2010 was July. Grand Teton National Park welcomes approximately 8,930 vehicles on a peak visitation day.

During peak season, over 5,000 commercial tour buses and RVs visit Grand Teton National Park in a month. The number of RVs greatly outnumbers the volume of commercial tour buses.

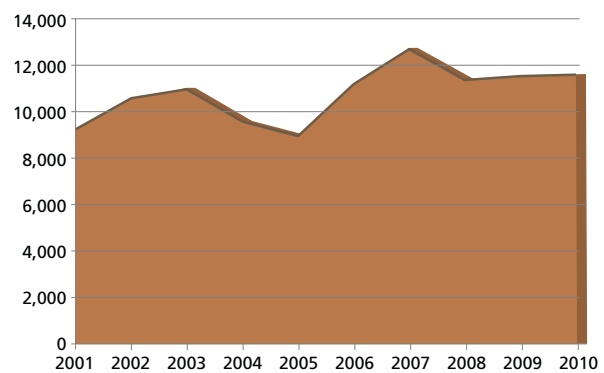
Commercial Tour Bus and RV Vehicles



Annual Commercial Tour Bus Volumes



Annual RV Overnights



The annual number of commercial tour buses visiting Grand Teton National Park has decreased since 2005. Based on volumes reported by the park, the number of commercial tour buses entering Grand Teton National Park is very low compared to other parks of comparable size and visitation. The number of RVs entering the park also appears to be increasing based on the number of overnight RV stays in the park.

## CONGESTED LOCATIONS

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff did not provide responses to identify congested areas within the park.

## CONGESTION MITIGATION STRATEGIES

Park staff did not identify congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey.

## ITS STRATEGIES

Park staff did not identify ITS congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey.

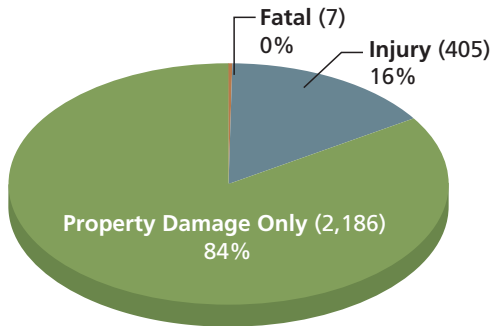
GRTE's electronic brochures and podcasts offer visitors a virtual trip through the park's features and attractions to aid in trip planning. The *2011 Update on ITS in NPS* report by The Volpe Center reported the following ITS strategies in use by Grand Teton National Park.

Dynamic Mes-sage Signs (portable and permanent)	511 System Integration	Loop Detectors/Traffic Counters	Road Surveillance	Coordinate with Other Agencies	ITS Needs Assessment/ITS Architecture (year)
x	x	x	x	x	x

*2011 Update on ITS in NPS, Volpe Center*

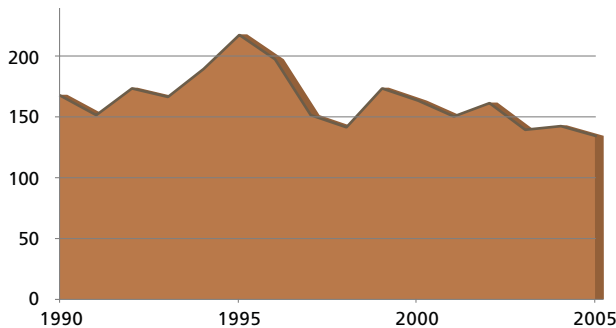
## CRASH SEVERITY

**TOTAL CRASHES = 2,598**



Grand Teton National Park experienced 2598 crashes between 1990 and 2005. Seven of these crashes included a fatality and 405 included at least one injury. The majority (84%) were property damage only.

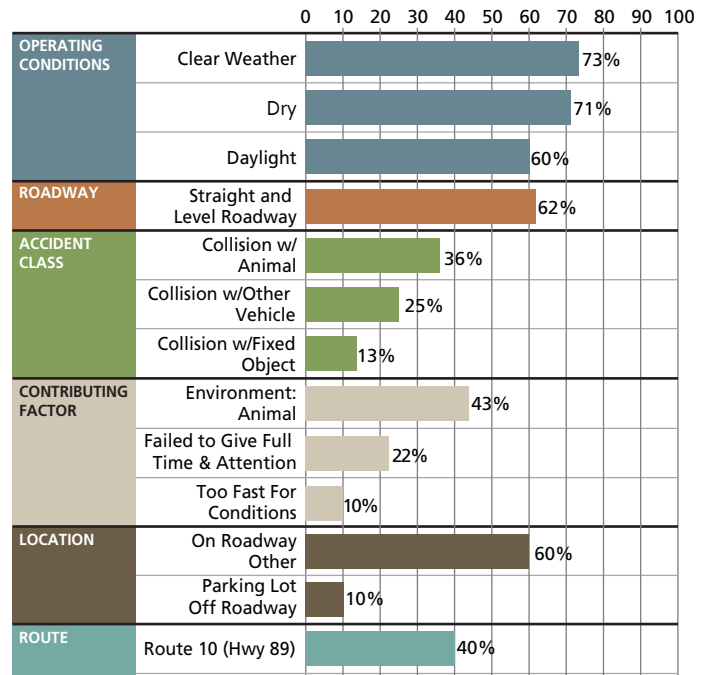
## ANNUAL CRASHES



Grand Teton National Park averages approximately 162 crashes each year. The park has experienced an annual decline in crashes of approximately 1.6 percent per year since 1990. The crash rates within Grand Teton National Park are not identified as higher than expected based on State of Wyoming crash experience.

## CRASH CONDITIONS (1990-2005)

A majority of crashes in Grand Teton National Park occur during daylight and dry conditions. Collisions with animals and with other vehicles account for 61 percent of crashes. About 60 percent of crashes occur on Highway 89, which traverses the edge of the park. The high speeds on Highway 89 and the frequency of wildlife likely contribute to the number of animal/vehicle crashes which account for 36 percent of park crashes.



## VISITOR EXPERIENCE

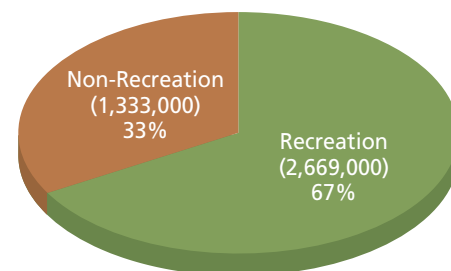
The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information NPS collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Grand Teton National Park. With close to 2.7 million visitors annually to Jackson Hole, NPS is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park. GRTE's podcasts and online brochures make it easier to plan a trip and spend time in meaningful ways, whether floating on the Snake River, hiking the Teton Range, boating on a lake or relaxing at Jackson Lake Lodge.

## 2010 VISITATION

Grand Teton National Park had approximately 2,669,000 recreational visitors in 2010. About 33 percent of park traffic is non-recreational. Most non-recreation trips are from through traffic on US Highway 26/89/191/287 which traverses the eastern portions of the park.

### 2010 Visitation

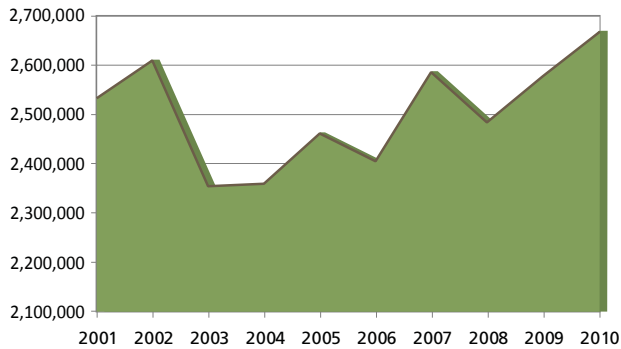
**TOTAL VISITORS = 4,002,000**





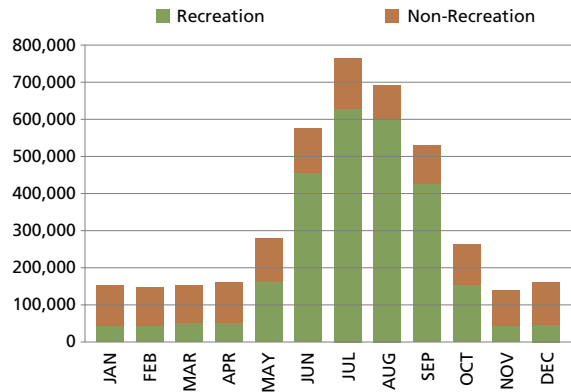
## ANNUAL VISITATION

### Recreation Visitation 2001-2010

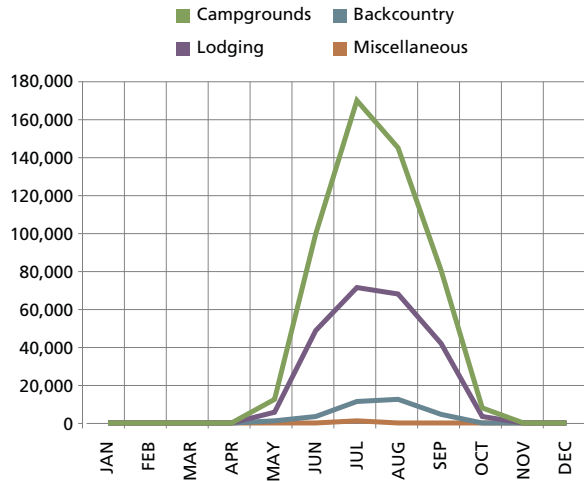


- Visitation steadily increased by about 0.20 percent per year since 2003.
- Non-recreation trips have been decreasing by about 0.1 percent per year.
- In 2008, 90 percent of visitors were from the U.S., and 60 percent were visiting Grand Teton National Park for the first time.
- Peak visitation months are June through September – accounting for 60 percent of annual visits
- Lodges and campgrounds account for over 160,000 overnight stays in July

### Visitors By Month



### Overnight Stays By Month

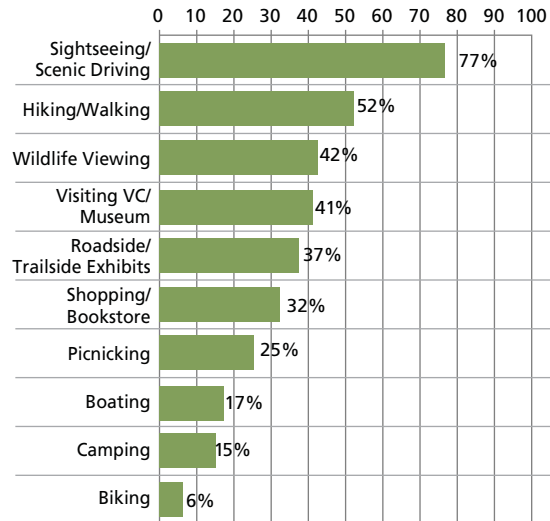


GRTE

## VISITOR ACTIVITIES

A majority of visitors participate in two primary activities, Sightseeing/scenic driving and walking/hiking. Both of these activities rely on the transportation system provided within the park. Wildlife viewing, roadside/trailside exhibits, picnicking, and boating are also popular activities.

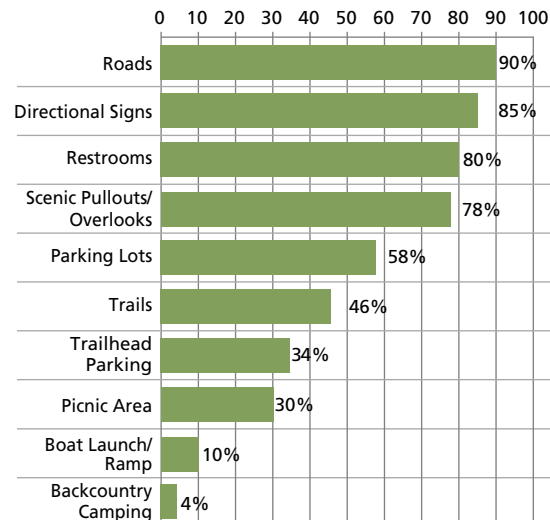
The concessionaires serving Grand Teton National Park provide many organized activities for park guests. These activities include backpacking, boat rentals, rock climbing, cross country skiing and snowshoeing, fishing, float trips, horseback riding, kayaking, and lake cruises; all of which showcase the natural setting that distinguishes Grand Teton National Park.



## VISITOR SERVICES USED

Most park visitors (89%) obtain park information prior to their visit. In fact, brochures and several podcasts are available for download from the Internet. They describe various aspects of the park, including an overview of park history and geology, viewpoints, hiking trails, boating opportunities, and wildlife.

Surveys have indicated less than one in four visitors uses boat launches and backcountry camping location. Most visitors use facilities associated with scenic driving; roads, directional signs and restrooms.



## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP, 2008, state detractions/negative visitor comments: crowded parking at Jenny Lake, crowded boat launch at String Lake
- 2010 CMS Survey – did not participate
- Surveys & Interviews, 2011
  - Congested locations: highly popular visitor use areas during peak season, parking areas, gateway community of Jackson
  - Strategies: signage, restriped parking lots, park website and social media, multi-use pathways

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in Grand Teton National Park.

### AIR QUALITY AND GHG EMISSIONS

#### Mobile GHG Emissions

Park Operations (MTCO <sub>2</sub> E)	788.9
Visitors (MTCO <sub>2</sub> E)	22,400.7
Concessionaires (MTCO <sub>2</sub> E)	3.0
Total Mobile GHG Emissions	22,403.7

*Climate Leadership In Parks*

The Park had completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

### SIGNIFICANT RESOURCES

The purpose of Grand Teton National Park is to protect the area's native plant and animal life, its cultural and historic resources, and its spectacular scenic values, as characterized by the geologic features of the Teton Range and Jackson Hole. The primary significance of Grand Teton National Park can be summarized as:

- The Teton Range as an example of fault-block mountains
- The Snake River as habitat for the cutthroat trout and as a recreational resource
- Healthy resources (extensive mammal, plant and bird species)

### HISTORIC ROADS

Nine percent of the road system is designated as historic, primarily in the Jackson Lake Lodge Loop and main parking area.

### THREATENED AND ENDANGERED SPECIES

Common Name	Species Name	Listing Category	Status in Park
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Delisted Monitored	Current
Brown Bear	<i>Ursus arctos</i>	Threatened	Current
Canada Lynx	<i>Lynx canadensis</i>	Threatened	Current
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Delisted Monitored	Current
Gray Wolf	<i>Canis lupus</i>	Experimental	Restored

There are no plant species currently listed as threatened or endangered, nor are there candidates for threatened or endangered status.

GRAND TETON TRANSPORTATION HIGHLIGHT

Grand Teton National Park is the only national park with a commercial airport located within its boundary. Jackson Hole Airport is located in the southern portion of the park. In order to preserve the scenic resources and serenity of the park, the airport has adopted a noise abatement program to reduce noise levels at the airport.

All aircraft operating at Jackson Hole Airport must be Stage III certified, ensuring reduced engine noise levels. Operations to and from the south are highly recommended to avoid flights over the national park. Decibel levels are restricted to 92dBa or lower. Any flights over Grand Teton National Park are highly restricted with very specific flight paths in place. The airport also has a voluntary noise curfew from 11:30PM to 6AM daily. Pilots are encouraged to comply with the curfew with the exception of emergencies. These noise abatement procedures have helped Jackson Hole Airport experience the largest noise reductions of any airport in the US.

SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Grand Teton National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

REGIONAL AND COMMUNITY STAKEHOLDERS.....

Grand Teton National Park is surrounded by National Forest managed lands, Targhee and Teton National Forests. Yellowstone National Park and John D. Rockefeller, JR. National Memorial Parkway are to the north. The Bureau of Reclamation operated Jackson Lake which lies entirely within the park. The National Elk Refuge, managed by the BLM, lies adjacent to the park and the town of Jackson. Jackson, WY is the park’s gateway community, directly south of the park.

Regional Communities	• Jackson, WY
US Forest Service	• Teton National Forest • Bridger National Forest • Targhee National Forest
US Bureau of Reclamation	• Jackson Lake
US Bureau of Land Management	• National Elk Refuge
Wyoming DOT (WYDOT)	• US 26 • US 89 • US 191 • US 287 • SH 22

..... **TRANSPORTATION RELATED PARTNERSHIPS**

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

**Existing Partnerships**

Community Partnerships	<ul style="list-style-type: none"> <li>• Good coordination with Jackson and Teton County.</li> <li>• When the park does receive funding, there are restrictions that often don't allow the park to use the money to the greatest benefit.</li> <li>• Park uses concession-operated transit due to difficulties in securing NPS funded operations and maintenance funds.</li> </ul>
The Grand Teton National Park Foundation	The Grand Teton National Park Foundation raised private funds to help fund the Craig Thomas Discovery and Visitor Center in Moose and to fully fund the auditorium. The visitor center, a public-private partnership project, opened to the public August, 2007 and the auditorium in 2011. The Foundation supports a variety of other important projects that contribute to the protection of park resources.
The Grand Teton Association	The Grand Teton Association is a not-for-profit park partner dedicated to supporting the interpretive, scientific and educational activities of Grand Teton National Park.
The Murie Center	The Murie Center, in partnership with Grand Teton National Park, engages people to understand and commit to the enduring value of conserving wildlife and wild places.
Jackson Hole Wildlife Foundation	Jackson Hole Wildlife Foundation is working to promote ways for the community to live compatibly with wildlife.
University of Wyoming NPS Research Station	The primary function of the Research Station is to promote excellence in research by furnishing housing, laboratory space, transportation, equipment and financial support to enable investigators in the biological, physical and social sciences to access the rich and diverse environments of Grand Teton and Yellowstone National Parks, Bridger-Teton and Targhee National Forest and the Gros Vente and Teton Wilderness Areas.
Other	<ul style="list-style-type: none"> <li>• National Trust for Historic Preservation</li> <li>• Jenny Lake Rangers Fund</li> <li>• Rockefeller Senior Associates</li> <li>• Teton Science Schools</li> <li>• U.S. Forest Service</li> <li>• National Elk Refuge</li> <li>• Interagency Grizzly Bear Team</li> <li>• Greater Yellowstone Coordinating Committee</li> <li>• Town of Jackson</li> <li>• Teton County, WY</li> <li>• State of Wyoming</li> </ul>

## CLIMATE FRIENDLY PARKS ·····

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Grand Teton National Park is in the CFP certification process.

## PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS ·····

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

### VISITOR EXPERIENCE

- Congestion, Capacity, and Parking
  - There is an emphasis to change parking locations and spaces to match the carrying capacity of the adjacent area.
- ATS
  - Transit – small – localized systems run by concessionaires/other parties.
  - The Pathway project will increase connectivity to a larger regional trail network. The improved multiuse trails are anticipated to provide better bicyclist access from Jackson, cutting down the number of people who drive in with bicycles atop car, then park and ride in the area.

### RESOURCE PROTECTION

- Resources at Risk
  - The roadway assets, specifically roadway side slopes near river banks, are eroding faster than they can be maintained.
  - Wildlife mortality has been somewhat reduced through mitigation measures, but still a problem, especially on the outside highway. Affects wildlife viewing opportunities, one of the major park activities.
  - There are conflicting agendas regarding roadway improvements and resource protection.
  - Invasive species common along park roads.
  - Planning in progress to relocate the north end of Moose-Wilson Road out of a very sensitive wetland that provides critical habitat for numerous "charismatic mega-fauna," causing impacts to wildlife and wetlands, along with unsafe conditions for travelers and visitors.

### SUSTAINABLE OPERATIONS

- Climate Change
  - Reported increased precipitation later in the spring season in the form of heavier, wetter snow, contributing to high runoff in the early summer, sometimes overwhelming culverts, bridges and roads.



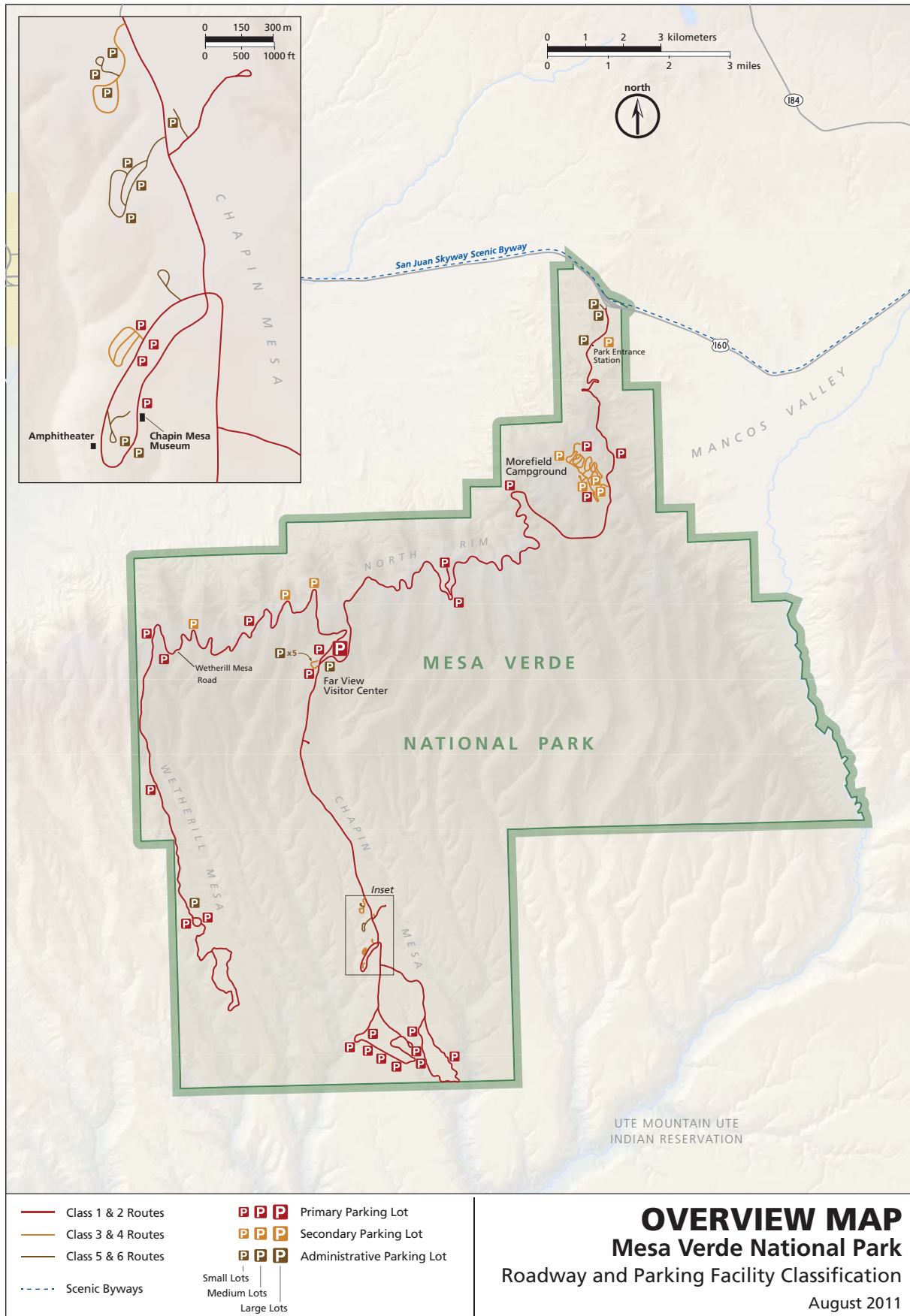
# Mesa Verde National Park

(MEVE)



MEVE

INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT





# MESA VERDE NATIONAL PARK (MEVE)

## AT A GLANCE

**STATE:** Colorado **SIZE:** 82 square miles **TYPE:** Rural

### ROADWAY/PARKING CONDITION (CYCLE 4)

	PCR	DM	Lane Miles	Area/Spaces
Roadways	81 / FAIR	\$19.2 Million	93	–
Parking	73 / FAIR	\$4.9 Million	–	1,164,000 SF / 1,910
Replacement Value of All Transportation Assets			\$249.6 Million	

Asset Management

### CONGESTED AREAS

- Shuttle capacity
- Limited access concentrates visitors at a few sites

### ALTERNATIVE TRANSPORTATION SYSTEM

Annual Boardings	43,000
Fuel Type	Propane

### FEES

Transportation Fee	Tour fees apply
FLREA (% retention)	80%

Mobility, Access, & Connectivity

### 2010 VISITATION (2010)

Total Visitors	567,000
Non-Recreation Visitors	7,000
Recreation Visitors	560,000
10-Year Trend	+5.4%

### VISITOR EXPERIENCE QUALITY SCORE

Roads	Parking	Date
–	–	to be published in 2013

(University of Idaho Survey)

### TOP ACTIVITIES

- Historical & Geological
- Interpretation/Photography

Visitor Experience

### AT-RISK RESOURCES

- Cultural Resources
- Wildlife
- Fire & human impacted soils
- Air Quality
- Invasive Species

### TRANSPORTATION/RESOURCE ISSUES

- Wildlife/vehicle crashes
- Visitor Distribution and Transportation Plan

Air Quality Status	Not Monitored/Regulated
--------------------	-------------------------

Resource Protection

### KEY PARTNERS

- Mesa Verde Foundation
- Southern Colorado Clean Cities Coalition
- CDOT/Region 5

Climate Friendly Park Status	GHG Baseline
Green House Gas Emissions	5,329 Metric Tons (CLIP)

Sustainable Operations

MEVE

### Key Transportation Findings and Challenges

<b>Asset Management</b>	80% of Class 1 & 2 roadway lane miles are in Good condition. Overall roadway PCR improved from 44 (Cycle 3) to 81 (Cycle 4).
	58% of public parking areas are in Poor or Fair condition.
	\$26.7 million in Deferred Maintenance of transportation assets, about 3% of total IMR DM.
<b>Mobility, Access, &amp; Connectivity</b>	The shuttle system, required for access to some sites, is crowded during peak season. Long term operational costs for the shuttle system must be balanced with fiscal sustainability goals.
	Crowding at popular sites is leading the Park to consider opening access to previously undeveloped sites. The trade-offs in visitor access and resource protection at delicate cultural sites must be carefully examined and balanced.
	While the park encourages bicycling, cyclists must co-exist on the narrow roads and at the tunnel with motorized vehicles.
<b>Visitor Experience</b>	2010 Recreation Visitation 559,712 (Medium).
	Recreational visitation grew 1.0% annually 2001-2010.
	Visitors are concentrated are relatively few sites. Many sites are not open to the public, prompting park staff to begin planning for a more equal distribution of visitors throughout the park.
<b>Resource Protection</b>	Priority to complete Visitor Distribution and Transportation Plan.
	21% of roadway lane miles and 18% of parking areas are designated as historic.
	The park is especially vigilant in managing transportation so as to not unnecessarily impact cultural resources by over-visitation. Need to carefully identify connection between transportation facilities and erosion/degradation of cultural/historic resources.
	The increasing population of feral horses and other wildlife are at risk of vehicle/animal collisions.
<b>Sustainable Operations</b>	Park is working with external agencies to develop its regional shuttle system.
	Conversion of diesel fleet to alternative fuel (B20). Working to replace other vehicles with electric/hybrid using renewable sources.

## MISSION

The mission and purpose of Mesa Verde National Park is to preserve and protect from injury and spoliation sites, artifacts and other works of Ancestral Puebloan peoples; protect wildlife, birds, and other natural resources from willful destruction, disturbance and removal; manage and protect the pristine character of designated wilderness on 8,100 acres; provide for research to increase knowledge and aid in the advancement of archeological science; maintain American Indian rights, annuities and benefits that are entitled by law, treaty and executive orders; and protect the scenery of Point Lookout.

## PARK DESCRIPTION

Mesa Verde National Park is 82 square miles in size and was established in 1906. The park is a UNESCO World Heritage Site and was established to protect some of the best preserved cliff dwellings in the world. It was the first national park established to preserve cultural resources. Mesa Verde National Park, Spanish for green table, provides a look into the lives of the Ancestral Pueblo people who lived in the area for over 700 years from A.D. 600 to A.D. 1300. The remnants of their ancient settlements include over 4,000 known archeological sites, including 600 cliff dwellings.

The dwellings of Mesa Verde National Park comprise both mesa top dwellings and cliff dwellings. The mesa top dwellings are located on Chapin Mesa and Wetherill Mesa. The most notable features of Mesa Verde National Park are the cliff dwellings. Locations of cliff dwellings around the park

Park Website: [www.nps.gov/meve](http://www.nps.gov/meve)

include Balcony House, Cliff Palace, Long House, Spruce Tree House, and Step House. Many of the backcountry cliff dwellings have not been visited or documented by archeologists since they were first recorded during park surveys in the 1930s, 1950s and 1970s. In 1994, park management developed the Archeological Site Conservation Program, the goal of which is to assess the condition of 600 alcove sites, document those that contain intact architecture, and stabilize some of the more severely threatened sites.

## **PARK LOCATION**

Mesa Verde National Park is located in southwestern Colorado in the four corners region of Colorado, Utah, New Mexico, and Arizona. The park is 45 miles from Durango, CO; 225 miles from Grand Junction, CO; 290 miles from Flagstaff, AZ; 260 miles from Albuquerque, NM; and 380 miles from Denver, CO.

Nearby National Park Service units include:

- Yucca House National Monument (35 miles)
- Hovenweep National Monument (65 miles)
- Aztec Ruins National Monument (80 miles)
- Great Sand Dunes National Park (160 miles)

## **TRANSPORTATION OVERVIEW**

Mesa Verde National Park provides 93 lane miles of roadway and 1,164,000 square feet (1910 spaces) of parking infrastructure. There are two primary roads within the park. Chapin Mesa Road is open year round and serves the most popular attractions within the park. The route is a steep, narrow, winding mountain road. Trailers and towed vehicles are not permitted beyond Morefield Campground. Wetherill Mesa Road is typically open from Memorial Day to Labor Day. The road has vehicle restrictions of no more than 8,000 pounds or 25 feet in length. In recent years, the road has been opened to hikers and bikers after Labor Day to encourage multi-modal use in this area of the park.

A free, accessible tram circulates from the end of Wetherill Mesa road through the Wetherill Mesa dwelling sites. This service operates when Wetherill Mesa Road is open. Durango-La Plata County Airport is approximately 60 miles east of the park, providing commercial air service to the southwestern portion of Colorado.

The Park has one entrance from US Highway 160 between Cortez, CO and Durango, CO. Regional highways that provide access to Mesa Verde National Park include Colorado State Highway 145 from the north, US Highway 160 from the east and west, and US Highway 491 from the northwest. Within the park, Chapin Mesa Road connects the park entrance with Morefield Campground, Far View Terrace, Chapin Mesa Museum, Mesa Top Loop and Cliff Palace Loop.

## ASSET MANAGEMENT

The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Mesa Verde National Park transportation assets is \$249.6 million.

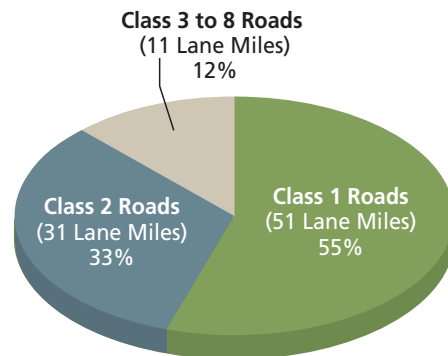
### Mesa Verde National Park Roadway and Parking Assets

- Approximately 93 lane miles of roadway network on 35 different routes.
- Approximately 1,164,000 square feet (1,910 spaces) of parking area provided in 62 identified parking areas.
- 82 lane miles are defined as Class 1 or 2 roads (88%)

### ROADWAY ASSETS

Class 1 & 2 roads comprise 88 percent of roadways in Mesa Verde National Park. The breakdown of roadway classifications within Mesa Verde National Park is very similar to the classification breakdown for the IMR as a whole.

TOTAL LANE MILES = 93



### ROADWAY PAVEMENT CONDITION RATING (PCR)

The Class 1 roads have an average PCR rating of good and the Class 2 roads have a fair rating. The remainder of roads is rated as poor condition. The overall average roadway condition in the park is fair.

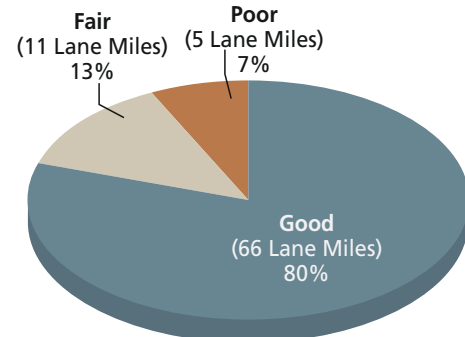
Roadway Type	Average PCR*
All Roadways	81 - FAIR
Class 1	87 - GOOD
Class 2	81 - FAIR
Class 3 to 8	55 - POOR

\*Cycle 4 RIP data

### CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

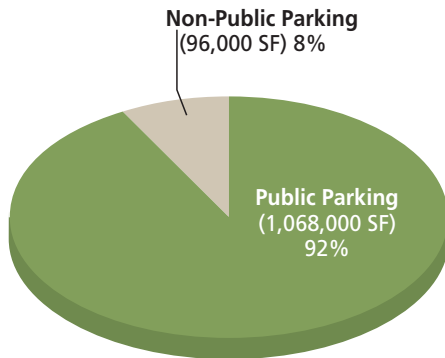
Eighty percent of roadway pavement classified as Principal Park Road (Class 1) or Connector Park Road (Class 2) is rated as good. Only seven percent is rated as poor.

TOTAL LANE MILES = 82



## PARKING ASSETS

TOTAL SQUARE FEET = 1,164,000



Approximately 92 percent of the parking facilities are classified as public; while the remaining 8 percent are classified as non-public. Park-wide there are approximately 1,750 public parking spaces and 160 non-public parking spaces.

## PARKING PAVEMENT CONDITION RATING (PCR)

Parking Type	Average PCR*
Public Parking	74 - FAIR
Non-Public Parking	57 - POOR
All Parking	73 - FAIR

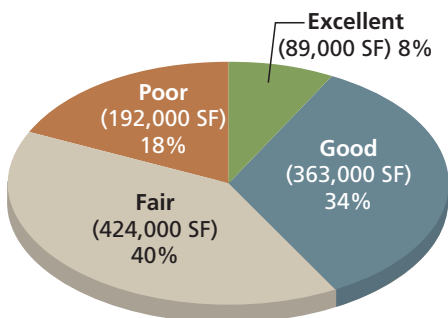
\*Cycle 4 RIP data

Parking assets are currently rated in worse condition than roadway assets. The average PCR for parking is fair conditions compared to a fair to good average condition for roadways.

MEVE

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

TOTAL SQUARE FEET = 1,068,000



The average PCR for public parking assets is fair. Over half of public parking areas are in fair or poor condition. Park-wide, public parking areas provide approximately 145 spaces (89,000 square feet) in excellent condition, 595 spaces (363,000 square feet) in good condition, and 695 spaces (424,000 square feet) in fair condition. The remaining 315 spaces (192,000 square feet) are in poor condition.



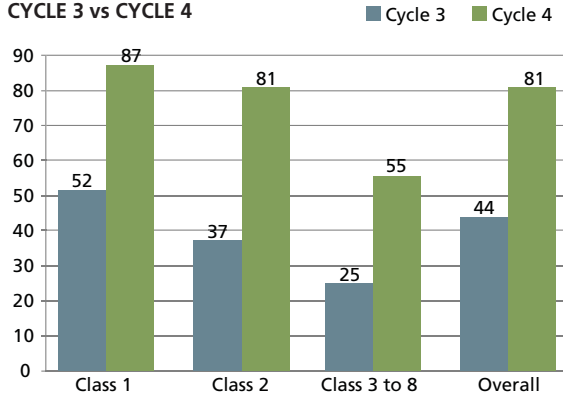
## ASSET CONDITIONS OVER TIME

The most recent cycle of RIP data available for Mesa Verde roadways and parking is Cycle 4. A comparison of Cycle 3 and Cycle 4 asset data provides a snapshot of the conditions of Mesa Verde National Park Assets over time. Between 2006 and 2012 the average roadway pavement conditions within the park improved from 44 to 81. The average parking pavement conditions improved from a PCR of 64 to 73.

### ROADWAY

Average pavement conditions have improved substantially for all roadway classifications. All classifications have improved from poor to fair condition. Class 1 roadways have improved to good condition.

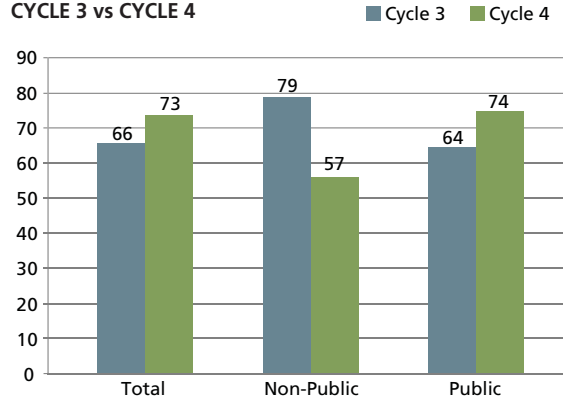
#### ROADWAY CONDITIONS CYCLE 3 vs CYCLE 4



### PARKING

Public parking areas have improved in average condition. Non-public areas have degraded in average condition to poor. Overall, parking areas are in fair condition.

#### PARKING CONDITIONS CYCLE 3 vs CYCLE 4

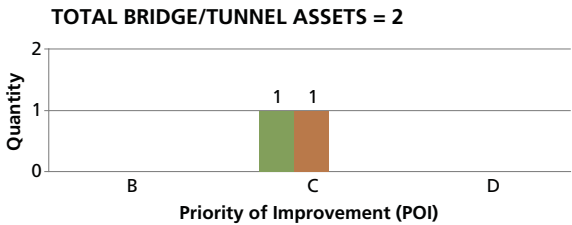


TRANSPORTATION TRAILS

The Park contains does not contain any transportation trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities."

BRIDGE AND TUNNEL ASSETS

Bridge and Tunnel Assets

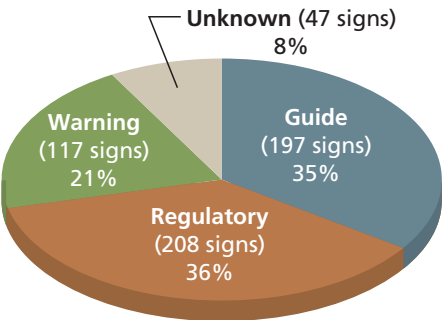


Mesa Verde National Park maintains one tunnel and one other structure. Each asset has a POI of C, indicating neither has immediate maintenance needs.

TRANSPORTATION SIGN ASSETS

Sign Asset Quantity and Condition

TOTAL SIGNS = 569



Mesa Verde National Park roadways and parking areas contain 569 transportation signs. Approximately 35 percent of the signs are guide signs meant to direct visitors to the desired destinations. Fifty-seven percent of the signs are regulatory and warning signs. The remaining 8 percent (47 signs) have unknown types since the signs are either missing or unreadable.

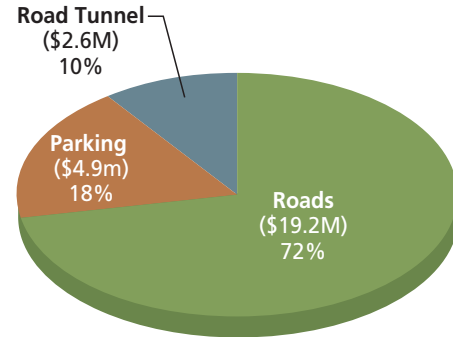
Condition	Quantity
Good	562
Fair	3
Poor	4

## DEFERRED ASSET MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Deferred maintenance within Mesa Verde National Park totals \$26.7 million.
- Nearly three-quarters of deferred maintenance is associated with park roadways (72%).
- The tunnel on Chapin Mesa Road accounts for approximately 10 percent of deferred maintenance.
- Previous Cycle 3 data included \$5.0 million of deferred maintenance for trails. Comparable trails data was not available for Cycle 4/5.

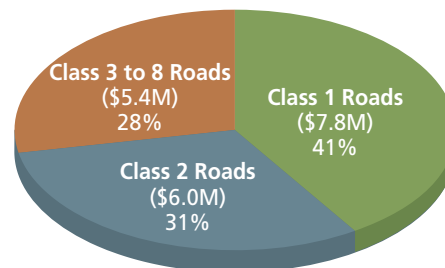
**TOTAL DEFERRED MAINTENANCE = \$26.7M**



## DEFERRED ROADWAY MAINTENANCE

- Roadway maintenance within Mesa Verde National Park totals \$19.2 million.
- Seventy-two percent of roadway deferred maintenance in Mesa Verde National Park is associated with Class 1 & 2 roadways.

**TOTAL DEFERRED MAINTENANCE = \$19.2M**



## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks, and in Mesa Verde National Park, has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. In Mesa Verde National Park, this system includes multimodal facilities that enable visitors to get around. These facilities trails and a circulator tram. Not all facilities that serve to connect the region and the nation to the park are owned or operated by NPS. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Some pieces of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

### .....ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

Alternative transportation systems is a term applied to NPS transit operations such as shuttle buses, or in the case of Mesa Verde National Park, a circulator tram. The tram operates on Wetherill Mesa from Memorial Day to Labor Day when Wetherill Road is open. The tram circulates visitors around the mesa top ruins as well as to the Long House cliff dwelling. The tram, which is free and ADA accessible, has a dedicated parking area at the end of Wetherill Mesa Road. No motorized vehicles are allowed in the area served by the tram, but walking is an accepted alternative. The tram serves over 32,000 boardings annually. The service operates for 850 service hours covering 8,200 miles. The tram service is seasonally congested at peak visitation times.

#### Mesa Verde ATS Summary \*

Annual Boardings	32,000 <sup>1</sup>
Service Hours	850 <sup>1</sup>
Service Miles	8,200 <sup>1</sup>
Quantity and Type	Three trams – power car and trailer, two operate per day <sup>2</sup>
Fuel	B20 biodiesel <sup>2</sup>
Operating Season and Schedule	Memorial Day to Labor Day, 10:00 am – 6:00 pm <sup>2</sup>
Operator	Concessionaire <sup>2</sup> (Aramark)
Options to using the ATS (Wetherill Mesa)	Walking <sup>2</sup>
* 2012 ATS Financial Analysis Phase II Report	

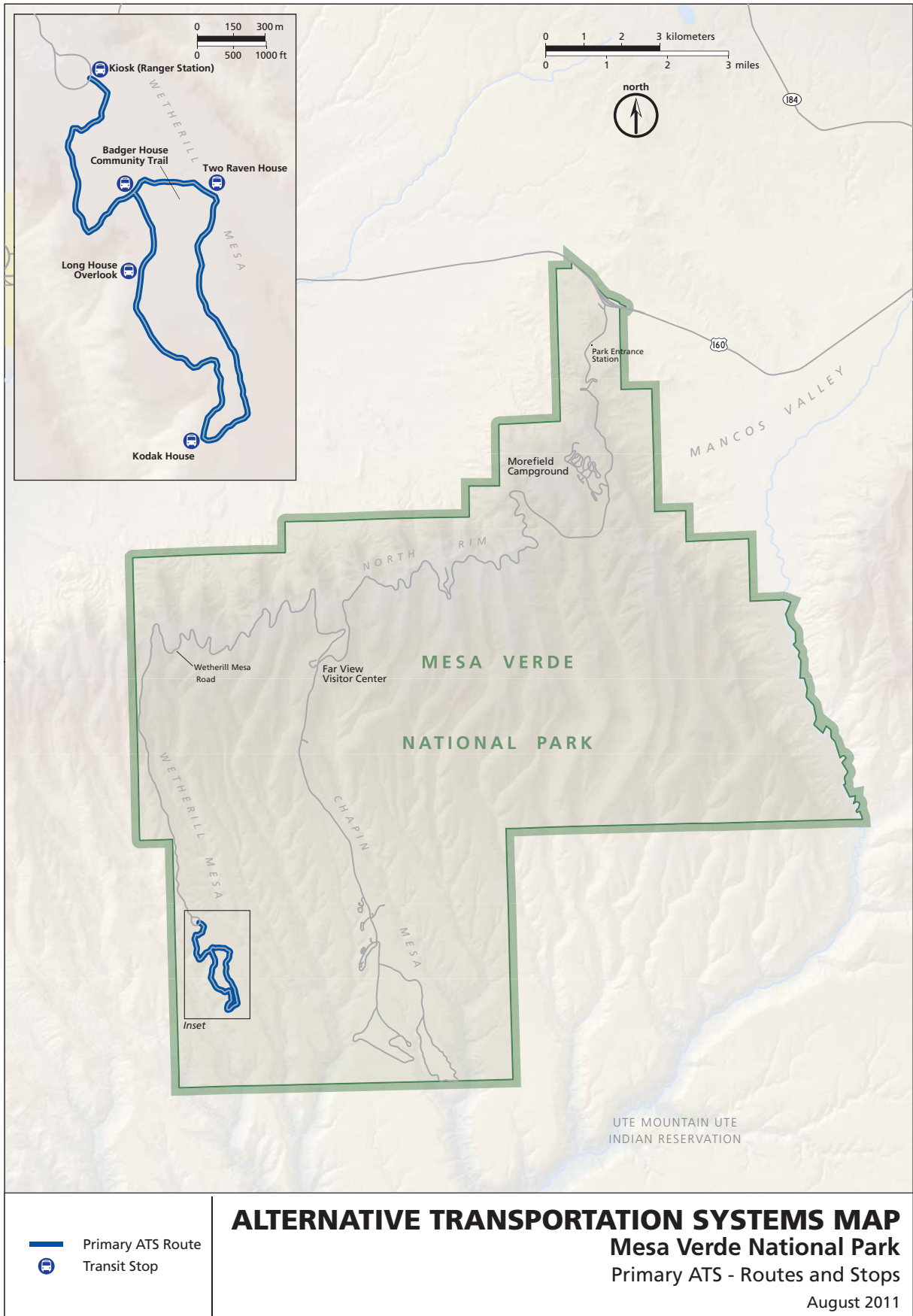
### .....MULTI-MODAL CONNECTIVITY

Bicycles are increasing in popularity at Mesa Verde National Park, but there are no bicycling facilities such as designated lanes or any type of alert system for the tunnel to alert motorists that a bicyclist is in the tunnel. The transit system at Wetherill Mesa is not bicycle accessible at this time. The Phil's World trail outside the park brings bicyclists to the park.

#### MESA VERDE NATIONAL PARK TRANSPORTATION HIGHLIGHT

In September 2010, Mesa Verde National Park began opening the Wetherill Mesa tram road to hikers and bicyclists on select weekends. Typically, the Wetherill Mesa area is closed after Labor Day. In an effort to endorse multi-modal use and allow visitors to experience the cooler temperatures and colors of the fall season, the tram road is opened from 9 am to 3:30 pm for visitation. The tram road is accessible at the Wetherill kiosk parking area at the end of Wetherill Mesa Road. Bike riding is not allowed on the Wetherill Mesa Road as it is too narrow for both vehicles and bike traffic. Entrance fees are waived for those who mention they are visiting to hike or bike the tram road.

INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT



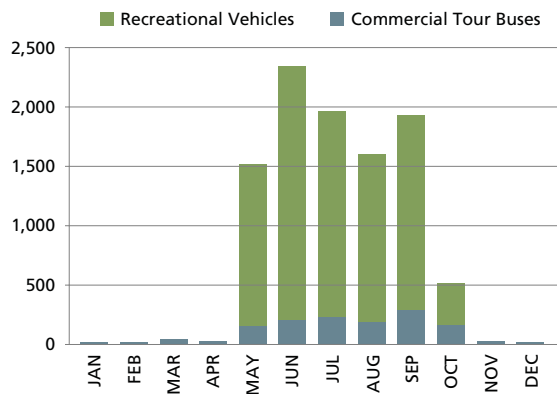
## SCENIC BYWAYS

HWY #		DESIGNATION	SCENIC BYWAY
SH 62	US 160	State, NSB, NFSB	San Juan Skyway
SH 145	US 550		
CO-SH 145	US 191	State, NSB, NFSB	Trail of the Ancients
CO-SH 184	UT-SH 95		
US 491	UT-SH 275		
CO-County Rd 10	UT-SH 261		
CO-SH 41	US 163		
UT-SH 262	UT-SH 162		
www.nps.gov			
NSB = National Scenic Byway, NFSB = National Forest Scenic Byway, State = State Scenic Byway			

Mesa Verde National Park is a destination on the Grand Circle (see page 46).

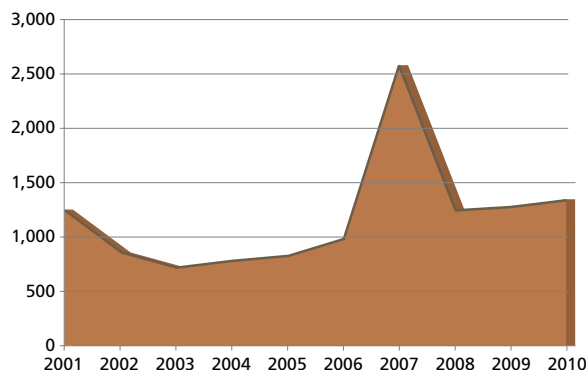
## CONGESTION

### Commercial Tour Bus and RV Vehicles

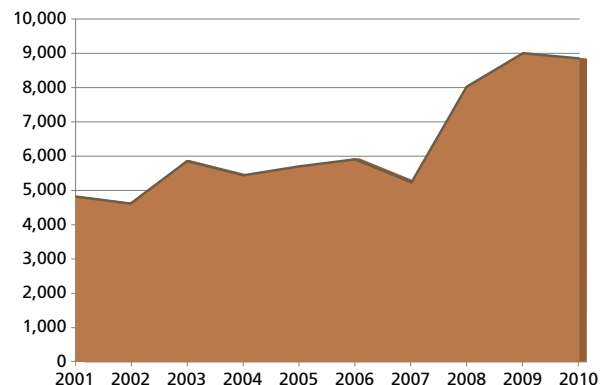


The number of vehicles entering Mesa Verde National Park increased from 2002 to 2010. The peak visitation month in 2010 was July. Mesa Verde National Park welcomes approximately 1,200 vehicles on a peak visitation day. During peak season, over 2,000 buses and RVs visit Mesa Verde National Park in a month. The number of RVs greatly outnumbers the volume of buses. The annual number of buses visiting Mesa Verde National Park has increased since 2003, with a jump in volume in 2007. The number of RVs entering the park also appears to be increasing based on the number of overnight RV stays in the park.

### Annual Commercial Tour Bus Volumes



### Annual RV Overnights





## CONGESTED LOCATIONS .....

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff did not provide responses to identify congested areas within the park.

## CONGESTION MITIGATION STRATEGIES .....

Park staff did not identify congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey.

## ITS STRATEGIES .....

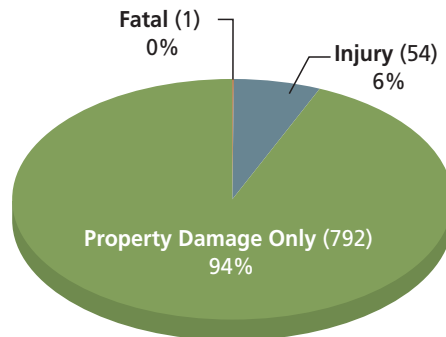
Park staff did not identify congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey.

Mesa Verde National Park's electronic brochures offer visitors a virtual trip through the park's features and attractions to aid in trip planning.

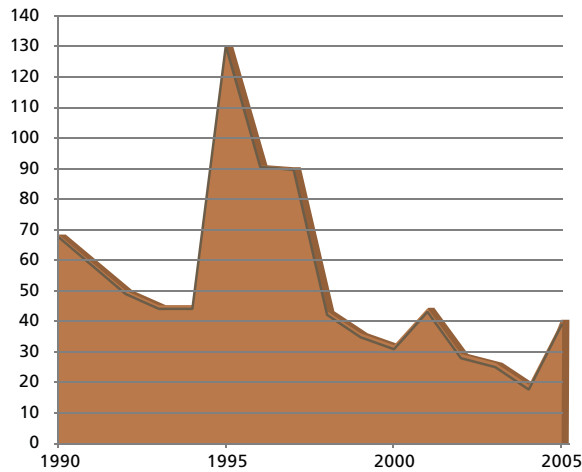
## CRASH SEVERITY .....

Mesa Verde National Park experienced 512 crashes between 1990 and 2005. One of these crashes included a fatality and 54 included at least one injury. The majority (94%) were property damage only.

**TOTAL CRASHES = 512**

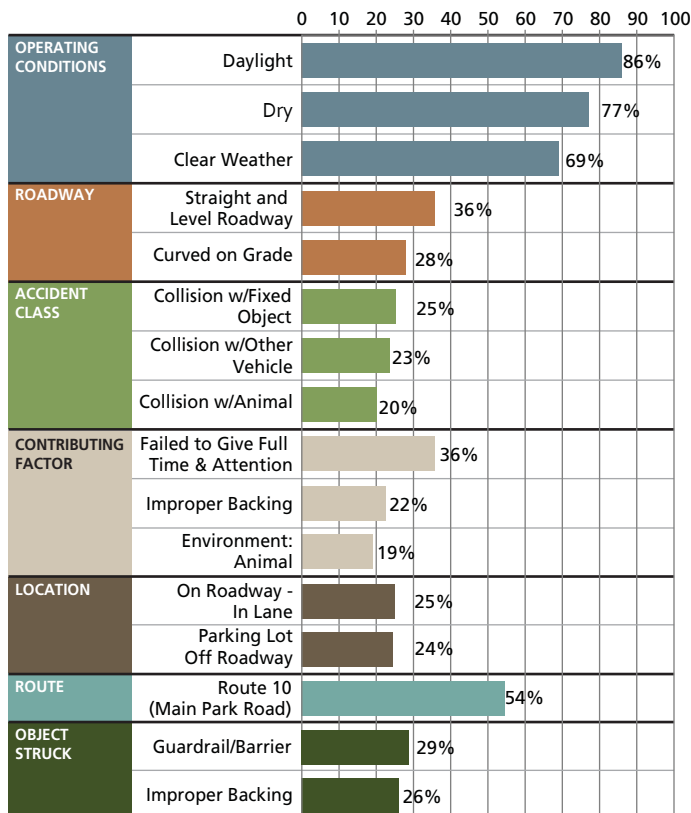


## ANNUAL CRASHES



Mesa Verde National Park averages approximately 53 crashes each year. The park has experienced an annual decline in crashes of approximately 8 percent per year since 1990. The crash rates within Mesa Verde National Park are not identified as higher than expected based on State of Colorado crash experience.

## CRASH CONDITIONS



A majority of crashes in Mesa Verde National Park occur during daylight and dry conditions. Collisions with fixed objects, other vehicles and animals account for 68 percent of crashes, while no individual accident classification accounts for more than 25 percent of crashes. About 54 percent of crashes occur on Chapin Mesa Road, which is the main park road. Over one-quarter of crashes occur on roadway curves and another quarter occur in parking lots.

## VISITOR EXPERIENCE

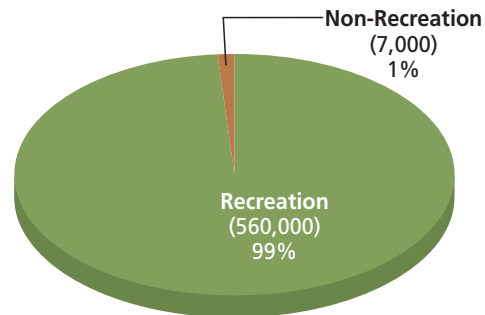
The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information NPS collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Mesa Verde National Park. With close to 0.6 million visitors annually to Mesa Verde National Park, NPS is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park. Mesa Verde National Park's website and online brochures make it easier to plan a trip and spend time in meaningful ways, whether spending a few hours, all day or multiple days within the park.

### 2010 VISITATION

Mesa Verde National Park had approximately recreational 560,000 visitors in 2010. About 1 percent of park traffic is non-recreational. Most non-recreation trips are from park employees and facility support services.

#### 2010 Visitation

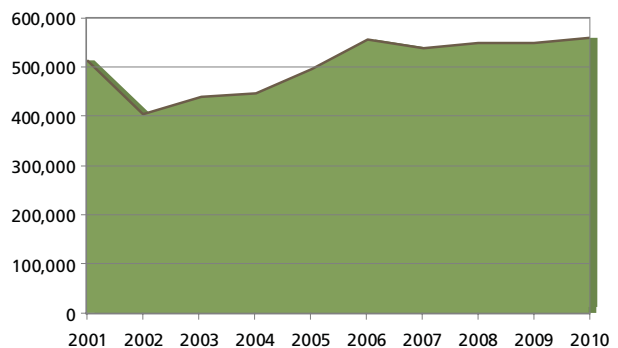
TOTAL VISITORS = 567,000



### ANNUAL VISITATION

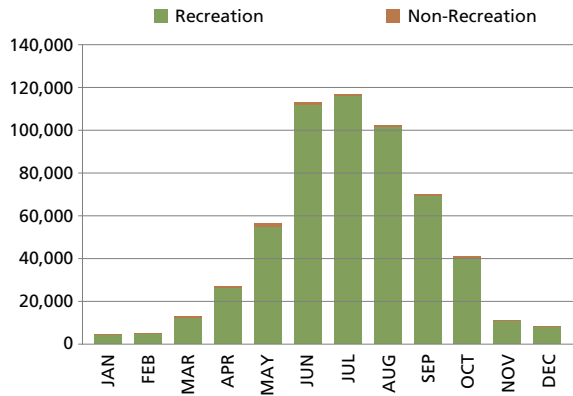
Visitation increased by about 1.9 percent per year since 2000, but has been rather steady since 2006. Non-recreation trips have been decreasing by about 10 percent per year.

#### Recreation Visitation 2001-2010

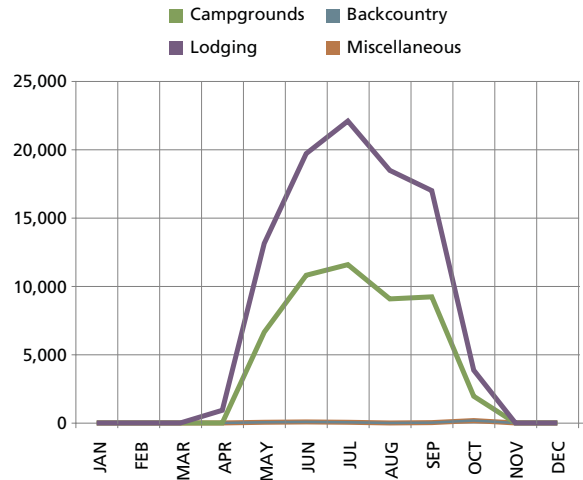


Peak visitation months are June, July, and August and account for 60 percent of annual visits. Lodging and campgrounds account for over 20,000 overnight stays in July.

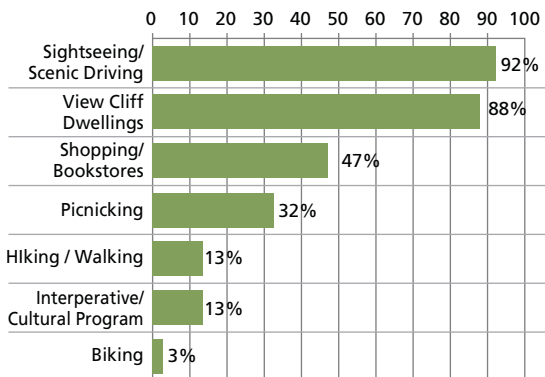
### Visitors By Month



### Overnight Stays By Month



## VISITOR ACTIVITIES



A majority of visitors participate in two primary activities, sightseeing/scenic driving and viewing cliff dwellings. Both of these activities rely on the transportation system provided within the park. Shopping, picnicking hiking/walking and cultural programs are also activities visitors participate in.

## VISITOR SERVICES USED

No data is available to assess the services visitors use within Mesa Verde National Park.

## CONGESTION AND THE VISITOR EXPERIENCE .....

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP completed in 2012. Report to be published in 2013. The previous survey, completed in 1987, was not consulted for this report.
- 2010 CMS Survey – did not participate
- Surveys & Interviews, 2011
  - Congested locations: congestion limited to about two weeks during peak visitation period
  - Due to limited number of visitor accessible areas (lower Chapin Mesa, Mesa Top Loop, Cliff Palace, Balcony House, and park entrance), transit shuttles and private vehicles may cluster at available sites
  - Strategies: road and trail repairs, replacement of the Wetherill shuttle system equipment/vehicles, conduct and implement the visitor redistribution plan

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in Mesa Verde National Park.

## AIR QUALITY AND GHG EMISSIONS .....

The Park had completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

### Mobile GHG Emissions

Park Operations (MTCO <sub>2</sub> E)	275.1
Visitors (MTCO <sub>2</sub> E)	5,328.5
Concessionaires (MTCO <sub>2</sub> E)	0.0
Total Mobile GHG Emissions	5,328.5

*Climate Leadership In Parks*

## HISTORIC ROADS .....

About 21% of the park's roadways and 18% of parking area is listed as historic.

.....**THREATENED & ENDANGERED WILDLIFE AND PLANT SPECIES**

Common Name	Species Name	Listing Category	Status in Park
Bald eagle	<i>Haliaeetus leucocephalus</i>	Delisted Monitored	Current
American peregrine falcon	<i>Falco peregrinus anatum</i>	Delisted Monitored	Current
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	Current
Southwestern willow flycatcher	<i>Empidonax traillii</i>	Endangered	Current
Brown bear	<i>Ursus arctos</i>	Threatened	Historic
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	Endangered	Historic
Gray wolf	<i>Canis lupus</i>	Endangered	Historic
Razorback sucker	<i>Xyrauchen texanus</i>	Endangered	Historic

There are no plant species currently listed as threatened or endangered, nor are there candidates for threatened or endangered status.

.....**SIGNIFICANT RESOURCES**

The significance of Mesa Verde National Park is established by the unique resources and values:

- Worldwide value is recognized by its selection as one of seven original World Heritage Cultural Sites.
- A natural resource preserve within a large ecosystem – the Colorado Plateau, Four Corners area. Mesa Verde National Park’s clean air, plants, animals, water, springs, geologic features, night skies and natural quiet contribute to the integrity of the large ecosystem.
- An example of human interaction with their environment over thousands of years. Mesa Verde National Park represents a significant aspect in the history and heritage of at least 24 specific tribes and clans.
- Contains nationally significant historic resources depicting early park structures and design, the CCC, homesteaders, and American Indian experiences. The Fewkes Cabin was the first museum in the national park system.
- Pioneering archeological research of the concentrated complex of spectacular and well preserved ancestral Pueblo and historic sites, reflecting a great variety of human activities, helped advance the field of archeology into a recognized and respected science. The size and quality of Mesa Verde National Park’s unique artifact and archival collection – over 2,000,000 objects – present a significant opportunity for research at the site of its origin.
- Grassroots concern about the destruction and artifact removal from Mesa Verde National Park served as a catalyst of passage in 1906 of National Antiquities Legislation and establishment of Mesa Verde National Park. Support for Mesa Verde National Park by the State of Colorado is exemplified by partnerships that began with the acquisition of the Wetherill collections in the late 19th century and continues today through tourism and preservation efforts.



## SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Mesa Verde National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

### REGIONAL AND COMMUNITY STAKEHOLDERS .....

Mesa Verde National Park is located between Cortez, CO, and Durango, CO. To the south the park is bordered by the Ute Mountain Indian Reservation. The Southern Ute Indian Reservation is also located nearby. National Forest Service and BLM lands are also in close proximity to the park. Highways managed and maintained by the Colorado DOT provide access to Mesa Verde National Park.

Regional Communities	<ul style="list-style-type: none"><li>• Cortez, CO</li><li>• Durango, CO</li></ul>
US Forest Service	<ul style="list-style-type: none"><li>• San Juan National Forest</li></ul>
US Bureau of Land Management	<ul style="list-style-type: none"><li>• Menefee Mountain Wilderness Study Area (WSA) * * * *</li><li>• Weber Mountain MSA</li></ul>
CDOT	<ul style="list-style-type: none"><li>• US 160</li><li>• US 491</li><li>• State Highway 145</li></ul>
Indian Nations	<ul style="list-style-type: none"><li>• Ute Mountain</li><li>• Southern Ute</li></ul>

..... **TRANSPORTATION RELATED PARTNERSHIPS**

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

**Existing Partnerships**

Park is currently involved with Southwest Colorado Transit Local Coordinating Council related to employee shuttle system and involved with ARAMARK and Southern Colorado Clean Cities Coalition in a DOE grant. Have received CDOT grant for work at new VRC and work closely with CDOT in park entrance/US 160 corridor – roadside clean up, fuels reduction, weed control.	
Mesa Verde Foundation	The Mesa Verde Foundation (MVF) is a 501(c)(3) non-profit, philanthropic partner to Mesa Verde National Park. Its mission is “to fund capital improvements, projects and educational endeavors for Mesa Verde National Park that promote an understanding of its cultural and natural resources.”
Mesa Verde Museum Association	The association provides educational and interpretive material to visitors of Mesa Verde National Park through an active publishing program and the operation of retail stores in the Chapin Mesa Archeological Museum, Far View Visitor Center, Colorado Welcome Center in Cortez and the online store. These resources enhance the visitor experience and proceeds from sales are donated to the park’s interpretive, research and education programs
Other: ARAMARK Mesa Verde, Grand Circle, Mesa Verde Country, CyArk	

..... **CLIMATE FRIENDLY PARKS**

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. The park has implemented some steps to reduce GHG emissions and reduce carbons, such as conversion to B20 for the diesel fleet that includes the Wetherill Mesa shuttle system vehicles. A partner grant with ARAMARK and the Southern Colorado Clean Cities Coalition is replacing gasoline power vehicles with electric/hybrids. The park also purchases electricity from renewable sources.



## PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS.....

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

### VISITOR EXPERIENCE

- Capacity and Congestion
  - The Park would like to distribute visitors to additional open areas. This is the top priority for the park.
  - Fairview Village Complex and Cedar Tree Lane are overcrowded and need an additional turn lane and signage.
- Parking
  - A ranger and ticket is required to tour the park sites. The maximum number of tickets sold equals the number of parking spaces at each area.
- ATS
  - Visitors routinely express complaints about crowding and travel on the shuttle system during the relatively short peak season.
- Communications and Information
  - The new Visitor and Research Center (VRC) at the park entrance will provide orientation and information as soon as visitors enter the park and will enhance visitor orientation. It is planned to be open by October of 2012 and should reduce the number of visitors parking along the entrance road.
- Bicycles and Pedestrians
  - The average bicyclist entering the park is experienced and comfortable with riding along the road adjacent to vehicles. The park is currently looking for alternatives to provide a safe passage of bicyclists through the unlit tunnel.

### RESOURCE PROTECTION

- Resources at Risk
  - A priority for the park is completion of the Visitor Distribution and Transportation Plan. Implementation would disperse impacts to sensitive sites to a more manageable level.
  - Tour tickets for the main attractions in the park are a successful method to control visitation and resource impacts at peak times.
- Wildlife
  - Some problems with wildlife/vehicle collisions occur; the increasing population of feral horses poses additional animal/vehicle conflicts.

### SUSTAINABLE OPERATIONS

- Climate Change and GHG
  - The park has implemented steps to reduce GHG emissions and reduce carbons: conversion to B20 for the diesel fleet and the Wetherill Mesa shuttle system vehicles, receipt of a partner grant with ARAMARK and the Southern Colorado Clean Cities Coalition to purchase electric/hybrid vehicles, and purchasing electricity from renewable sources.

# Rocky Mountain National Park

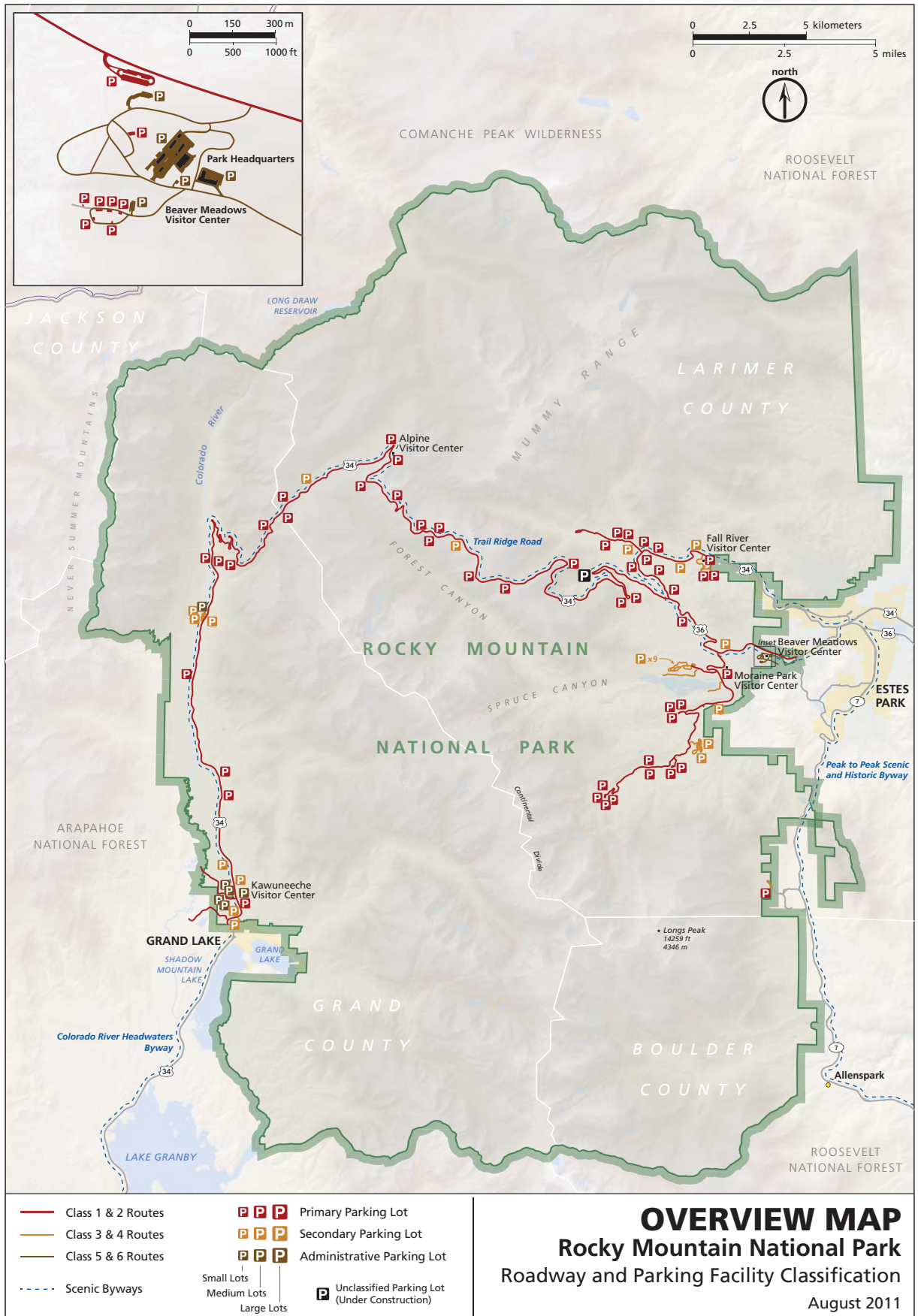
(ROMO)



ROMO



INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT



# ROCKY MOUNTAIN NATIONAL PARK (ROMO)

## AT A GLANCE

**STATE:** Colorado **SIZE:** 415 square miles **TYPE:** Outlying

### ROADWAY/PARKING CONDITION (CYCLE 4)

	PCR	DM	Lane Miles	Area/Spaces
Roadways	83 / FAIR	11.9 Million	147	–
Parking	73 / FAIR	\$2.4 Million	–	1,507,000 SF / 2,470
Replacement Value of All Transportation Assets			\$324.3 Million	

Asset Management

### CONGESTED AREAS

- Park Access Roadways
- Other Park Attractions
- Parking Areas
- Park Entrance Stations
- Pedestrian Loading Areas
- Pedestrian Paths/Trails
- Primary Vehicle Tour Routes
- Scenic Overlooks
- Shuttle Stops
- Trailheads
- Visitor Centers

### ALTERNATIVE TRANSPORTATION SYSTEM

Annual Boardings	435,000
Fuel Type	Biodiesel

### FEES

Transportation Fee	\$4.19
FLREA (% retention)	80%

Mobility, Access, & Connectivity

### VISITATION (2010)

Total Visitors	3,128,000
Non-Recreation Visitors	173,000
Recreation Visitors	2,956,000
10-Year Trend	-5.7%

### VISITOR EXPERIENCE QUALITY SCORE

Roads	Parking	Date
72	74	2010

(University of Idaho Survey)

### TOP ACTIVITIES

- Viewing scenery
- Driving Trail Ridge Road
- Wildlife viewing/birdwatching
- Hiking
- Camping

Visitor Experience

### AT-RISK RESOURCES

- Scenic landscapes
- Alpine tundra
- Wildlife
- Air quality
- Soundscape

Air Quality Status Monitored\*

\*See page 67

### TRANSPORTATION/RESOURCE ISSUES

- Visitor distribution
- Crowding impacts at shuttle stops
- Diesel power buses
- Wildlife/vehicle crashes

### MAJOR HISTORIC TRANSPORTATION ASSET

- Fall River Road
- Lake Trail Ridge Road

Resource Protection

### KEY PARTNERS

- Town of Estes Park
- Town of Grand Lake
- Western Transportation Institute
- Denver Regional Council of Governments (MPO)
- CDOT/Region 3/4

Climate Friendly Park Status Certified

Green House Gas Emissions 3,540 Metric Tons

(Rocky Mountain National Park Action Plan)

Sustainable Operations

ROMO

### Key Transportation Findings and Challenges

<b>Asset Management</b>	<p>59% of Class 1 &amp; 2 roadway lane miles are in Good condition. Overall roadway PCR improved from 77 (Cycle 3) to 83 (Cycle 5).</p> <p>66% of public parking areas are in Poor or Fair condition. Public parking PCR saw little change from Cycle 3 to Cycle 5.</p> <p>\$15.9 M in deferred maintenance of transportation assets, about 2% of total IMR DM.</p> <p>The snow removal effort and maintenance of Trail Ridge Road requires specialized equipment and major labor effort each spring.</p>
<b>Mobility, Access, &amp; Connectivity</b>	<p>3,500 large vehicles (primarily RVs) visit monthly during peak season, impacting narrow mountain roads and parking areas.</p> <p>Many congested areas identified by park staff and CMS survey, including visitor centers, parking areas, trail heads, scenic overlooks, and transit stops.</p> <p>The shuttle systems are popular, and help to reduce roadway congestion, but contribute to concentrated pedestrian traffic impacts such as social trailing at shuttle stops, vegetation and soils impacts, and trail congestion.</p>
<b>Visitor Experience</b>	<p>2010 Recreation Visitation 2,955,821 (Large).</p> <p>Recreational visitation dropped 0.7% annually 2001-2010.</p> <p>The shuttle service has been identified as actually increasing congestion at the Bear Lake Area since more visitors are now able to visit the area on a daily basis.</p> <p>38% of vehicle crashes occur on Trail Ridge Road.</p> <p>Current information ITS applications do not provide enough information to result in reasonable congestion mitigation.</p>
<b>Resource Protection</b>	<p>Emphasis to distribute visitors more evenly throughout the park.</p> <p>Shuttle service has positive impacts to congestion but increases some negative impacts such as crowding at popular destinations, increased erosion and social trails, compaction of soils, damage to fragile ecologies, and opportunities for solitude.</p> <p>53% of roadway lane miles and 2% of parking areas are designated as historic, including the Trail Ridge Road, Fall River Road, and associated bridges.</p> <p>A significant number of wildlife/vehicle collisions (deer, elk) are reported on park roads.</p> <p>The Park carefully manages traffic at wildlife viewing areas to mitigate safety concerns for visitors, vehicles, and wildlife.</p> <p>Noise and air quality impacts created by diesel powered buses.</p>
<b>Sustainable Operations</b>	<p>Climate Friendly Park Certified.</p> <p>Major snow removal and other high altitude maintenance challenges.</p> <p>Roadway maintenance costs outstripping funding availability.</p> <p>The park has a solid relationship with Estes Park, including some overlapping shuttle operations.</p> <p>The connection to the town is critical for the health of the Park and the town.</p>

### MISSION

The NPS mission at Rocky Mountain National Park is to care for, protect, manage, improve, understand, and interpret park resources and provide for a high-quality visitor experience. The significance is centered on the geology encompassed within the park. Rocky Mountain National Park provides exceptional accessibility to a wild landscape with dramatic scenery, opportunities for solitude and tranquility, wildlife viewing and a variety of recreational opportunities. The fragile alpine tundra encompasses one third of the park and is one of the main scenic and scientific features for which the



park was established. This is one of the largest examples of alpine tundra ecosystems preserved in the national park system in the lower 48 states.

## PARK DESCRIPTION

Rocky Mountain National Park is 415 square miles in size and was established in 1915. The initial establishment of the park focused on the its scenic and natural wonders. Future discoveries within the park identified cultural treasures such as ancient trails, game drives, cattle ranches and lodges.

Rocky Mountain National Park features majestic mountain views, a variety of wildlife, and varied climates and environments from wooded forests to mountain tundra. The park spans the continental divide, includes the headwaters of the Colorado River, and contains over 60 named peaks higher than 12,000 feet in elevation. Over one fourth of the park resides above the tree line. The Long Expedition, led by Stephen H. Long, visited the area in 1820 but never entered the mountains. In 1880 a small mining rush began in the Never Summer Mountains. Mountain water, however, proved more valuable than gold. The Grand Ditch in the Never Summer Range intercepted the stream source of the Colorado River and diverted it for cattle and crops in towns such as Greeley and Fort Collins.

The 1920s and 1930s saw a boom in the construction of infrastructure within the park including lodges and roads. The Civilian Conservation Corp was active in building park roads, trails, and buildings; planting trees; managing predators; and putting out forest fires. It was during the 1930s that the National Park Service built Trail Ridge Road. The park has always been an auto park and never had railroad access like Yellowstone, Glacier, or Grand Canyon, making road building a high priority.

## PARK LOCATION

Rocky Mountain National Park is located in north-central Colorado. Estes Park, CO, is located just outside the east entrances of the park. The park is 65 miles from Denver, CO, 85 miles from Cheyenne, WY, and 495 miles from Salt Lake City, UT.

Nearby National Park Service units include:

- Florissant Fossil Beds National Monument (170 miles)
- Fort Laramie National Historic Site (200 miles)
- Dinosaur National Monument (300 miles)
- Colorado National Monument (300 miles)
- Black Canyon of the Gunnison National Park (355 miles)

## TRANSPORTATION OVERVIEW

Rocky Mountain National Park provides 147 lane miles of roadway and 1.51 million square-feet (2,470 spaces) of parking infrastructure. The Park has three primary entrances, one on the west side of the park and two on the east. The busiest entrance is the Beaver Meadows entrance on US Highway 36 in Estes Park. This entrance provides access to Bear Lake Road as well as Trail Ridge Road. The other two entrances are on US Highway 34 at the east and west ends of Trail Ridge Road.

There are two primary roads within the park. Trail Ridge Road is open during the summer months and is the only route between the east and west portions of the park. The route is a steep, narrow, winding mountain road that travels above 11,000 feet in elevation for several miles. Bear Lake Road is open year round and serves the most popular areas of the park. The two primary roadways provide access to the five visitor centers that are located throughout the park.

The park operates an extensive transit system with over 435,000 annual boardings. Three routes serve all of the most popular destinations on the east side of the park, with connections to Estes Park, the primary gateway community.

## ASSET MANAGEMENT

The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Rocky Mountain National Park transportation assets is \$324.3 million.

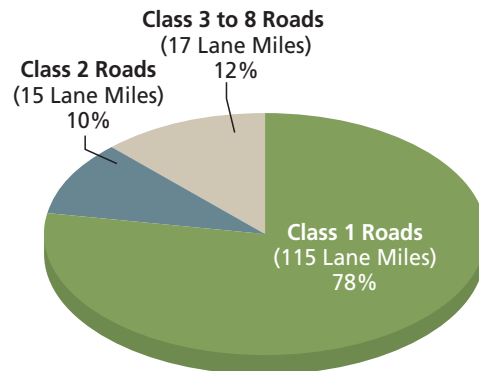
### Rocky Mountain National Park Roadway and Parking Assets

- Approximately 147 lane miles of roadway network on 46 different routes.
- Approximately 1,507,000 square feet (2,470 spaces) of parking area provided in 109 identified parking areas.
- 130 Lane miles are defined as Class 1 or 2 roads (88%).

### ROADWAY ASSETS

Class 1 & 2 roads comprise 88 percent of roadways in Rocky Mountain National Park. The breakdown of roadway classifications within Rocky Mountain National Park is very similar to the classification breakdown for the IMR as a whole.

**TOTAL LANE MILES = 147**



### ROADWAY PAVEMENT CONDITION RATING (PCR)

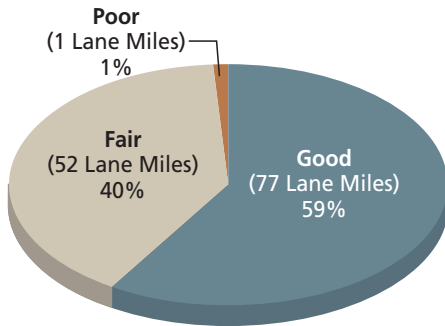
The Class 1 roadways have an average PCR rating of good and the Class 2 roadways are fair. All other roadways have an average condition of poor.

Roadway Type	Average PCR*
All Roadways	83 - FAIR
Class 1	89 - GOOD
Class 2	80 - FAIR
Class 3 to 8	56 - POOR

\*Cycle 5 RIP data

## CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

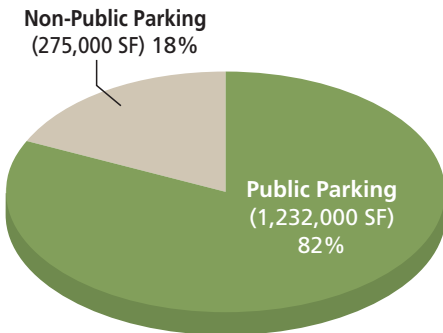
TOTAL LANE MILES = 130



Fifty-nine percent of roadway pavement classified as Principal Park Road (Class 1) or Connector Park Road (Class 2) within the park is rated as good. Only 1 percent of Class 1 & 2 roadways are in poor condition.

## PARKING ASSETS

TOTAL SQUARE FEET = 1,507,000



Approximately 82 percent of the parking facilities in Rocky Mountain National Park are classified as public; while the remaining 32 percent is non-public. Park-wide, there are approximately 2,020 public parking spaces and 450 non-public parking spaces. Approximately 1.51 million square feet of pavement are maintained in the parking areas.

## PARKING PAVEMENT CONDITION RATING (PCR)

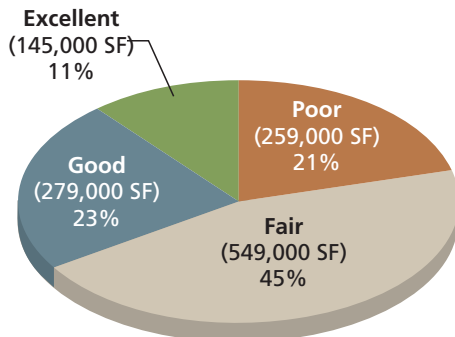
Parking Type	Average PCR*
Public Parking	77 - FAIR
Non-Public Parking	54 - POOR
All Parking	73 - FAIR

\*Cycle 5 RIP data

The average PCR for parking and roadway conditions is rated as fair. The average PCR for parking is lower than the average PCR for roadways.

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

TOTAL SQUARE FEET = 1,232,000



The average PCR for public parking assets is fair. Sixty-six percent of public parking areas are in fair or poor condition. Park-wide, public parking areas contain approximately 240 spaces (145,000 square feet) in excellent condition, 455 spaces (279,000 square feet) in good condition, and 850 spaces (549,000 square feet) are in fair condition. The remaining 475 spaces (259,000 square feet) are in poor condition.

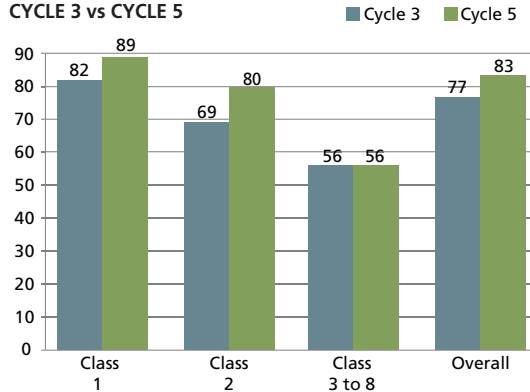
## ASSET CONDITIONS OVER TIME .....

The most recent cycle of RIP data available for Rocky Mountain roadways and parking is Cycle 5. A comparison of Cycle 3 and Cycle 5 asset data provides a snapshot of the conditions of Rocky Mountain assets over time. Between 2006 and 2012, the average roadway pavement conditions within the park degraded slightly from 77 to 75. The average parking pavement conditions improved from a PCR of 78 to 86.

### ROADWAY

Average pavement conditions improved for Class 1 & 2 roadways and remained steady for Classes 3 to 8 roadways. Class 1 roadways are in good condition. Overall, roadways in the park have an average condition of fair, approaching good.

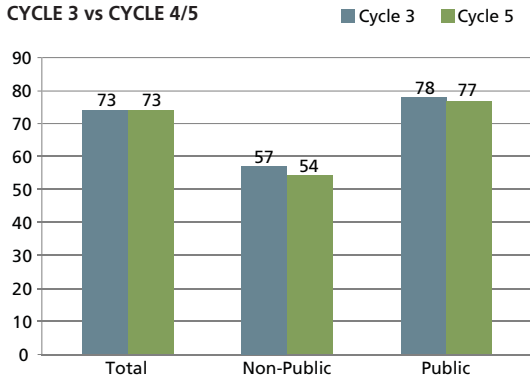
**ROADWAY CONDITIONS**  
CYCLE 3 vs CYCLE 5



### PARKING

Average pavement conditions for parking areas remained in fair condition. Public parking areas have an average condition of fair, while non-public parking is in poor condition.

**PARKING CONDITIONS**  
CYCLE 3 vs CYCLE 4/5

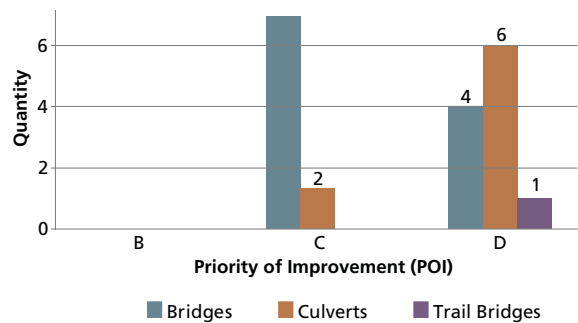


TRANSPORTATION TRAILS

The Park does not contain any transportation trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities."

BRIDGE AND TUNNEL ASSETS

Bridge and Tunnel Assets

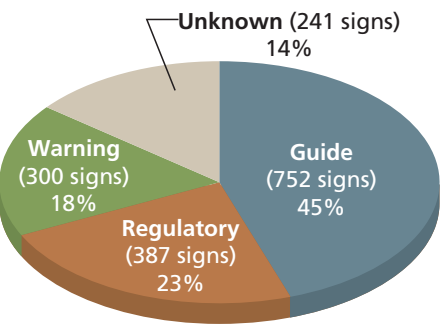


Rocky Mountain National Park maintains numerous structures. The park contains 11 bridges, 8 culverts, and a trail bridge. All of these assets have a POI of C or D indicating none of the structures have immediate maintenance needs.

TRANSPORTATION SIGN ASSETS

Sign Asset Quantity and Condition

TOTAL SIGNS = 1680



Rocky Mountain National Park roadways and parking areas contain 1,680 transportation signs. Approximately 45 percent of the signs are guide signs meant to direct visitors to the desired destinations. Forty-one percent of the signs are regulatory and warning signs. The remaining 14 percent (241 signs) have unknown types since the signs are either missing or unreadable.

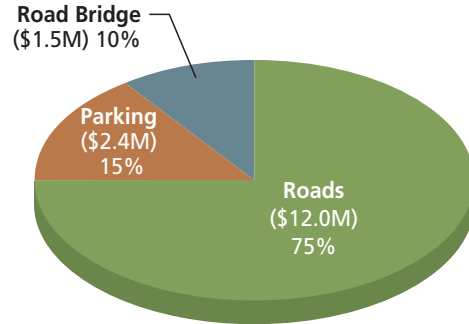
Condition	Quantity
Good	1,679
Fair	1
Poor	0

## DEFERRED ASSET MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Deferred maintenance within Rocky Mountain National Park totals \$15.9 million.
- Three-quarters of deferred maintenance is associated with park roadways (75%).
- Roadways and parking constitute approximately 90 percent of the park's total deferred maintenance for transportation assets.
- Previous Cycle 3 data included \$19.8 million of deferred maintenance for trails. Comparable trails data was not provided for Cycle 4/5.

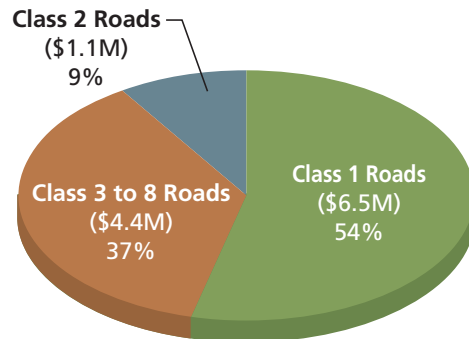
**TOTAL DEFERRED MAINTENANCE = \$15.9M**



## DEFERRED ROADWAY MAINTENANCE

- Roadway maintenance within Rocky Mountain totals \$12.0 million
- Sixty-three percent of roadway deferred maintenance in Rocky Mountain is associated with Class 1 & 2 roadways
- Class 1 & 2 roadway deferred maintenance is a smaller proportion of the total roadway DM compared to other focus parks and the IMR.

**TOTAL DEFERRED MAINTENANCE = \$12.0M**





## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks, and in Rocky Mountain National Park, has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. In Rocky Mountain National Park, this system includes multimodal facilities that enable visitors to get around. These facilities include trails, a visitor shuttle as well as a circulator shuttle within the town of Estes Park. Not all facilities that serve to connect the region and the nation to the park are owned or operated by NPS. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Some pieces of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

### .....ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

Alternative transportation systems is a term applied to NPS transit operations such as shuttle buses, or in the case of Rocky Mountain National Park, multiple shuttle bus routes. A set of free shuttle routes operate in the Bear Lake Road area of the park. The shuttles operate from early June to early October. Shuttles operate every 15 minutes to hour depending on the route and time of day.

The Bear Lake route operates between the shuttle Park & Ride (near the Glacier Basin Campground) and the Bear Lake Trailhead. The Moraine Park route operates between the shuttle Park & Ride and the Fern Lake Trailhead. These shuttles make intermediate stops at other trailheads along each route.

A hiker shuttle, provided by the park, connects to the town shuttle system at the Estes Park Visitor Center. The shuttle provides service to the Beaver Meadows Visitor Center and connects riders to the Bear Lake and Moraine Park shuttle routes. All shuttle services on these routes are free with paid admission to Rocky Mountain National Park. Riders can purchase a park pass at an automated fee machine at the Estes Park Visitor Center.

The three routes combine to provide over 9,000 service hours and 126,000 service miles each year. Approximately 326,000 visitors ride the shuttle service each year. The current service plan provides excess capacity to serve many more visitors.

Rocky Mountain National Park ATS Summary

<b>Annual Boardings<sup>1</sup></b>	435,000
<b>Service Hours<sup>1</sup></b>	9,900
<b>Service Miles<sup>2</sup></b>	126,000
<b>Quantity and Type<sup>3</sup></b>	Eight low floor buses Two 15-passenger cutaway buses
<b>Fuel<sup>3</sup></b>	Low floor: diesel Cutaway buses: gasoline
<b>Operating Season and Schedule<sup>3</sup></b>	Memorial Day through first week of October
<b>Operator<sup>3</sup></b>	McDonald Transit
<b>Options to using the ATS</b>	Private vehicles
<b>Bus Shelters</b>	7 total - 3,800 sq. ft.

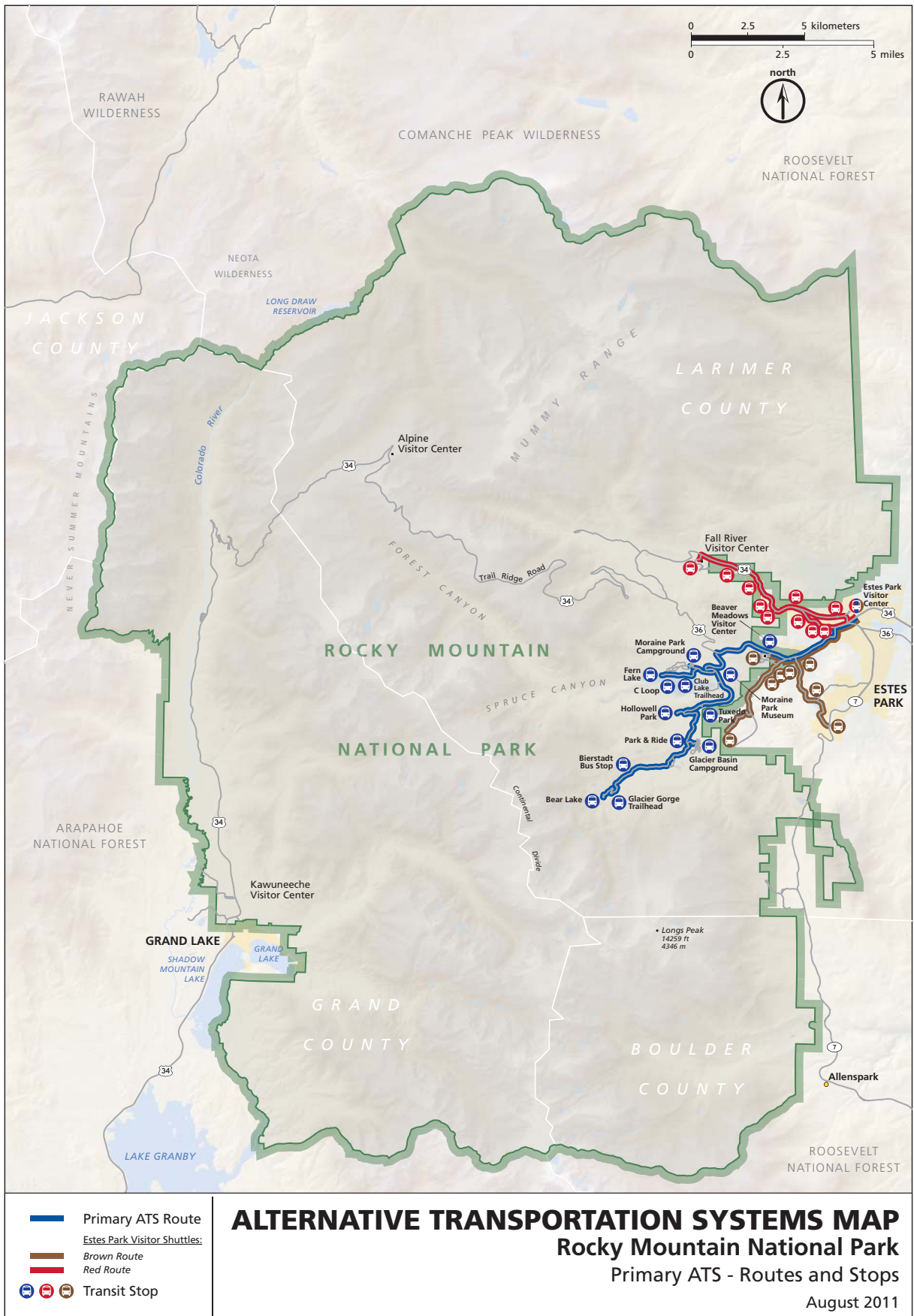
A free shuttle also operates during summer months within the town of Estes Park. The shuttle does not enter Rocky Mountain but provides circulator service between hotels, campground and restaurants along three different routes.

<sup>1</sup>Source: ROMO Phase II ATS PRO FORMA

<sup>2</sup>Source: 2007 Operating Statistics compiled in DEA Baseline Conditions Report

<sup>3</sup>ROMO ATS Phase II Operational and Contractual Characteristics Report

INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT



In addition to the free shuttles, one other shuttle serves park visitors. Rocky Mountain Transit Management, in conjunction with Rocky Mountain National Park, offers an interpretive tour of Trail Ridge Road. The tour is on a reservation basis only and requires payment of an additional fee. One tour operates daily from the Beaver Meadows Visitor Center.

## ..... • MULTI-MODAL CONNECTIVITY

Within Rocky Mountain National Park, bus shelters and park information have been provided at all transit stops within the park. Pedestrian crossings (pavement marking, signs) have been provided at several locations.

Bicycles are permitted on park roads only. The park currently has no designated bike trails but is in the planning process for a multi-modal trail on the east side of the park. The next shuttle bus contract (2012) will consider adding bicycle racks to the buses. Bicycle tours of the park are available from businesses located in nearby communities.

In May 2012, Interior Department and Colorado officials signed an agreement to plan for uninterrupted trail/transportation linkage that will connect the Denver metro area's trail systems, the three National Wildlife Refuges in the metro region, Rocky Mountain National Park, and community trails systems in between.

## ..... • SCENIC BYWAYS

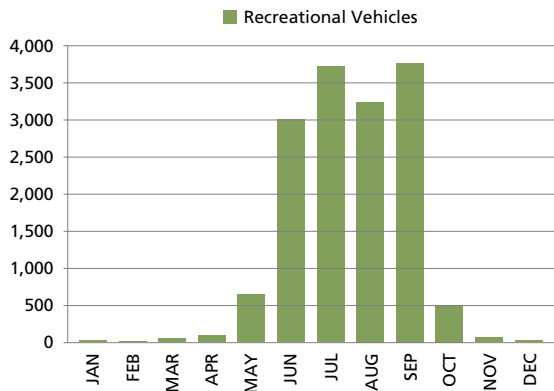
HWY #	DESIGNATION	SCENIC BYWAY
US 36/US 34	State, NSB, NFSB	Trail Ridge Road/Beaver Meadow Road
SH 119/SH 72/SH 7	State, NSB, NFSB	Peak to Peak Scenic and Historic Byway
<a href="http://www.nps.gov">www.nps.gov</a>		
NSB = National Scenic Byway, NFSB = National Forest Scenic Byway, State = State Scenic Byway		

## CONGESTION

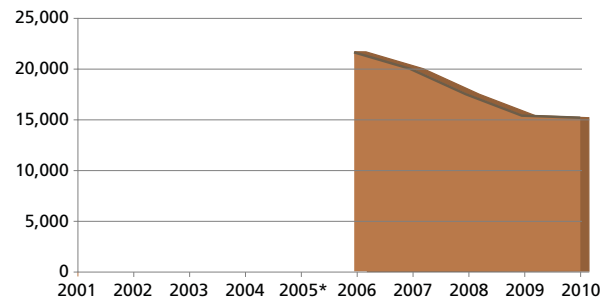
The number of vehicles entering the park increased slightly from 2002 to 2010. The peak visitation month in 2010 was July. Rocky Mountain National Park welcomes approximately 8,480 vehicles on a peak visitation day.

During peak season, over 3,000 RVs visit Rocky Mountain National Park in a month. The volume of commercial tour buses that enter Rocky Mountain National Park is not available but it is expected that the number of RVs greatly outnumbers the volume of commercial tour buses.

RV Vehicles



Annual RV Overnights



The number of RVs entering the park appears to be decreasing based on the number of overnight RV stays in the park.

## CONGESTED LOCATIONS

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff provided a great many congested areas within the park. Many locations on the east side of the park along Bear Lake Road are identified multiple times as congested locations.

Congested Areas	Locations Identified
Park Access Roadways	US 34, US 36
Other Park Attractions	Moraine Park, Horseshoe Park, Kawuneeche Valley
Parking Areas	Bear Lake Trailhead, Longs Peak Trailhead, Alpine Visitor Center, Glacier Gorge Trailhead, Visitor Transit PnR
Park Entrance Stations	Beaver Meadows Entrance, Fall River Entrance, Grand Lake Entrance
Ped/People Loading Areas	Bear Lake Trailhead, Glacier Gorge Trailhead, Visitor Transit PnR
Ped Paths/Trails	Bear Lake Trail, Glacier Gorge Connector, Longs Peak Trail, Thunder Lake Trail, Cub Lake Trail/Fern Lake Trail
Primary Vehicle Tour Routes	Trail Ridge Road, Bear Lake Road, Wild Basing Road
Scenic Overlooks	Many Parks Curve, Rainbow Curve, Forest Canyon Overlook, Rock Cut
Trailheads	Bear Lake Trailhead, Glacier Gorge Trailhead, Longs Peak Trailhead, Wild Basin Trailhead, Cub Lake/Fern Lake Trailhead
Transit Stops	Bear Lake Trailhead, Glacier Gorge Trailhead, Visitor Transit PnR
Visitor Centers	Alpine Visitor Center

## ..... CONGESTION MITIGATION STRATEGIES

In the 2010 Service-wide CMS survey, park staff identified multiple congestion mitigation strategies currently used within the park. These strategies indicate that park staff is attempting to manage traffic in multiple ways using many types of resources.

Congestion Mitigation Strategy *	Mitigation Result*
Alternative Transportation Systems (ATS)	Adding to pedestrian traffic and impacting resources and visitor experience
Changes in Traffic Circulation	Attempts to divert traffic are helping reduce single unit vehicles, but transit is allowing continued access
Expanded Parking Supply	If you build it, they will come. We can't keep up with the demand
Fast Pass	Successful
Special Event Management	Elk Bugle Corps and Bighorn Brigade (volunteer groups) are helping to manage congestion
Remote Lots with Shuttle Service	Adding to the number of pedestrians in the park
Worked with Local Communities	In progress

\* Source: Service-Wide Congestion Management system (CMS); Phase 1: Emphasis Area Identification, Technical Memorandum 7: Compiled Congestion Survey

## ..... ITS STRATEGIES

Park staff identified two ITS congestion mitigation strategies currently in use in the 2010 Service-wide CMS survey, but indicated that not enough meaningful information is being provided through ITS applications to produce a meaningful result in terms of congestion levels.

ITS Strategy	Mitigation Result
Traffic Information	Not enough information being provided
Variable Message Signs	Not enough information being provided

*The 2011 Update on ITS in NPS* report by The Volpe Center showed the following ITS strategies in use at Rocky Mountain National Park.

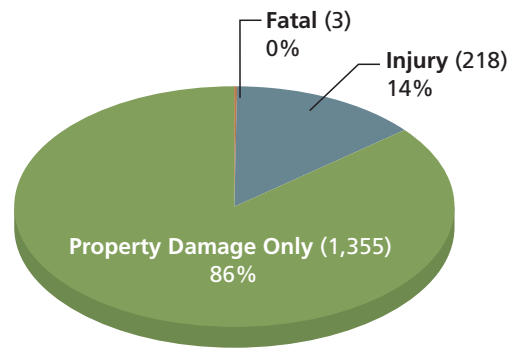
Dynamic Message Signs (portable and permanent)	511 System Integration	Highway Advisory Radio	Trip Planning Tools	Automated Entry System	Automated Fee / Fare Payment	Coordinate with Other Agencies
x	x	x	x	x	x	x

2011 Update on ITS in NPS, Volpe Center

## CRASH SEVERITY

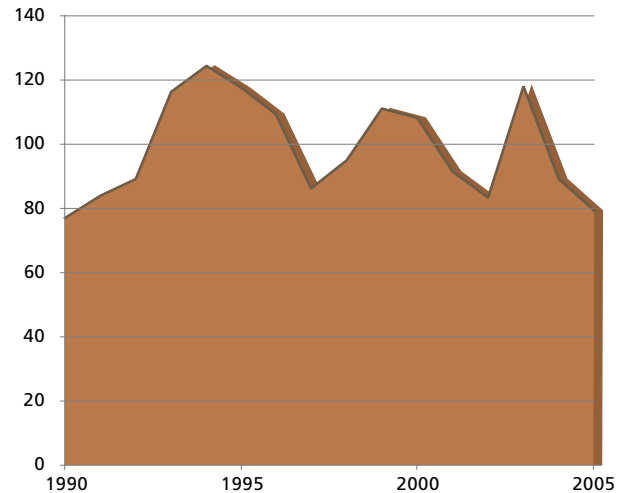
Rocky Mountain National Park experienced 1,576 crashes between 1990 and 2005. Three crashes included a fatality and 218 included at least one injury. The majority (86%) were property damage only.

TOTAL CRASHES = 1,576



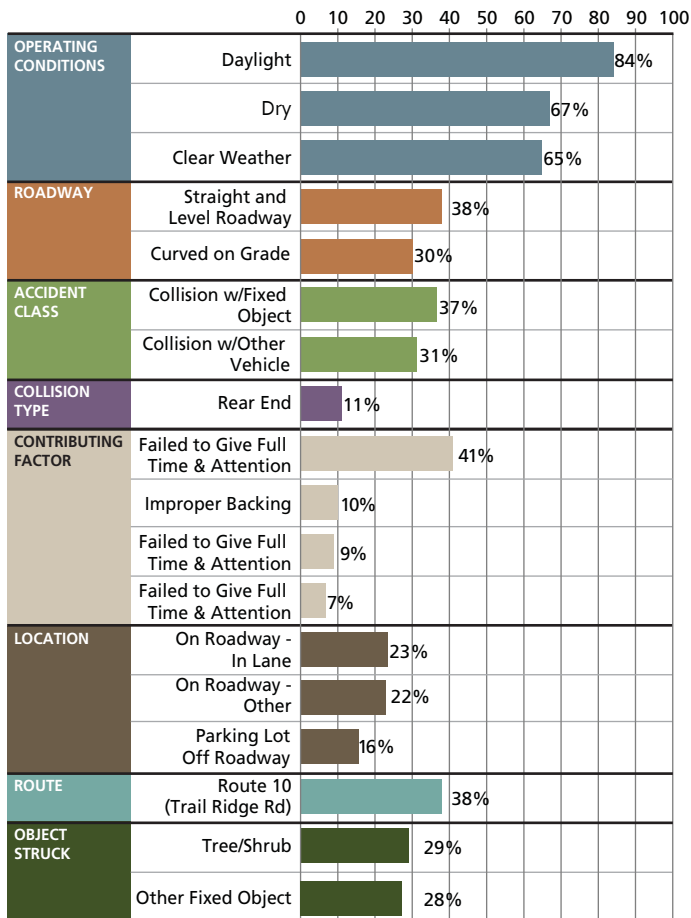
## ANNUAL CRASHES

Rocky Mountain National Park averages approximately 99 crashes each year. The park has experienced a rather consistent number of crashes each year since 1990. Crash totals fluctuate up and down on an annual basis, rarely varying by more than 20 crashes. The crash rates within Rocky Mountain National Park are not identified as higher than expected based on State of Colorado crash experience.





..... CRASH CONDITIONS (1990 - 2005)



A majority of crashes in Rocky Mountain National Park occur during daylight and dry conditions. However, a higher percentage of crashes occur during wet and overcast conditions compared to the other focus parks. Collisions with fixed objects and other vehicles account for 68 percent of crashes. Approximately 30 percent of crashes occur on highway curves. About 38 percent of crashes occur on Trail Ridge Road, which is the main park road. Over one-third of crashes are a result of driver inattention.

## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information that the National Park Service collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Rocky Mountain National Park. With close to 3 million visitors annually, the National Park Service is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park. Rocky Mountain's website, including "Roaming Rocky Podcasts," "Science Behind the Scenes" videos, webcams, and blogs, as well as their Twitter and Facebook sites, makes it easier to plan a trip and spend time in meaningful ways, whether spending a few hours, all day, or multiple days within the park.

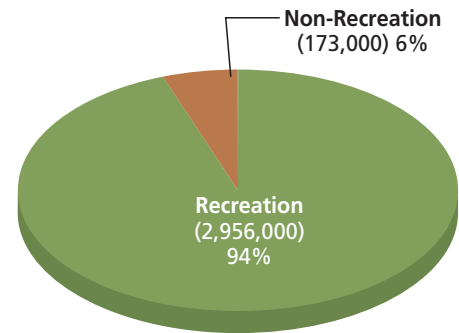
### 2010 VISITATION

Rocky Mountain National Park had approximately 2,956,000 recreational visitors in 2010. About 6 percent of park traffic is non-recreational. Most non-recreation trips are commercial vehicles on US 34, and traffic on SH 7 and Forest Service Road 491. Visitation has decreased by about 0.8% per year since 2000, but has seen steady increases since 2008.

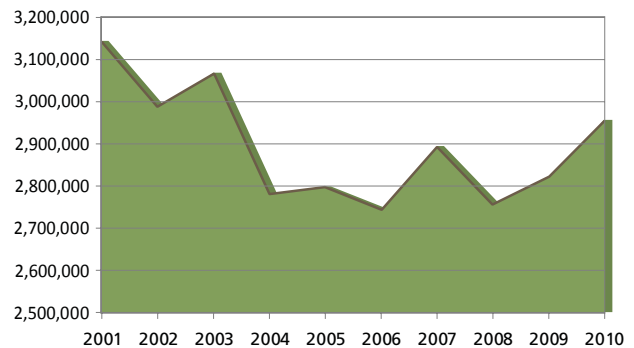
Non-recreation trips have been decreasing by about 1.2% per year.

#### 2010 Visitation

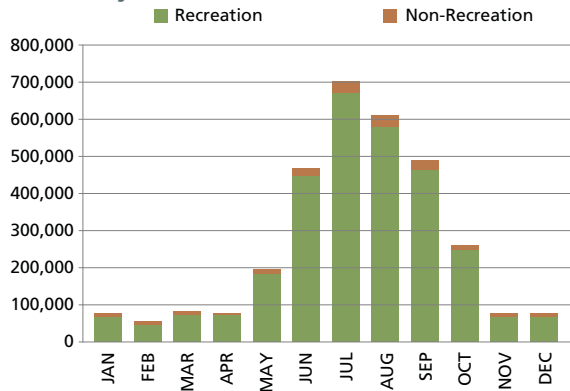
**TOTAL VISITORS = 3,128,000**



#### Recreation Visitation 2001-2010

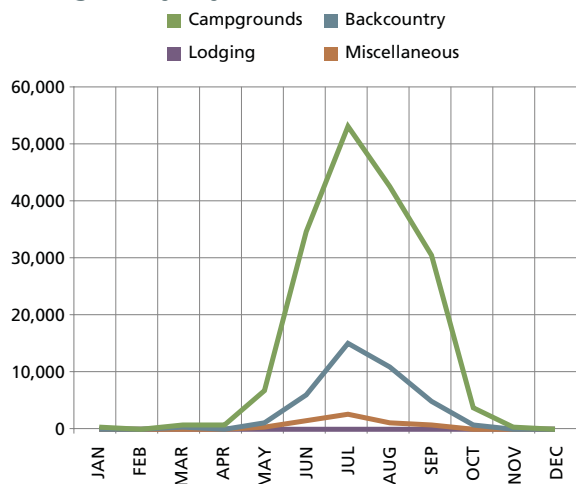


### Visitors By Month



Peak visitation months are July, August and September – accounting for 60% of annual visits. Campgrounds and backcountry camping account for over 50,000 overnight stays in July. Rocky Mountain National Park does not have a park lodge – the only overnight opportunities are via camping.

### Overnight Stays By Month



ROMO

## VISITOR ACTIVITIES & VISITOR SERVICES USED

Data not available.

## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP, 2010 and 2011, stated detractions/negative visitor comments: crowding, traffic noise
- 2010 CMS Survey
  - Congested locations: park access roadways, other park attractions, parking areas, park entrance stations, ped/people loading areas, pedestrian paths/trails, primary vehicle tour routes, scenic overlooks, transit stops, trailheads, visitor centers
  - Strategies: ATS, Fast Pass, manage special events, remote parking with shuttles, worked with local communities, expanded parking supply, changes in traffic circulation
- Surveys & Interviews, 2011
  - Congested locations: popular trailheads and visitor destinations, parking areas
  - Strategies: hiker shuttle from gateway community, park website, pilot ITS project, multi-million dollar road improvements, new entrance stations with Fast Pass lanes

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in Rocky Mountain National Park.

### AIR QUALITY AND GHG EMISSIONS

The park is located near the Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado, non-attainment area that is monitored for 8-hour ozone.

The park completed an internal baseline assessment of greenhouse gas (GHG) emissions in 2008. This assessment gives the park the opportunity to track the change in emissions over time. The Rocky Mountain National Park Action Plan set the following emission reduction goals:

- Reduce the park's GHG emissions to 17 percent below 2005 levels by the year 2017 by implementing emission mitigation actions identified by the park.
- Reduce transportation emissions by 469 MTCE below 2005 levels by 2017.

#### GHG Emissions

Sector	2005 Total GHG Emissions (MTCE)
Energy	719
Transportation	2,768
Waste	53
Other	0
Total	3,540

*Rocky Mountain National Park Action Plan, 2007*

### SIGNIFICANT RESOURCES

The significance of Rocky Mountain is centered on the geology encompassed within the park. The park provides exceptional accessibility to a wide landscape with dramatic scenery, opportunities for solitude and tranquility, wildlife viewing, and a variety of recreational opportunities. The fragile alpine tundra encompasses one third of the park and is one of the main scenic and scientific features for which the park was established. It is one of the largest examples of alpine tundra ecosystems preserved in the national park system in the lower 48 states.

The park, which straddles the Continental Divide, preserves some of the finest examples of physiographic, biologic, and scenic features of the southern Rocky Mountains. The park contains the headwaters of several river systems, including the Colorado River. Geologic processes, including glaciation, have resulted in varied and dramatic landscapes. Elevations span from 7,630 feet to 14,259 feet atop Longs Peak, a landmark feature. The park's varied elevations encompass diverse ecosystems where wilderness qualities dominate. Varied plant and animal communities and a variety of ecological process prevail within Rocky Mountain.

### HISTORIC ROAD ASSETS

Trail Ridge Road and Fall River Road are two major historic roads in the park, representing 53% of total lane miles. In addition, 2% of the parking area is listed as historic.

.....THREATENED AND ENDANGERED WILDLIFE SPECIES

Common Name	Species Name	Listing Category	Status in Park
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Delisted Monitored	Current
Canada Lynx	<i>Lynx canadensis</i>	Threatened	Current
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Delisted Monitored	Current
Greenback Cutthroat Trout	<i>Oncorhynchus clarkii stomias</i>	Threatened	Current
Brown Bear	<i>Ursus arctos</i>	Threatened	Historic
Gray Wolf	<i>Canis lupus</i>	Endangered	Historic
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened	Historic
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	Candidate	Historic

## SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Rocky Mountain National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

.....REGIONAL AND COMMUNITY STAKEHOLDERS

Rocky Mountain National Park is located in the Front Range of the Colorado Rocky Mountains, the most populated corridor in Colorado. At least half of the state's population lives within 2 hours of the park, including the Denver Metropolitan area. US highways, which are maintained by FHWA and the Colorado DOT, provide access to the park. The Town of Estes Park is the primary gateway community that provides circulator shuttle service to park visitors. The Town of Grand Lake is the park's other gateway community to the west. The park is surrounded by two national forests, Roosevelt and Arapaho, which are managed by the National Forest Service.

Regional Communities	<ul style="list-style-type: none"> <li>• Estes Park, CO</li> <li>• Grand Lake, CO</li> </ul>	<ul style="list-style-type: none"> <li>• Granby, CO</li> </ul>
Regional MPOs	<ul style="list-style-type: none"> <li>• Denver Regional Council of Governments (DRCOG)</li> </ul>	<ul style="list-style-type: none"> <li>• North Front Range MPO (NFRMPO) (Loveland, Greeley, Fort Collins)</li> </ul>
US Forest Service	<ul style="list-style-type: none"> <li>• Routt National Forest</li> <li>• Roosevelt National Forest</li> </ul>	<ul style="list-style-type: none"> <li>• Arapaho National Forest</li> <li>• Arapaho National Recreation Area</li> </ul>
US Bureau of Land Management	<ul style="list-style-type: none"> <li>• Shadow Mountain Lake</li> </ul>	
US DOT (FHWA) and WYDOT	<ul style="list-style-type: none"> <li>• US 34</li> <li>• US 36</li> </ul>	<ul style="list-style-type: none"> <li>• US 40</li> <li>• SH 7</li> </ul>

## TRANSPORTATION RELATED PARTNERSHIPS .....

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

### Existing Partnerships

<ul style="list-style-type: none"> <li>• Works closely with the gateway community of Estes Park on transportation matters.</li> <li>• Currently working with the Western Transportation Institute, CDOT, and Town of Estes Park on the pilot ITS.</li> <li>• Works with the U.S. Forest Service on transportation matters.</li> <li>• Substantial funding from the Federal Transit Agency, Paul S. Sarbanes Transit in Parks (TRIP) program.</li> <li>• NPS Transportation Scholars program</li> </ul>	
Rocky Mountain Nature Association	ROMO has one of the largest volunteer program in the National Park Service, the park benefits from the efforts of approximately 1,700 volunteers every year. (NPS.gov/romo/)

## CLIMATE CHANGE .....

Founded in 2003, the NPS Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Rocky Mountain National Park obtained CFP certification and developed a Climate Change Action Plan that outlines strategies, including transportation management, to meet the park's mitigation goals.

### Transportation Related Strategies from Climate Change Action Plan

Strategy 1	Reduce Fuel Use and GHG emissions from park facilities and operations
Transportation Management (TM) emission reduction goal	Reduce transportation emissions by 469 MTCE (17%) below 2005 levels by 2017
TM Planned Action 1	Reduce Visitor Vehicles Miles Traveled (VMT) (develop and expand the shuttle system, develop a pricing structure for vehicles entering the park)
TM Planned Action 2	Replace existing park, concessionaire, and other vehicles with alternative fuel vehicles and hybrids (replace 50% of gasoline cars/trucks and diesel vehicles with best available technology, and more)
TM Planned Action 3	Work with partners to improve efficiency of transportation systems (in-crease shuttle capacity from Estes Park, work with surrounding Front Range communities, partner with county commissions)

(Rocky Mountain National Park Action Plan, September 2007)



.....PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

**VISITOR EXPERIENCE**

- Congestion and Parking
  - Parking lots at popular trailheads and popular visitor destinations fill early in the morning.
  - Traffic congestion occurs as visitors circulate looking for or waiting for a parking space.
  - Some congestion addressed with a “Hiker Shuttle” from the gateway community of Estes Park.
  - Crowding on trails and at popular destinations like Bear Lake served by transit where parking capacity formerly limited use.
  - Bear Lake Shuttle operates at a high capacity during peak hours of the day/week.
  - There is an emphasis to attempt to distribute visitors more evenly throughout the park. Trail Ridge Road is not conducive to shuttle service.
  - Noise created by diesel-powered buses.
- ITS and Communications
  - Currently conducting an ITS pilot study.
  - Pilot ITS currently in place for a short time. Information gleaned from the pilot project and additional research proposed for FY12 will be used to design an ITS for the park and gateway community of Estes Park.
- Helpful Transportation Investments
  - Multi-million dollar road improvements completed within last 6 years.
  - New trailhead parking areas and shuttle bus stops with shelters on Bear Lake Road.
  - Three accessible trails.
  - All new trailhead kiosks and bulletin boards throughout the park.
  - New entrance stations with Fast-Pass lanes at Beaver Meadows and Grand Lake entrances.
  - Hiker shuttle to/from Estes Park and Rocky Mountain National Park.
  - Modern fleet of shuttle buses.

**RESOURCE PROTECTION**

- Transportation Resource Impacts
  - Shuttle system exacerbates resource impacts at popular hiking destinations, including expansion of social trails.
  - Volunteer group manages traffic at an important bighorn sheep crossing.
  - Accidents involving large mammals (primarily elk and deer).
  - Planning is underway to look at strategies to manage visitor use. None are in place at this time.
- Key Resources
  - Dramatic scenery, wildlife, opportunities for outdoor recreation such as hiking, fishing, photography, horseback riding, cross country skiing, snowshoeing, backpacking, technical rock climbing, and camping.
  - Opportunities for solitude (95% of the park is designated wilderness).
  - Shuttle service allows increased visitation to popular destinations which creates crowding and reduced opportunities for solitude.
  - Buses generate air pollution and noise (diesel power).

**SUSTAINABLE OPERATIONS**

- Sustainability
  - The roadway assets are deteriorating much faster than they can be maintained. Deferred maintenance is a significant future problem for the park.

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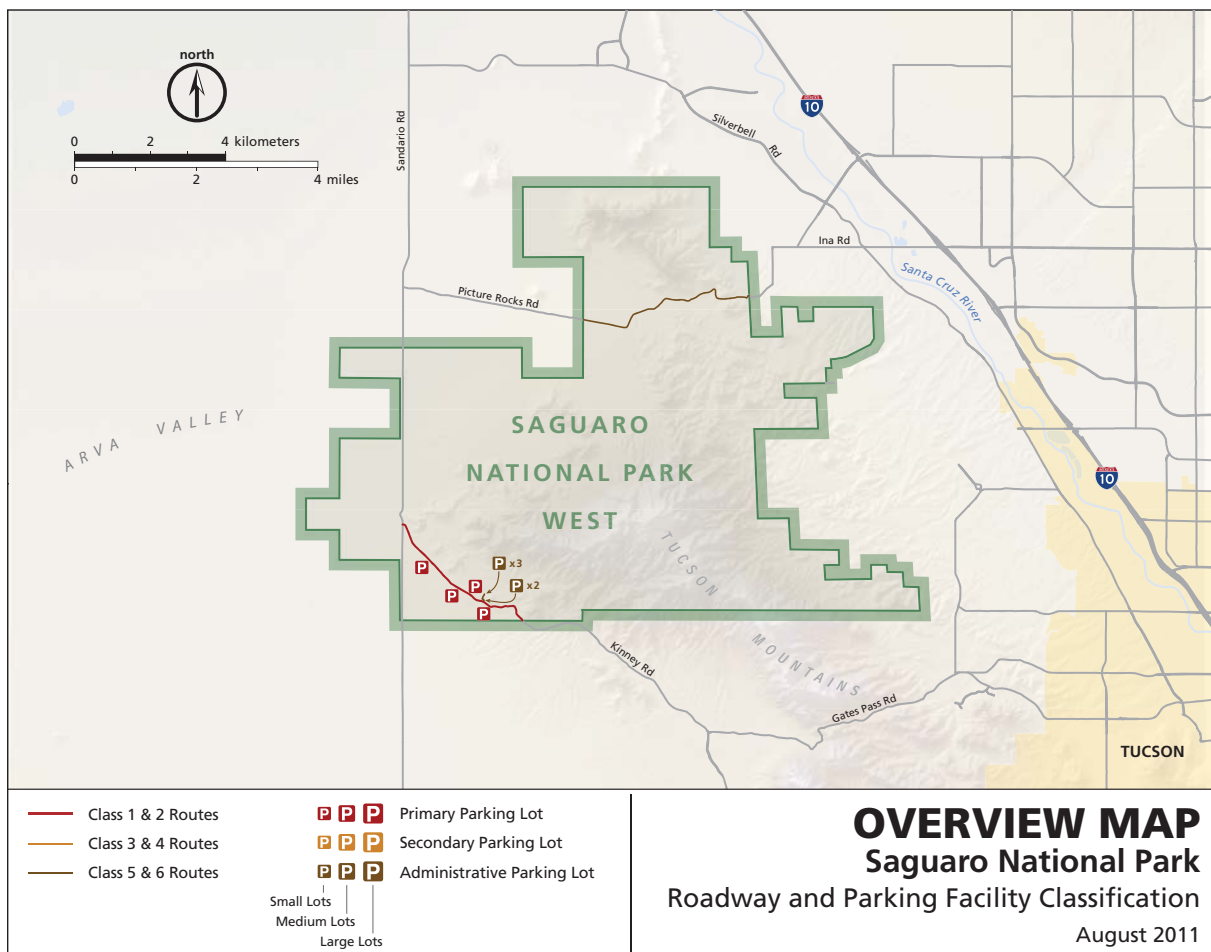
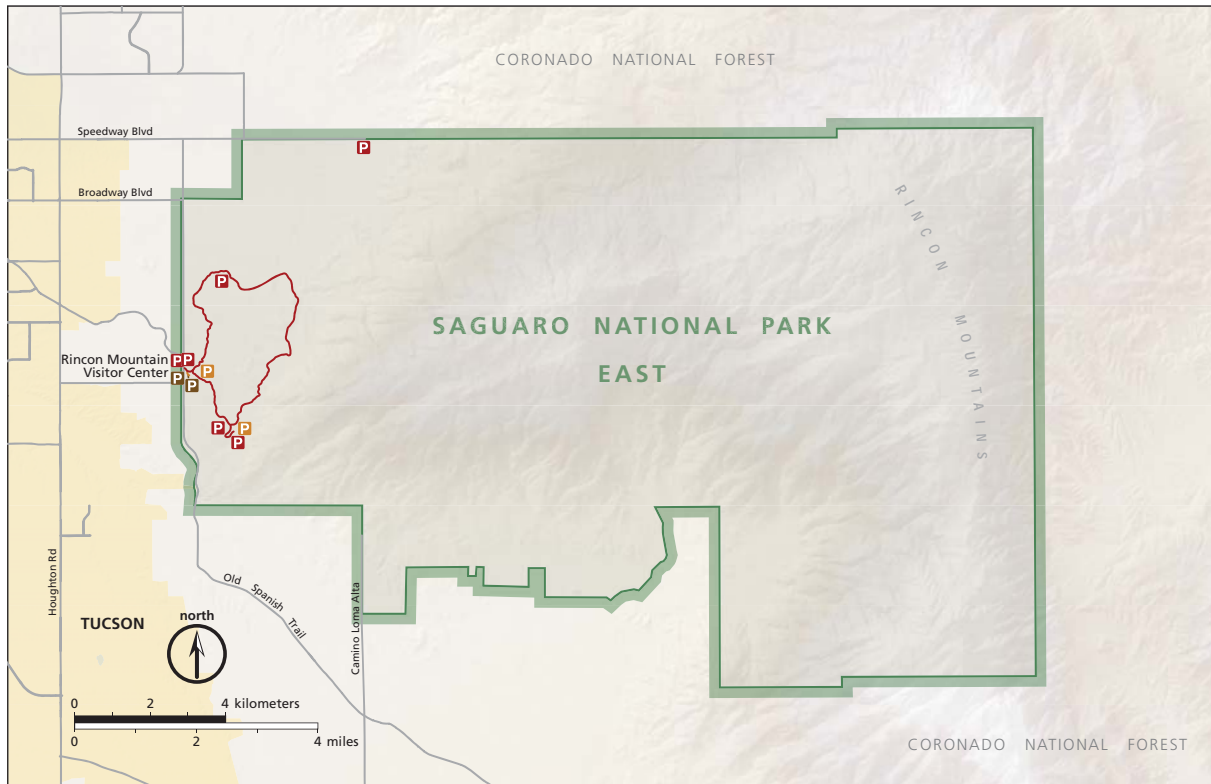
# Saguaro National Park

(SAGU)



SAGU

**INTERMOUNTAIN REGION**  
**LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT**



# SAGUARO NATIONAL PARK (SAGU)

## AT A GLANCE

**STATE:** Arizona    **SIZE:** 143 square miles    **TYPE:** Outlying

ROADWAY/PARKING CONDITION (CYCLE 4)					Asset Management	
	PCR	DM	Lane Miles	Area/Spaces		
Roadways	85 / GOOD	\$6.4 Million	23	–		
Parking	70 / FAIR	\$0.6 Million	–	184,000 SF / 300		
Replacement Value of All Transportation Assets			\$42.2 Million			
					Mobility, Access, & Connectivity	
CONGESTED AREAS			ALTERNATIVE TRANSPORTATION SYSTEM			
<ul style="list-style-type: none"><li>• Park Access Roadways</li><li>• Park Entrance Stations</li><li>• Trailheads</li></ul>			Annual Boardings	no transit		
			Fuel Type	not applicable		
			FEES			
			Transportation Fee	no		
			FLREA (% retention)	100%		
					Visitor Experience	
VISITATION (2010)			VISITOR EXPERIENCE QUALITY SCORE			
Total Visitors	3,000,000*		Roads	Parking		Date
Non-Recreation Visitors	283,000		–	–		no survey
Recreation Visitors	718,000		(University of Idaho Survey)			
10-Year Trend	-9.8%		TOP ACTIVITIES			
<p>*possible count inconsistencies due to methods/equipment</p>			<ul style="list-style-type: none"><li>• Sightseeing/scenic drive</li><li>• Photography</li><li>• Cycling</li><li>• Hiking</li></ul>			
					Resource Protection	
AT-RISK RESOURCES			TRANSPORTATION/RESOURCE ISSUES			
<ul style="list-style-type: none"><li>• Scenic landscapes</li><li>• Air quality</li><li>• Wildlife</li><li>• Cultural resources</li><li>• Rare plants/poaching</li></ul>			<ul style="list-style-type: none"><li>• Desert tortoise mortality on roads</li><li>• Unauthorized parking</li><li>• Social trails</li></ul>			
			Air Quality Status			Monitored*
			*See page 67			
					Sustainable Operations	
KEY PARTNERS			Climate Friendly Park Status			GHG Baseline
<ul style="list-style-type: none"><li>• Pima Association of Governments (MPO)</li><li>• City and County of Tucson</li><li>• Friends of Saguaro NP</li><li>• ADOT/Pima District</li></ul>			Green House Gas Emissions			1,817 Metric Tons
						(CLIP)

SAGU

### Key Transportation Findings and Challenges

<b>Asset Management</b>	<p>100% of Class 1 &amp; 2 roadway lane miles are in Good or Fair condition, with an improvement in overall PCR from 37 (Cycle 3) to 85 (Cycle 5).</p> <p>Public parking area PCR decreased from 83 (Cycle 3) to 72 (Cycle 5).</p> <p>\$7.0 million in deferred maintenance of transportation assets seems compatible with the roadway and parking assets conditions. SAGU has 6 lane miles of Class 7 &amp; 8 roads, also classified as city streets.</p>
<b>Mobility, Access, &amp; Connectivity</b>	<p>200 injury crashes between 1990 and 2005; higher rate than most parks; 44% of all crashes occurred on Route 11 (Picture Rock Road); 48% occur at night on the curvy sections of Route 11.</p> <p>The gap in service by the City of Tucson's transit system, which does not serve the park, leaves an underserved population without reliable park access, except by private vehicle. Those without vehicles include ethnic minorities, low income families, and urban residents, all of which are potential new visitors. The park would like to encourage the Tucson municipal system to extend service a short distance to reach the park.</p> <p>Bicycle use is heavy throughout the park, including regular bike tours. While cycling in the park is a popular activity, the narrow roads and tight turns present a conflict with motorized vehicles.</p> <p>Many commuters use park roads for access between the City of Tucson and surrounding, rapidly growing suburban areas. The higher speeds are incompatible with resource protection goals, especially collisions with endangered species and other wildlife. Closer ties with the City would help improve planning and identify potential issues before they become problems.</p>
<b>Visitor Experience</b>	<p>2010 Recreation Visitation was 717,614 (Medium).</p> <p>Recreational visitation dropped 0.1% annually 2001-2010.</p> <p>Parking congestion is a major problem with horse trailers and large vehicles consuming additional space, causing visitors to park in undesignated areas.</p> <p>Large amount of non-recreation traffic reduces the visitor experience and degrades park infrastructure; 76% of all traffic is non-recreation, although highly variable year to year.</p> <p>Non-recreation visitation declined 1.4% per year 2001-2010.</p> <p>Visitation is generally uniform throughout the year, in contrast to many outlying parks that peak heavily during summer months.</p> <p>Congested locations identified on park access roads, entrance stations and trailheads.</p>
<b>Resource Protection</b>	<p>High speed traffic on through routes (Picture Rock Road and Sandaria Road) is especially problematic for the endangered desert tortoise. Vehicle collisions resulting in death for smaller fauna are seldom reported, and are having a significant effect on the tortoise.</p> <p>Poaching and disturbance of native plants, including the namesake Saguaro, along county road adjacent to park boundary.</p> <p>Unauthorized parking contributes to social trailing, compaction of soils, and damage to vegetation.</p> <p>30% of roadway lane miles are designated as historic.</p>
<b>Sustainable Operations</b>	<p>Climate Friendly Park certification in process.</p> <p>Climate change contributing to risks associated with drought, native plants and animals, wildfire, and invasive species.</p> <p>Good relationship of park with county (maintenance agreement) and friends group who raises funds through corporate and individual sources.</p>



## MISSION

The mission of Saguaro National Park emphasizes:

- The preservation of Saguaro Cacti
- The preservation of the Sonoran Desert
- To provide for scientific research
- The protection of the many plants and animals found therein
- To provide for enjoyment of visitors
- The preservation and promotion wilderness places and values
- The education of the public about its natural and human history

## PARK DESCRIPTION

Saguaro National Park features the iconic Giant Saguaro cactus that symbolizes the American West. It has two districts separated by approximately 30 miles on each side of the City of Tucson. These districts are the Tucson Mountain District (Saguaro West), and the Rincon Mountain District (Saguaro East).

The Tucson Mountain District of Saguaro National Park ranges from an elevation of 2,180 feet to 4,687 feet and contains two biotic communities: desert scrub, and desert grassland. Average annual precipitation is approximately 10.27 in. Common wildlife includes the coyote, Gambel's quail, and desert tortoise.

The Rincon Mountain District of the park ranges from an elevation of 2,670 feet to 8,666 feet and contains six biotic communities. The biotic communities (starting from the lowest elevation) include desert scrub, desert grassland, oak woodland, pine-oak woodland, pine forest and mixed conifer forest. Average annual precipitation is approximately 12.30 in. The Rincon Mountain District contains the 57,930-acre Saguaro Wilderness Area, which was officially designated as wilderness in 1976. It is a roadless backcountry area where backcountry camping is available by permit. The Rincon Mountains peak at a considerably higher elevation than the Tucson Mountains; therefore, there are more biotic communities and increased plant and wildlife diversity.

## PARK LOCATION

Saguaro National Park is located in Arizona and has several park entrances. Interstates 10 and 19 (I-10 and I-19) are the primary regional interstates through Tucson and I-10 links local roads to the entrances of both park districts.

The Red Hill Visitor Center is at the southern entry of the Tucson Mountain District (Saguaro West) and is access from Kinney Road off SH 86. The northern entry to the Tucson Mountain District is accessed from Picture Rocks Road. The main park roads within the Tucson Mountain District are Hohokam Road and Golden Gate Road.

The Rincon Mountain District Visitor Center can be accessed from Tucson's Old Spanish Trail road or Houghton Road/Escalante Road off I-10. The main park road within the Rincon Mountain District is Cactus Forest Road.

The park is located approximately 120 miles from Phoenix, AZ, 410 miles from Las Vegas, NV, and 490 miles from Los Angeles, CA.



Nearby National Park Service units include:

- Organ Pipe Cactus National Monument (100 miles)
- Petrified Forest National Park (270 miles)
- Grand Canyon National Park – South Rim (335 miles)
- White Sands National Monument (355 miles)

## **TRANSPORTATION OVERVIEW**

Saguaro National Park contains 23 roadway lane miles and 184,000 square feet of parking infrastructure. Tucson International Airport lies 25 miles southeast of the Tucson Mountain District (Saguaro West) and 15 miles west of the Rincon Mountain District (Saguaro East).

Saguaro National Park consists of two Districts on the east and west sides of the City of Tucson. Access between the two Districts is accomplished by using City of Tucson streets, primarily Speedway Boulevard, Gates Pass Road and Kinney Road. Both Districts contain a roadway which circulates traffic to facilities, trailheads, and parking lots. Trails can be accessed from the main park roadway or from trails outside of the park.

The primary entrance for the Rincon Mountain District is from Old Spanish Trail. This entrance provides access to Cactus Forest Drive (portions are one-way) which circulate traffic in a small loop on the west side of the District.

The primary entrance for the Tucson Mountain District is on Kinney Road. This entrance provides access to the unpaved Bajada Loop Drive and Golden Gate Road. Picture Rocks Road and Sandario Road are maintained by the City and account for many non-recreation trips, mostly by regional commuters, through the park. Heavy residential and other suburban development has turned what were once scenic and leisurely roads into high speed corridors that endanger wildlife and substantially impact the visitor experience for those who wish a more leisurely pace. The poor availability of non-NPS roads to provide suitable east-west connectivity continues to direct growing numbers of vehicles to cross the park environment making it difficult, if not impossible, to continue to meet the Park's base mission. This issue points to the need to assertively participate in regional planning activities in order to identify problems before they become critical.

## ASSET MANAGEMENT

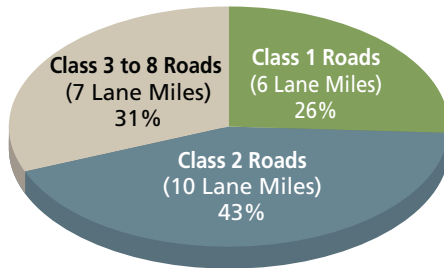
The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Saguaro National Park transportation assets is \$42.2 million.

### Saguaro National Park Roadway and Parking Assets

- The roadway network consists of approximately 23 lane miles on 11 different routes.
- Approximately 184,000 square feet (300 spaces) of parking area provided.
- 16 lane miles are identified as Class 1 or 2 roads.

### ROADWAY ASSETS

TOTAL LANE MILES = 23



Since the park is located in an urban area, the proportion of park roads classified as Class 3 to 8 is higher than other focus parks. This classification indicates less predominate roadways and city streets, in this case, Picture Rocks and Sandario Road. These roads account for the high volume of through traffic within the Tucson Mountain District. The majority of roads in the park, however, are Class 1 or 2.

### ROADWAY PAVEMENT CONDITION RATING (PCR)

Roadway Type	Average PCR*
All Roadways	85 - GOOD
Class 1	79 - FAIR
Class 2	93 - GOOD
Class 3 to 8	73 - FAIR

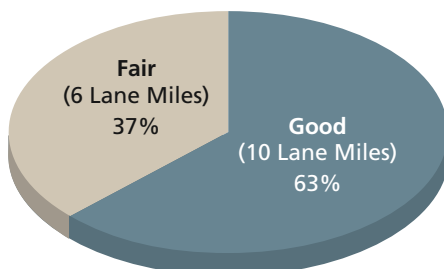
\*Cycle 5 RIP data

The average condition for roadways in the park is good. Class 2 roadways are in good condition, while all other roadway classes have an average condition of fair.

SAGU

### CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

TOTAL LANE MILES = 16

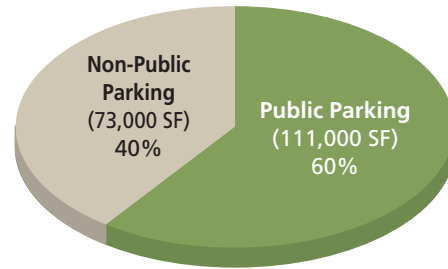


Two-thirds of Class 1 & 2 roadway miles are in good condition, while the remaining third are in fair condition. The average PCR rating for Class 1 roadways is 79 (fair) and 93 (good) for Class 2 roadways.

## PARKING ASSETS

Approximately 184,000 square feet (300 spaces) of parking is provided in 19 identified parking areas. Just over half of Saguaro National Park parking areas is considered public in nature, approximately 180 spaces. the remaining parking is classified as non-public (120 spaces). Compared to other focus parks, this proportion of non-public parking is considerably higher. This may be a result of the two separate districts.

**TOTAL SQUARE FEET = 184,000**



## PARKING PAVEMENT CONDITION RATING (PCR)

Parking lots within the park have a degraded average condition compared to roadways.

Parking Type	Average PCR*
Public Parking	72 - FAIR
Non-Public Parking	68 - FAIR
All Parking	70 - FAIR

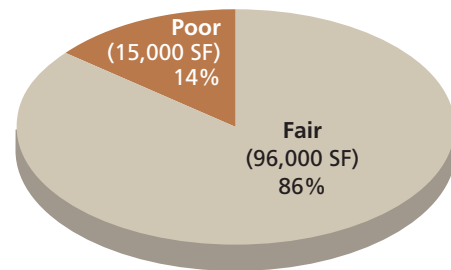
\*Cycle 5 RIP data

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

A large majority of public parking areas within Saguaro National Park is in fair condition. However, two parking assets, Douglas Springs Trailhead and Wildlife Waterhole, have poor pavement conditions.

Park wide, public parking areas provide approximately 96,000 square feet (160 spaces) rated in fair condition. The remainder of parking, 15,000 square feet (20 spaces), are in poor condition.

**TOTAL SQUARE FEET = 111,000**



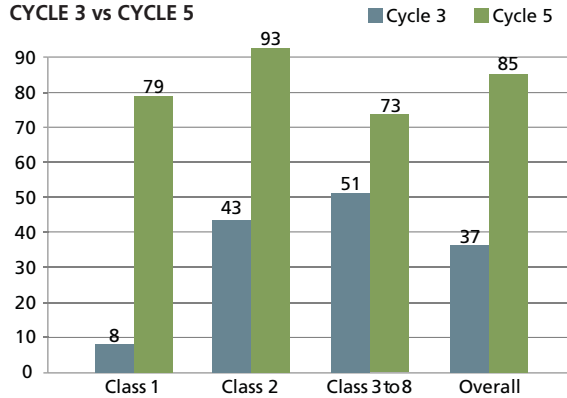
## ASSET CONDITIONS OVER TIME

The most recent cycle of RIP data available for Saguaro roadways and parking is Cycle 5. A comparison of Cycle 3 and Cycle 5 asset data provides a snapshot of the conditions of Saguaro National Park assets over time. Between 2006 and 2012, the roadway pavement conditions within the park improved from 37 to 85. The parking pavement conditions degraded from 86 to 70.

### ROADWAY ASSETS

#### ROADWAY CONDITIONS

CYCLE 3 vs CYCLE 5

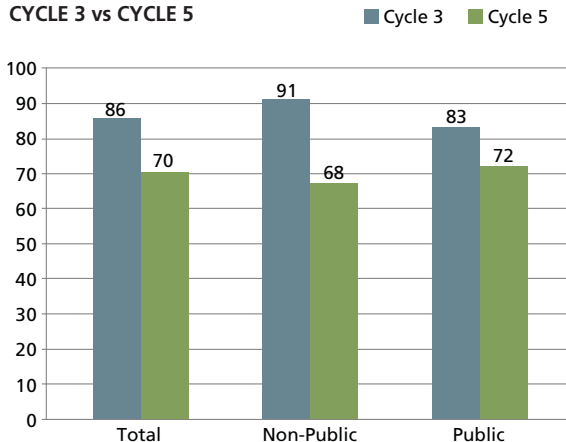


Roadway average conditions have improved significantly from Cycle 3 to Cycle 5. Overall, average conditions for the park have improved to good. The Class 2 average condition has improved to good, while other classifications have improved to an average condition of fair.

### PARKING ASSETS

#### PARKING CONDITIONS

CYCLE 3 vs CYCLE 5



Public and non-public parking areas have both degraded in average condition from Cycle 3 to Cycle 5. All parking areas have an average condition of fair.

## TRANSPORTATION TRAILS

The Park does not contain any transportation trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities."

## BRIDGE AND TUNNEL ASSETS

Saguaro National Park does not contain bridge or tunnel assets.

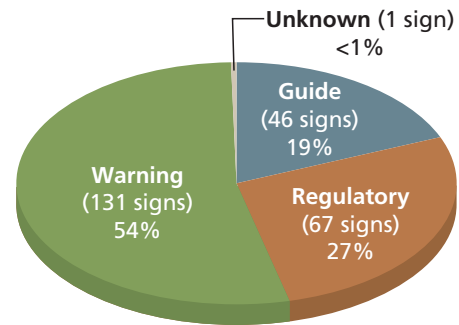
## TRANSPORTATION SIGN ASSETS

Saguaro National Park roadways and parking areas contain 245 transportation signs. Approximately 19 percent of the signs are guide signs meant to direct visitors to the desired destinations. This is a substantially lower proportion of guide signs compared to other focus parks. Eighty-one percent of the signs are regulatory and warning signs. The proportion of warning signs in Saguaro National Park is substantially higher than other focus parks. One sign has an unknown type since the sign is either missing or unreadable.

Condition	Quantity
Good	244
Fair	0
Poor	0

### Sign Asset Quantity and Condition

TOTAL SIGNS = 245

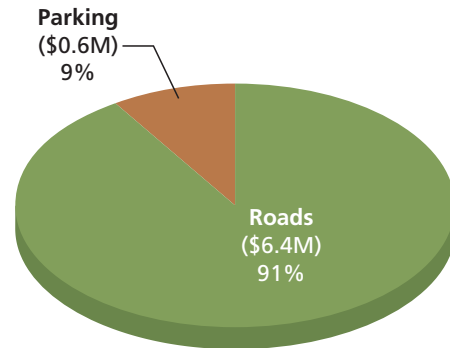


## DEFERRED ASSET MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- The calculated deferred maintenance costs within Saguaro National Park equal approximately \$7.0 million.
- The majority of deferred maintenance is associated with Park roadways.
- Previous Cycle 3 data included \$2.2 million of deferred maintenance for trails. Comparable trails data was not provided for Cycle 4/5.

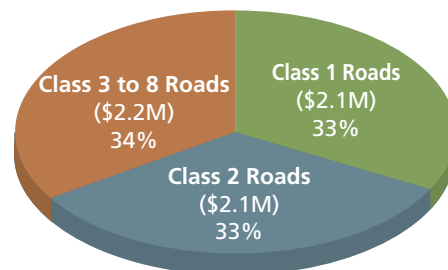
TOTAL DEFERRED MAINTENANCE = \$7.0M



## DEFERRED ROADWAY MAINTENANCE

Deferred maintenance is distributed evenly across all roadway classifications. Class 1 and Class 2 roadways each constitute approximately 33 percent of roadway deferred maintenance. The remaining third is associated with Classes 3 to 8.

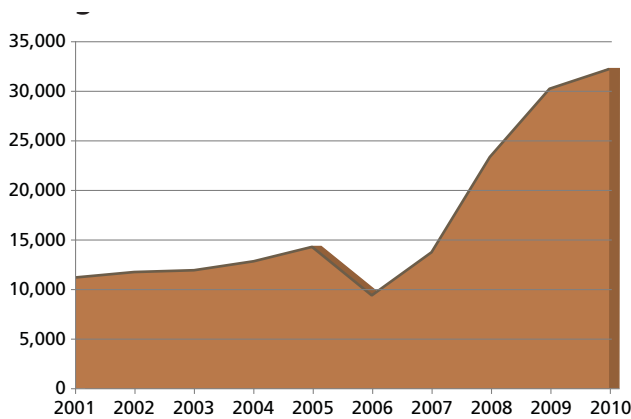
TOTAL DEFERRED MAINTENANCE = \$6.4M



## MOBILITY, ACCESS AND CONNECTIVITY

### ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

Annual Pedestrian Volume



Saguaro National Park does not provide ATS services within the park. The park is not directly served by the City of Tucson's Sun Tran system. Existing Sun Tran routes do not reach the park entrance, leaving a gap in service for potential visitors.

### MULTI-MODAL CONNECTIVITY

The park is accessible by foot and bicycle. The park estimates the number of pedestrians that access the park on a monthly basis to use trails and other park facilities. In recent years, the park has experienced a rapid increase in pedestrian visitors. Pedestrian volume has tripled in the last four years.

Tucson is recognized as a bike friendly city, and the park staff has a good relationship with Tucson's bicycle coordinator. There is a year-round, high use of Saguaro National Park by an active bicycling population. Bicyclists are allowed on park roads, which are narrow and include blind corners and dips. In the east district, bicycles are also allowed on the 2.8 mile Hope Camp Trail, which is expected to complete a popular bicycle loop on the east side of Tucson. Bicycle tours are available in the park.

### TUCSON INTERNATIONAL AIRPORT

Tucson International is owned and operated by the Tucson Airport Authority, and lies on the south side of the City. The Tucson Airport Authority also owns and operates Ryan Airfield and which is 10 miles southwest of Tucson.

Tucson International Airport is 25 miles southeast of the Tucson Mountain District and 15 miles west of the Rincon Mountain District. Tucson International Airport covers an area of 8,244 acres.

### SCENIC BYWAYS

HWY #	DESIGNATION	SCENIC BYWAY
Catalina HWY	State, NSB, NFSB	Sky Island Scenic Byway
NSB = National Scenic Byway, NFSB = National Forest Scenic Byway, State = State Scenic Byway		



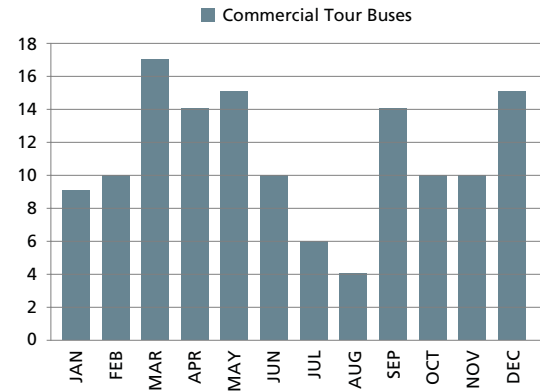
## CONGESTION

The number of vehicles entering Saguaro National Park decreased by about 3 percent annually from 2002 to 2010. The peak visitation month in 2010 was March. Saguaro National Park welcomes approximately 3,980 vehicles on a peak visitation day.

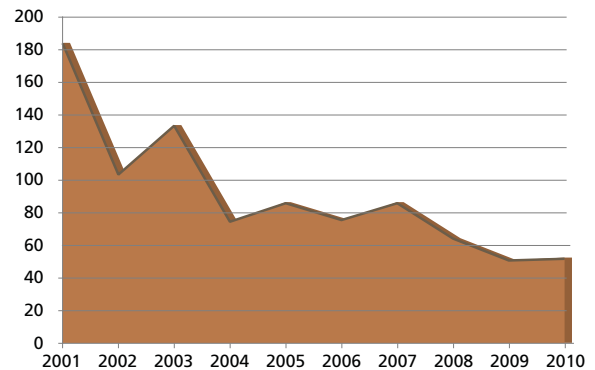
During peak season, fewer than 20 buses enter Saguaro National Park in a month. The park does not track the number of RVs that enter the park on a monthly basis. The number of buses entering the park on an annual basis decreased since 2001 with fewer than 100 buses entering the park on an annual basis.

During peak season, 17 commercial tour buses visit Saguaro National Park in a month. The total Annual number of buses has declined.

Commercial Tour Bus and RV Vehicles



Annual Commercial Tour Bus Volumes



## CONGESTION LOCATIONS

As part of the 2010 Service-wide Congestion Management System (CMS) survey Saguaro National Park identified several congested locations within the park.

Congested Areas	Locations Identified
Park Access Roads	Picture Rocks Road Old Spanish Trail
Park Entrance Stations	Cactus Forest Loop Drive – Rincon Mountain Entrance
Trailheads	Douglas Springs Broadway Wildhorse

## CONGESTION MITIGATION STRATEGIES

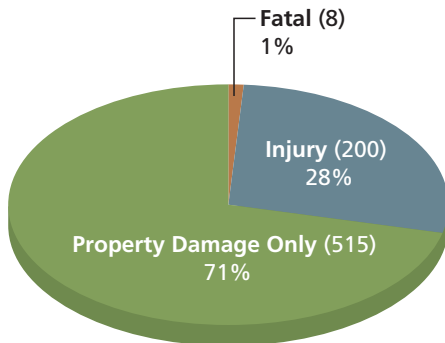
Park staff did not identify operations/mobility mitigation strategies used within the park in the 2010 Service-wide CMS survey.

## ITS STRATEGIES

Multimedia information including eTours (Quicktime VR panoramic videos) and Podcasts offer visitors a virtual trip through the park's features and attractions to aid in trip planning.

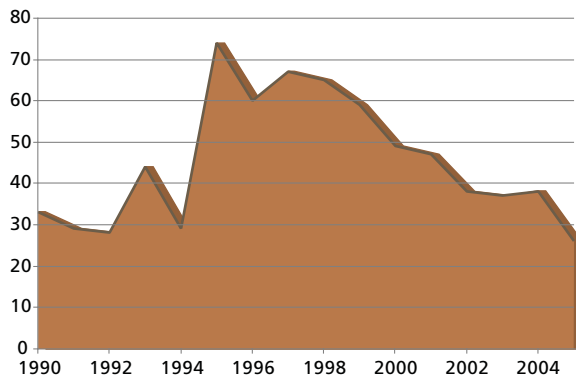
## CRASH SEVERITY

TOTAL CRASHES = 723



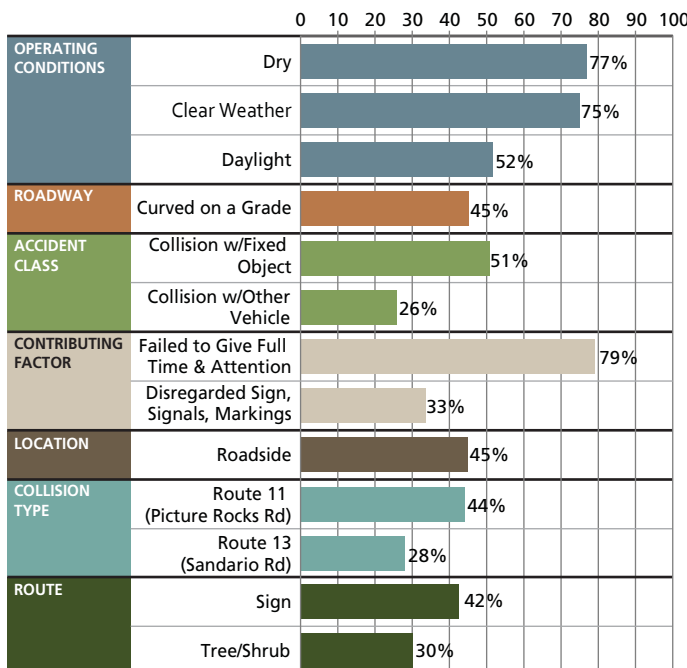
Saguaro National Park experienced 723 crashes between 1990 and 2005. As with most parks the majority were property damage only (PDO), but Saguaro National Park experienced a larger proportion of injury related crashes than an average park in the IMR. One fatal crash occurred during the same time period.

## ANNUAL CRASHES



Saguaro National Park averages approximately 45 crashes a year. From 1995 to 2005, the park experienced an annual decrease in crashes of approximately 10.7 percent per year, indicating increasing safety over time. The crash rates within Saguaro National Park were identified as higher than expected in the Intermountain Region Crash Data Summary compared to crash rates for similar locations in Arizona. The rate of injury and fatal crashes is substantially higher than state and IMR averages as well.

## CRASH CONDITIONS



A majority of crashes in Saguaro National Park occur during daylight and dry conditions. However, 48 percent of crashes occur outside of daylight hours, which is substantially higher than other focus parks. This may indicate poor visibility during dusk and nighttime hours. Primary crash locations are curved sections of roadway. Driver inattention is the primary contributing factor indicated for approximately 52 percent of the crashes. Most crashes occur on either Picture Rocks Road or Sandario Road. Over three-quarters of crashes are collisions with fixed objects and other vehicles. Taken together, the crash data indicated that drivers may have difficulty maneuvering curved sections of roadway at night and result in hitting roadside objects or other vehicles.

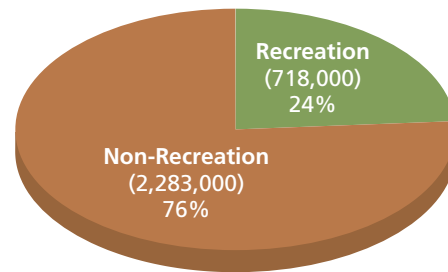
## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information NPS collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Saguaro National Park.

### 2010 VISITATION

Saguaro National Park had approximately 3,000,000 visitors in 2010. Of these, approximately 76 percent of those visitations were non-recreation in nature. Most of these non-recreation trips were from through traffic on Picture Rocks Road, Kinney Road, and Sandario Road which serve local traffic in the Tucson metropolitan area.

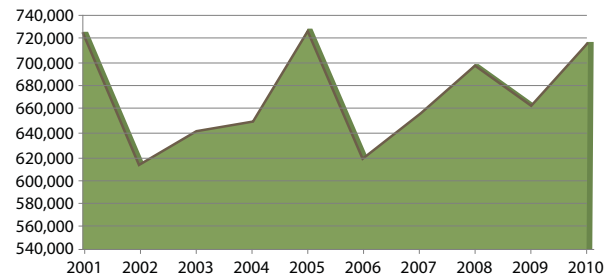
**2010 Visitation**  
**TOTAL VISITORS = 3,000,000**



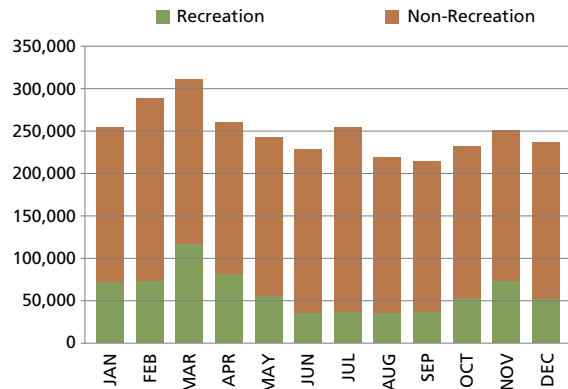
### 2010 ANNUAL VISITATION

Recreational visitation was highly variable from 2001 to 2010, varying by almost 100,000 visitors per year. From 2000 to 2010, Saguaro National Park visitation decreased by about 1.2 percent per year, but it has increased most years since 2006. Non-recreation trips have also been decreasing by about 1.4 percent per year over the same time period.

**Recreation Visitation 2001-2010**



**Visitors By Month**



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## VISITOR ACTIVITIES

No survey data is available to quantify the activities of visitors within Saguaro National Park. The main activities available for visitors to participate in include scenic driving, hiking, picnicking and biking activities. Backcountry camping is available by permit in the Saguaro National Park Wilderness Area. The Signal Hill Picnic Area in the Tucson Mountain District offers views of ancient petroglyphs. In the Rincon Mountain District the Freeman Homestead Trail educates hikers about homesteading in the desert as well as modern Tucson. The Manning Cabin is visited by those who trek into the Saguaro National Park Wilderness Area.

## VISITOR SERVICES USED

Survey data detailing visitor services used is not available for Saguaro National Park. Multimedia information including Podcasts and Quicktime VR panoramic videos can be used before visits. Once in the park, visitors can enjoy cultural resource programs such as the daily orientation program at the Red Hills Visitor Center which features a Native American perspective on the saguaro cactus. Horseback riding opportunities are available. A variety of guided walks and interpretive programs are offered in the busy winter season from November through March. Interpretive programs are offered intermittently during the late spring and summer months.

## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- No VSP found on record
- 2010 CMS Survey
  - Congested locations: park access roadways, park entrance stations, trailheads
  - Strategies: did not identify strategies
- Surveys & Interviews, 2011
  - Congested locations: parking areas (Rincon Mt. District Visitor Center and several major trailheads)
  - Strategies: Improvements to Cactus Loop Drive, AZ Trail through the park, and Esperanza Trailhead parking area

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in Saguaro National Park.

### AIR QUALITY AND GHG EMISSIONS

The park is located near multiple nonattainment areas, as shown in the adjacent table.

Nonattainment Area	Criteria Air Pollutant and Status
Pinal County, AZ	8 Hour Ozone - Marginal PM 10 - Moderate/Serious PM 2.5 - Non-attainment Sulfur Dioxide – primary
Pima County, AZ	PM-10 – Moderate
Santa Cruz County, AZ	PM-10 – Moderate PM-2.5 - Nonattainment

The park had completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

#### Mobile GHG Emissions

Park Operations (MTCO <sub>2</sub> E)	228.3
Visitors (MTCO <sub>2</sub> E)	1817.2
Concessionaires (MTCO <sub>2</sub> E)	0.0
Total Mobile GHG Emissions	1817.2

*Climate Leadership In Parks*

### SIGNIFICANT RESOURCES

The purpose of Saguaro National Park is to:

- preserve, protect, and interpret the Sonoran Desert and associated mountain ecosystems, and archeological and historical sites and artifacts.
- provide for public enjoyment of these resources.
- preserve and maintain wilderness areas and values.
- acknowledge the inherent long-term scientific interest in the natural and cultural resources.

The primary significance of Saguaro National Park can be stated:

The park contains superb examples of the Sonoran Desert ecosystem, featuring exceptional stands of saguaro cacti, important wildlife habitat, the associated mountains, and significant cultural resources, including National Register eligible archeological resources, American Indian cultural traditions, and historic period structures.

..... **THREATENED & ENDANGERED SPECIES**

Common Name	Species Name	Listing Category	Status in Park
Cactus Ferruginous Pygmy-Owl	Glaucidium brasilianum cactorum	Delisted	Current
American Peregrine Falcon	Falco peregrinus anatum	Delisted Monitored	Current
Lesser Long-nosed Bat	Leptonycteris curasoae yerbabuenae	Endangered	Current
Mexican Spotted Owl	Strix occidentalis lucida	Threatened	Current
Western Yellow-billed Cuckoo	Coccyzus americanus occidentalis	Candidate	Current
Brown Bear	Ursus arctos	Threatened	Historic
Gila Topminnow	Poeciliopsis occidentalis	Endangered	Historic
Gray Wolf	Canis lupus	Endangered	Historic
Jaguar	Panthera onca	Endangered	Historic

There are no plant species currently listed as threatened or endangered, or are there candidates for threatened or endangered status.

### SAGUARO NATIONAL PARK TRANSPORTATION HIGHLIGHT

The desert tortoise is a common but often unseen resident of Saguaro National Park. They spend a majority of their lives in burrows where they escape cold winter temperatures and extreme summer heat. The dangers arise when the tortoises leave their burrows. The urban streets that surround the districts of Saguaro National Park represent the largest threat to the tortoise population, especially in the Tucson Mountain District. Streets such as Picture Rocks Road, Kinney Road, and Sandario Road carry thousands of vehicles a day at high speeds. These streets cross desert tortoise habitat and create barriers that the tortoises must cross to find food and water.

Each year it is estimated that hundreds, if not thousands of tortoises, are killed on area roadways. Many times these crashes are not reported and thus are not indicated as part of the crash records within Saguaro National Park. It is illegal to handle desert tortoises except when they are on a roadway. Visitors are encouraged to gently pick up tortoises and remove them from the roadway.

The impacts to habitat (deaths of tortoises), noise levels, and safety from heavy, high speed commuting traffic point to a need for greater park involvement in local planning processes.



## SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Saguaro National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

### REGIONAL AND COMMUNITY STAKEHOLDERS

The City of Tucson is located between the two districts of Saguaro National Park. Access between the two districts is provided by urban streets in the Tucson Metropolitan area. The urban nature of the park introduces a high volume of non-recreation visitation to park roadways. The Rincon Mountain district is bordered by the Coronado National Forest, managed by the National Forest Service. The Tucson Mountain district is located near the Ironwood Forest National Monument managed by the BLM as well as the Tohono O'odham Indian Reservation.

Regional MPOs and Governments	PAG – Pima Association of Governments (Tucson MPO) Tucson County – Tucson Mountain Park
Coronado National Forest	Coronado National Forest
US Bureau of Land Management	Ironwood Forest National Monument
ADOT	Interstate 10
Indian Nations	Papago

### TRANSPORTATION RELATED PARTNERSHIPS

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

#### Existing Partnerships

Community Partnerships	<ul style="list-style-type: none"> <li>• Participating in Imagine Tucson (IT), the latest regional planning initiative.</li> <li>• Good relationship with the county who maintains some areas of roadway in the park.</li> <li>• Friends group raises money for the park thru corporate and individual funding.</li> <li>• Share people and resources with the USFS, BLM, and USFWS thru a Service First agreement.</li> <li>• Park recently coordinated completion of the AZ Trail with AZ Trails Association.</li> <li>• The population of the Tucson area is poorer than average; the Park would like a public transportation option to serve this population.</li> </ul>
Friends of Saguaro National Park	Volunteers at Saguaro National Park perform many of the functions that allow visitors to enjoy the park as well as many behind-the-scenes functions that are essential to maintaining the long term health of the park's resources.

..... **CLIMATE FRIENDLY PARKS**

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Saguaro National Park is currently working to obtain CFP certification.

..... **PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS**

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

**VISITOR EXPERIENCE**

- Parking
  - Parking is a major problem during the peak 90 day window for the park. Horse trailers and buses consume much needed parking spaces. When parking lots are full, visitors park in undesignated areas.
  - Parking at Rincon Mt. District Visitor Center and major trailheads is inadequate and unsafe.
  - Visitor Center parking outdated and not adequate for motor homes.
  - Horse trailers, cars and people are all mixed together, creating unsafe and inadequate parking.
  - No available space to increase the size of parking facilities.
  - The Park would prefer to purchase additional parking offsite, however NPS policy does not allow this.
- Congestion
  - Congestion during peak season, lack of public transportation for visitors and employees, trailhead parking and safety.
  - Rincon Mountain Visitor Center and office complex congested during peak visitation (Dec - Apr).
  - Approximately 9 miles of paved roads used extensively for bicycling.
  - Significant number of bicycles arrive via bike tours.
  - Picture Rock Road is a commuter route requiring extensive law enforcement patrols for speeding and DUI.
- Communications and ITS
  - Web site, social media updated regularly; hope to expand with apps and VC kiosk; enhanced website.
  - Several local communities employee ITS.
  - Need more virtual transportation and park planning; introduce map apps and visitor center computerized kiosk stations to provide tech-savvy users with adequate info.
- Helpful Transportation Improvements
  - Paving of the Cactus loop drive, completion of the AZ Trail through the Park, Completion of Esperanza Trailhead parking area.
  - Old Spanish Road is a County maintained road and needs improvements.

**RESOURCE PROTECTION**

- At Risk Resources
  - Lack of adequate trailhead parking results in road shoulder impacts and shortcuts to trailheads.
  - Vegetation and animal loss due to encounters with vehicles and bicycles.
  - Saguaro, the park's namesake, are at risk due to disturbance and poaching.

**SUSTAINABLE OPERATIONS**

- Climate Change
  - Potential impact threats to Saguaro, due to the increase of non-native invasive Buffelgrass.
  - Wildfire risk increased by invasive species.
  - Shuttle system could reduce impact of carbon footprint.

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# San Antonio Missions National Historical Park

(SAAN)



SAAN



INTERMOUNTAIN REGION  
LONG RANGE TRANSPORTATION PLAN: TRANSPORTATION IN CONTEXT



# SAN ANTONIO MISSIONS NATIONAL HISTORICAL PARK (SAAN)

## AT A GLANCE

**STATE:** Texas **SIZE:** 1 square mile **TYPE:** Suburban

### ROADWAY/PARKING CONDITION (CYCLE 4)

	PCR	DM	Lane Miles	Area/Spaces
Roadways	46 / POOR	\$0.1 Million	0.2	–
Parking	51 / POOR	\$1.3 Million	–	169,000 SF / 275
Replacement Value of All Transportation Assets			\$7.9 Million	

Asset Management

### CONGESTED AREAS

- Parking
- Periodic congestion associated with festivals and tours

### ALTERNATIVE TRANSPORTATION SYSTEM

Annual Boardings	no transit
Fuel Type	not applicable

### FEES

Transportation Fee	no
FLREA	no fee

Mobility, Access, & Connectivity

### VISITATION (2010)

Total Visitors	1,305,000
Non-Recreation Visitors	0
Recreation Visitors	1,305,000
10-Year Trend	-4.8%

### VISITOR EXPERIENCE QUALITY SCORE

Roads	Parking	Date
–	–	no survey

(University of Idaho Survey)

### TOP ACTIVITIES

- Historical interpretation
- Walking
- Photography

Visitor Experience

### AT-RISK RESOURCES

- Cultural resources/landscape
- Soundscape
- Anticipated drought/flood cycles

### TRANSPORTATION/RESOURCE ISSUES

- Social Trails
- Air traffic noise
- Vibration from train

Air Quality Status	Not Monitored/Regulated
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Resource Protection

### KEY PARTNERS

- Los Compadres
- San Antonio/Bexar County MPO
- San Antonio River Authority
- TxDOT/San Antonio District

Climate Friendly Park Status	In-process
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Green House Gas Emissions	2,616 Metric Tons
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(CLIP)

Sustainable Operations

SAAN

### Key Transportation Findings and Challenges

<b>Asset Management</b>	<p>Urban setting requires close cooperation with partners to solve complex transportation issues including parking and multimodal connectivity.</p> <p>Park maintains only about 250 public parking spaces of which 100% is in Poor condition.</p> <p>Existing parking is congested and heavily used by non-park visitors; while parking is often over capacity, funds cannot be used outside strict park boundaries.</p>
<b>Mobility, Access, &amp; Connectivity</b>	<p>The four missions that make up the park are non-contiguous units embedded in an urban fabric. There is inadequate and confusing wayfinding between the disconnected sites and the existing sidewalks and transit network do not provide continuous access.</p> <p>The urban park successfully participates in planning and partnering with local agencies, especially to improve the trail system that not only connects the various missions, but connects regionally with the rest of the metropolitan area.</p> <p>The park is also well-served by local transit, another example of good partnerships at work.</p> <p>Limited parking, primarily during special events, has a significant negative impact. Since little parking may be provided on NPS-managed property, continuing to look for expanded parking opportunities on adjacent properties continues to be a priority for the park.</p> <p>The confusing interrelationship of NPS properties and trails with local park areas and trails makes it difficult for visitors to understand the opportunities presented by the park. Better signage and wayfinding to go with the maturing trail system would greatly improve the visitor experience.</p>
<b>Visitor Experience</b>	<p>2010 Recreation Visitation 1,304,690 (Medium).</p> <p>Recreational visitation dropped 0.5% annually 2001-2010.</p> <p>No entrance fees charged for the approximately 1.3 M annual visitors.</p> <p>Large number of visitors must be managed for the many regularly scheduled large public events.</p>
<b>Resource Protection</b>	<p>Vibration from trucks and other vehicles very near to fragile adobe and stone cultural assets poses a very real immediate and long term threat to their structural integrity. Low frequency vibrations from a rail line near Mission San Juan affects long term structural stability of primary park resources.</p> <p>Large group visitation has potential impacts on fragile cultural resources and landscape. Additionally, large school groups delivered by school bus arrive at one time, impacting infrastructure and resources, particularly restroom facilities and parking.</p> <p>There are no historic roads or parking areas in the park.</p> <p>Several facilities have been tagged for potential decommissioning.</p> <p>Four eighteenth century Spanish missions and 850 acres of cultural landscapes have been set aside to preserve the largest concentration of Spanish Colonial Resources in the world.</p>
<b>Sustainable Operations</b>	<p>Park is active partner in wide-based community supported trail development that connects the four missions.</p> <p>The park doesn't control the majority of parking.</p> <p>Climate Friendly Park certification in process.</p> <p>Extreme weather events put sensitive structures at risk of soil movement.</p> <p>More than 40 buildings on the List of Classified Structures are very sensitive to the movement of soils caused by alternating wet and dry conditions.</p>

### MISSION

The mission of San Antonio Missions National Historical Park is to preserve, restore, and interpret the Spanish Missions of San Antonio, Texas, for the benefit and enjoyment of present and future generations of Americans.



## PARK DESCRIPTION

San Antonio Missions National Historical Park is located in south-central Texas just south of downtown San Antonio. It can be toured following the 14.7-mile north-south Mission Trail, which begins near The Alamo and San Antonio's Riverwalk along the San Antonio River. The Alamo Mission is one of the five original missions, but The Alamo is owned by the State of Texas. The four missions managed by the NPS include Mission Concepcion, Mission San Jose, Mission San Juan, and Mission Espada.

The history of this area began in the early 1700s with the Spanish settlement. Franciscans and Spanish representatives established the first mission in 1718 and within 13 years, five were located along the San Antonio River. Water from the river was diverted into eighteenth century acequias (irrigation ditches, still in operation) to serve the mission communities. Today, a wide, straight river channel is built where the once serpentine, flood-prone waters of the San Antonio River had run, but remnants of the old river channel still remain.

The four mission churches preserved within the San Antonio Missions National Historical Park are active catholic parishes. The Spanish missions were actually Indian towns with the church as the focus, where the native people learned to become Spanish citizens. The Spanish used American Indian routes to establish their missions, which through this area is the El Camino Real de los Tejas National Historic Trail. The approximate size of the park is 819 acres, approximately 623 in public ownership.

## PARK LOCATION

Since it is in an urban setting, each portion of San Antonio Missions National Historical Park is accessed from many streets and directions. Regional connectivity to the southern area of the park is provided by I-410/US 281. The central area is accessed by I-10/US 90, and the northern area by I-37/US 281 and I-10/I-35. The park is located approximately 80 miles from Austin, 145 miles from Corpus Christi, and 280 miles from Dallas.

Nearby NPS units include:

- Padre Island National Seashore (150 miles)
- Amistad National Recreation Area (175 miles)
- Big Bend National Park (415 miles)

## TRANSPORTATION OVERVIEW

San Antonio Missions National Historical Park consists of less than 1 roadway lane mile and 169,000 square feet of parking infrastructure. San Antonio International Airport lies 17 miles north of the park. The public transit system in San Antonio is VIA. Current bus transit routes allow visitors to arrive at two locations near the park (Mission San Jose and within two blocks of Mission Concepcion).

San Antonio Missions National Historical Park is comprised of multiple mission locations throughout San Antonio, TX. The Missions boast four missions and other historic sites within the park boundary. The boundary is non-contiguous and incorporates approximately 835 acres of land in both Bexar and Wilson Counties. Each mission has its own entrance location. City streets and non-motorized transportation routes are used to access the individual sites. The primary locations accessed by visitors include Mission Concepcion, Mission San Jose, Mission San Juan and Mission Espada.

## ASSET MANAGEMENT

The IMR manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of San Antonio Missions National Historical Park transportation assets is \$7.9 million.

### San Antonio Missions National Historical Park Roadway and Parking Assets

- The roadway network provides approximately 0.2 lane miles on 1 route.
- Approximately 169,000 square feet (275 spaces) of parking is provided in 8 identified parking areas.

### ROADWAY ASSETS .....

The only roadway maintained within the park is Parish Road. It is classified as a public administrative road. This road is two lanes and .08 miles long and can be found near the Mission San Juan.

**TOTAL LANE MILES = <1**



### ROADWAY PAVEMENT CONDITION RATING (PCR) .....

Parish Road is in poor condition, based on Cycle 3 RIP data.

Roadway Type	Average PCR*
All Roadways	46 - POOR
Class 1	N/A
Class 2	N/A
Class 3 to 8	46 - POOR

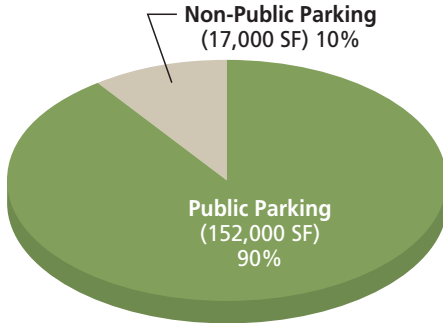
\*Cycle 3 RIP data

### CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR) .....

There are no Class 1 & 2 roadways in San Antonio Missions National Historical Park.

## PARKING ASSETS

TOTAL SQUARE FEET = 169,000



San Antonio Missions National Historical Park, like most parks, consists mostly of public parking facilities. The proportion of public parking areas is higher than most parks in the IMR. The park provides approximately 250 public and 25 non-public parking spaces. Many park visitors use parking areas outside the park boundary. These parking areas are not maintained or secured by the NPS.

## PARKING PAVEMENT CONDITION RATING (PCR)

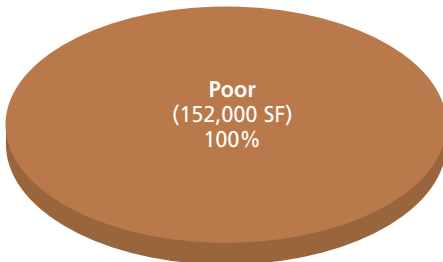
Parking Type	Average PCR*
Public Parking	50 - POOR
Non-Public Parking	51 - POOR
All Parking	51 - POOR

\*Cycle 3 RIP data

The public parking average pavement condition is rated as poor.

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

TOTAL SQUARE FEET = 152,000



All public parking areas have an average condition of poor. The bus lane parking and San Juan parking have the lowest PCRs of the 8 parking areas.

Park-wide, public parking areas provide approximately 250 spaces (152,000 square feet) and are in poor condition.

## ASSET CONDITIONS OVER TIME

Cycle 4 or 5 data has not been compiled for San Antonio Missions National Historical Park.

## TRAILS

Given the limited geography of the park, no official Transportation Trails are under the auspices of the National Park Service. However, the local San Antonio River Authority, a consortium of interested partners, is working on a hike and bike trail which will connect museums in the north part of San Antonio to the southernmost mission site in the park. The trail will go through downtown San Antonio and past all five Missions. Complete signage for the Mission Trails is not in place, so visitors must ask at each mission site for directions to the next mission. Projects on the Trail are eligible for TRIP and CMAQ funding.

Additionally, the El Camino Real de los Tejas National Historic Trail intersects the San Antonio Missions National Historical Park, but is not considered a Transportation Trail for this LRTP.

## BRIDGE AND TUNNEL ASSETS

San Antonio Missions National Historical Park does not contain bridge or tunnel assets.

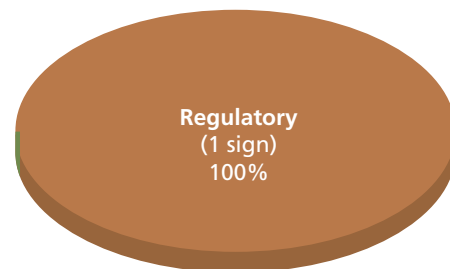
## TRANSPORTATION SIGN ASSETS

Based on Cycle 3 data, San Antonio Missions National Historical Park has one transportation sign associated with the roadway and parking assets. It is likely that the majority of signs used to access San Antonio Missions National Historical Park are maintained by the City of San Antonio or other jurisdictions rather than the National Park Service.

Condition	Quantity
Good	1
Fair	0
Poor	0

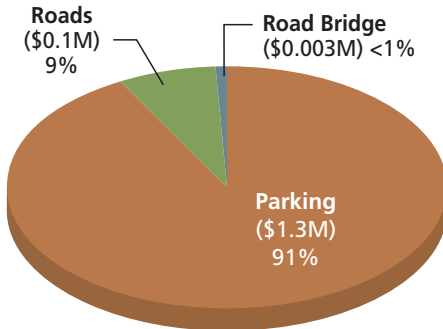
### Sign Asset Quantity and Condition

TOTAL SIGNS = 1



## DEFERRED ASSET MAINTENANCE

TOTAL DEFERRED MAINTENANCE = \$1.5M



Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Based on the Cycle 3 FMSS data, the calculated deferred maintenance within San Antonio Missions NHP equals approximately \$1.5 million.
- The Parks largest infrastructures to maintain are the parking areas.
- The levels of deferred maintenance are consistent with the amount of parking and roadways assets to be maintained.

## DEFERRED ROADWAY MAINTENANCE

TOTAL DEFERRED MAINTENANCE = \$0.19M



Approximately \$198,000 of deferred maintenance has accumulated for park roadways.

## MOBILITY, ACCESS AND CONNECTIVITY

Roadways connect each mission site in this mostly urban park. However, current signage is incomplete and wayfinding between the four non-contiguous units is confusing. Additionally, existing sidewalks and the city's transit network do not provide continuous access. The Mission Trails project is a long-term vision for a hike and bike trail, and driving route from downtown San Antonio to Espada, the southernmost mission site in the park. This project is partially under construction.

### ALTERNATIVE TRANSPORTATION SYSTEMS (ATS) .....

San Antonio Missions National Historical Park does not provide ATS services within the park. The park is served by VIA Metropolitan Transit, the public bus service. VIA has a route which will take visitors from downtown to Mission San José and within two blocks of Mission Concepción. However, there are no buses to Missions San Juan and Espada.

### MULTI-MODAL CONNECTIVITY .....

The San Antonio River Improvement Project (SARIP) has positively impacted the park and has greatly improved hiking and biking amenities. The Mission Reach project is reconnecting the San Antonio River with each of SAAN's four missions by way of trails and 'portal parks' that serve to orient visitors about each mission. Mission Trails was developed as a multi-modal way finding system leading visitors from downtown San Antonio near the Alamo to the park and connecting each of the four missions of the park through surface streets and bike lanes/trails.

#### SAN ANTONIO MISSIONS NHP HIGHLIGHT

Since San Antonio Missions National Historical Park is comprised of four separate mission locations within an urban metropolitan area, visiting all four sites can be a challenge. In an effort to expand multi-modal opportunities and regional connectivity, the San Antonio River Authority is constructing a 17 mile bike trail system that will extend from Hildebrand Avenue in north San Antonio south to Mission Espada. The trail will provide access to all mission locations within the park.

The trail system will consist of seven different segments within the San Antonio River plain. Aside from connecting all four missions, the trail system will provide access to several golf courses, the San Antonio Museum of Art, the San Antonio Zoo and White Museum, the downtown River Walk, and the Alamo. The trail will be paved and be accessible to pedestrians, bicycles and other recreational users.

### AIRPORT .....

San Antonio International Airport (SAT) is located in Northern San Antonio, approximately 17 miles north of the National Historic Park. The airport covers 2,600 acres and is the primary airport serving the San Antonio metropolitan area. In 2009, the airport averaged 260 daily domestic and international departures and arrivals.



..... **RAIL**

San Antonio Missions National Historical Park participates in the Trails & Rails program. Trails & Rails is an innovative partnership program between the National Park Service and Amtrak. This program provides rail passengers with educational opportunities that foster an appreciation of a selected region's natural and cultural heritage; it promotes National Park Service areas and provides a value-added service to encourage train ridership. It also renews the long tradition of associating railroads with National Parks.

Amtrak service to San Antonio is provided by the Sunset Limited and Texas Eagle routes.

..... **CONGESTION**

The number of vehicles entering San Antonio Missions National Historical Park has increased steadily (5.2% annually) from 2002 to 2010. The peak visitation month in 2010 was June. Based on park traffic counts, San Antonio Missions National Historical Park welcomes approximately 11,310 vehicles on a peak visitation day. Most of these are likely non-recreation trips traveling through San Antonio. San Antonio Missions National Historical Park does not currently count tour buses and RVs that visit the park.

..... **CONGESTION LOCATIONS**

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff did not provide responses to identify congested areas within the park.

..... **CONGESTION MITIGATION STRATEGIES**

Park staff did not identify ITS strategies used within the park in the 2010 Service-wide CMS survey

..... **ITS STRATEGIES**

Park staff did not identify congestion mitigation strategies currently used within the park in the 2010 Service-wide CMS survey.

..... **CRASH SEVERITY**

No Crash Data for San Antonio Missions National Historical Park is available.

..... **ANNUAL CRASHES**

No Crash Data for San Antonio Missions National Historical Park is available.

## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information that the National Park Service collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to SAAN. With close to 1.3 million visitors annually to San Antonio Missions National Historical Park, the National Park Service is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park.

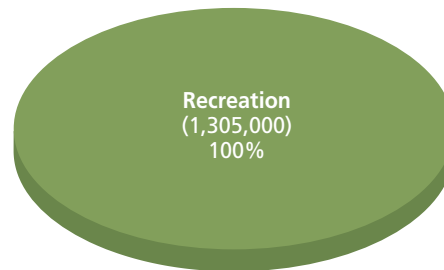
### 2010 VISITATION

Fees are not charged and reservations are not required for general entry, with the exception that larger education groups are required to make a reservation – even if planning to self-guide – so park staffing levels can be adjusted.

San Antonio Missions National Historical Park had approximately 1,305,000 visitors in 2010. The park currently does not record non-recreation trips given the multiple locations throughout San Antonio.

#### 2010 Visitation

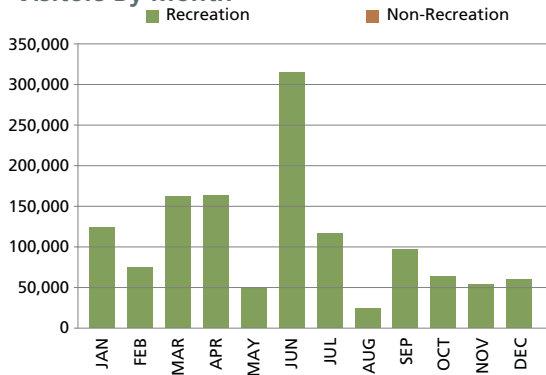
**TOTAL VISITORS = 1,305,000**



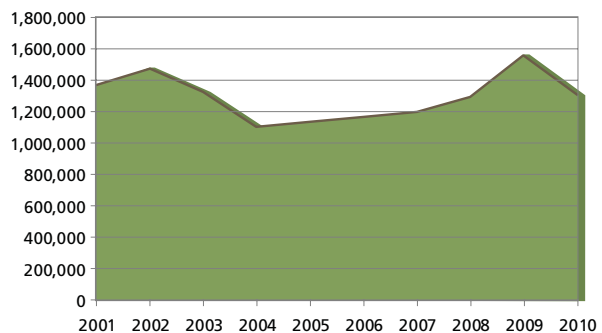
### ANNUAL VISITATION

Although recorded vehicular volumes have increased from 2000 to 2010, San Antonio Missions National Historical Park visitation has decreased by about 0.7 percent per year over the same time period. The annual visitation is rather steady with annual fluctuations, some of which are due to access points being closed for construction activities for the San Antonio River Improvement Project.

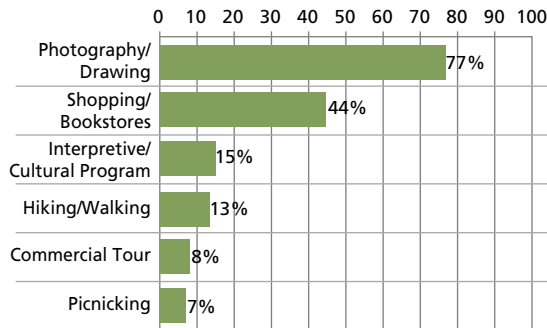
#### Visitors By Month



#### Recreation Visitation 2001-2010



## VISITOR ACTIVITIES

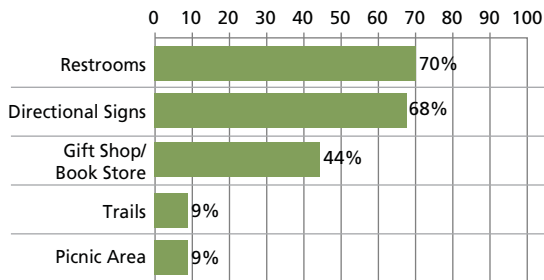


Interpretive tours of the four missions last about 45-60 minutes each and two to four hours are recommended for a visit. Visitors are guided through the Mission Concepcion, Mission San Jose, Mission San Juan Capistrano, and Mission Espada. Besides the four historic missions and their churches, visitors may also tour a grist mill at Mission San José, and the 270-year-old Espada acequia (irrigation system) with its dam and aqueduct.

Based on park surveys a majority of visitors participate in the interpretive tour program as well as shopping and photography/drawing. Over one third of visitors hike/walk within the park and also take a commercial tour. About one in ten visitors picnic within the park.

## VISITOR SERVICES USED

A majority of visitors use restrooms and directional signs while visiting San Antonio Missions National Historical Park. Since the park is located in an urban area, it is likely many of the directional signs used to access the individual missions are maintained by other jurisdictions like the City of San Antonio. Fewer than 10 percent of visitors indicate that they use picnic areas and trails within the park.



Services used include movies, regularly scheduled demonstrations, free guided tours, trails, picnic areas, shops, restrooms, and Facebook. Maps and guides to the El Camino Real de los Tejas National Historic Trail may not be available. The Park recommends consulting local guidebooks for recreational activities and other things to do.

## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- The VSP survey, completed in 1994, was not consulted for this report.
- 2010 CMS Survey – did not participate
- Surveys & Interviews, 2011
  - Congested locations: parking areas, especially during special events and regular activities at the four missions, which are the home of active Catholic church congregations
  - Strategies: improved hiking/biking amenities, improved bus transportation, general road and parking improvements, improved wayfinding

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in San Antonio Missions National Historical Park.

### AIR QUALITY AND GHG EMISSIONS

The Park has completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

#### Mobile GHG Emissions

Park Operations (MTCO <sub>2</sub> E)	145.3
Visitors (MTCO <sub>2</sub> E)	2,616.2
Concessionaires (MTCO <sub>2</sub> E)	0.0
Total Mobile GHG Emissions	2,761.5

*Climate Leadership In Parks*

### SIGNIFICANT RESOURCES

The Spanish missions of Missions National Historical Park and their associated structures and landscapes were dynamic parts of the 18th century Spanish frontier in Texas. San Antonio Missions National Historical Park was established to preserve and restore these keys to our history, and to interpret them to the public.

The primary significance of San Antonio Missions National Historical Park can be summarized as the largest concentration of cultural resources from the Spanish colonial period in the United States. Many of those resources continue to be used today for agriculture, education, worship, and as active community parishes, making them a living link from the historical past to the present.

### THREATENED & ENDANGERED WILDLIFE SPECIES

Common Name	Species Name	Listing Category	Status in Park
American Peregrine Falcon	Falco peregrinus anatum	Delisted Monitored	Current
Bald Eagle	Haliaeetus leucocephalus	Delisted Monitored	Historic

## SUSTAINABLE OPERATIONS

The emergent goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, San Antonio Missions National Historical Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

..... • **REGIONAL AND COMMUNITY STAKEHOLDERS**

San Antonio Missions National Historical Park is located in the San Antonio Metropolitan area. The four mission sites that make up the park are scattered along the San Antonio River on the south side of the city. Multiple city, state and federal streets and highways provide to the separate mission sites. This requires coordination with multiple jurisdictions. In this urban environment, the National Park Service relies on other jurisdictions to help maintain access visitor access to the park.

Regional MPO	SABCMPO – San Antonio - Bexar County MPO
Municipal	City of San Antonio
TXDOT	<ul style="list-style-type: none"><li>• I-37/US 281</li><li>• I-10/I-35</li><li>• I-10/US 90</li><li>• I-410/US 281</li><li>• SH 536</li><li>• Loop 13</li></ul>



## TRANSPORTATION RELATED PARTNERSHIPS.....

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

### Existing Partnerships

Community Partnerships	<ul style="list-style-type: none"> <li>• SAAN was established in 1978 as a partnership park with over 26 designated partner organizations highlighted in the park's enabling legislation. The more prominent partners include the Archdiocese of San Antonio, the City of San Antonio and many of its departments; Bexar County, the San Antonio Conservation Society, Texas Historic Commission, Texas Parks and Wildlife, the San Antonio River Authority, the San Antonio Water System, etc. These functional partnerships are critical to day-to-day park operations.</li> <li>• The transportation assets required to access the park are largely owned by the City. They cannot control way-finding outside park boundaries.</li> </ul>
Los Compadres	<p>Congress entrusted the four historic missions of San Antonio to the care of the National Park Service in 1978. The missions opened as a "national park" in 1983. Los Compadres was chartered as the official Friends' group to the San Antonio Missions National Historical Park in 1983. Los Compadres raises funds for special projects at the Park for which no government funds are available.</p> <p>Los Compadres' goals are to provide financial and volunteer support for the preservation and restoration of the four missions and historic irrigation systems and their development into America's premier Spanish Colonial National Park. To that end, Los Compadres has raised over \$3.9 million for projects at the San Antonio Missions National Historical Park.</p>

## CLIMATE FRIENDLY PARKS.....

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. San Antonio Missions is working to obtain CFP certification.



.....PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

**VISITOR EXPERIENCE**

- Parking
  - Parking is a major problem for the park, specifically at Mission Reach. The Park would like to purchase additional parking property. However, due to policy, the Park cannot spend money outside of park boundaries.
  - Mission Concepción - limited parking facilities are over run on weekends with visitors, recreational users (bike users who park their cars there), and parishioners.
  - Mission Espada - parish parking located within the compound footprint directly in front of the church creating a negative impact.
- Transportation Impacts
  - Inadequate facilities at Mission Concepción (negative impact).
  - Greatly improved hiking/bike amenities with the development of the Mission Reach of the San Antonio River Improvement Project (SARIP) (positive impact).
  - Greatly improved bus transportation to Mission Concepción and Mission San José - public transportation stops at both mission sites (positive impact).
- Bicycles and Pedestrians
  - SARIP is a comprehensive, multi-year, multi-agency project to restore and enhance 13 miles of the San Antonio River at a cost of \$358.3 million.
  - The Mission Reach Project is a SARIP funded project that is transforming an eight mile stretch of the San Antonio River between Mission Concepción and Mission Espada into a riparian woodland ecosystem, reconnecting the San Antonio River with each of SAAN's four missions by way of trails and "portal parks."
  - Mission Trails - developed as a multi-modal way finding system leading visitors from downtown San Antonio near the Alamo to the park and connecting each of the four missions of the park through surface streets and bike lanes/trails. Mission Trails is not fully implemented with gaps between mission sites but a pending bond election will address many of its deficiencies.
  - Some locations in the park are not ADA compliant.
- Transportation Impacts
  - Construction and development in and around the park (SARIP, Brooks City Base, etc.) often affects traffic through congestion and detours.
  - Rapid urban growth, including commuter traffic.
  - Over flight issues from a busy nearby municipal airport (Stinson Field).
  - Heavy local pedestrian use creating social trails in the park.
  - Low frequency vibrations from a train line near Mission San Juan affects long term structural stability of primary park resources.
- Communications and ITS
  - The park maintains a web site, two Facebook pages, a Twitter account and is developing an application for the iPhone/iPod/iPad.
  - The park's friends group publishes a rack card that is distributed to hotels and travel centers.
  - Technology exists to distribute traffic and weather information through TransGuide, an Intelligent Transportation System designed by TxDOT.
- Helpful Transportation Improvements
  - Mission Trails.
  - Mission Reach.
  - General road improvements in the vicinity of the park (Theo Road, Mission Road, Military Road, Roosevelt Avenue).

#### **RESOURCE PROTECTION**

- Transportation Resource Impacts
  - Large school groups delivered by school bus arrive at one time impacting on infrastructure and resources, particularly restroom facilities and parking.
  - Moving large numbers of visitors in and out of the park is a continual struggle.
- Special Events
  - Resurgence in special events are held principally at Mission San José throughout calendar year, but concentrated around Fiesta Week in April and again in the Fall. Parking for these events is primarily in overflow areas that are normally mowed field areas.
- Facilities Considered for Repurposing
  - San José Drive is considered by many to be redundant and is proposed to be removed.
  - Villamain Road is slated to be converted to a park road which will eliminate night time and undesirable use.
  - Parking facility inside the compound at Mission Espada is an example of an impact that we would prefer to eliminate.
- Key Resources
  - Four eighteenth century Spanish missions and 850 acres of cultural landscapes set aside to preserve the largest concentration of Spanish Colonial Resources in the world.
  - Large tracts of historic farmlands, irrigation canals, structures and natural areas.

#### **SUSTAINABLE OPERATIONS**

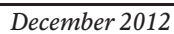
- Climate Change Risks
  - More than 40 buildings on the List of Classified Structures are very sensitive to the movement of soils caused by alternating wet and dry conditions. Periods of drought and flood are expected to swing more dramatically as the climate changes continue.
  - In 2004, the park reduced its vehicle fleet by 3 and now exclusively uses propane powered grooming mowers and electric powered utility carts in field operations.
  - The park has replaced or in process of replacing gasoline powered vehicles with 3 hybrids, 2 propane trucks, and 2 all electric medium duty trucks. By the end of FY 2012, thirty percent or 7 of the parks 21 vehicles will be alternative fueled vehicles.
- Leveraged Funding Opportunities
  - Leverages funding provided by its friend's group, Los Compadres, to accomplish a wide variety planning, infrastructure, and maintenance projects and enhance park operations and visitor experience.
  - Bexar County allocating over \$3 million dollars through bond funding to construct new trails and a Spanish Colonial Demonstration Farm at Mission San Juan.
- Other Issues
  - The San Antonio Missions NHP's boundary is not contiguous; each of the protected mission sites are an average of 3 miles apart. The park also has a protected site in Floresville, which is approximately 30 miles from the mission sites in San Antonio. This impacts visitor experience, asset management, mobility, access, and connectivity, and sustainable operations in various capacities.
  - In addition, the NPS is currently in the process of conducting a feasibility study, in collaboration with various community partners, to determine contiguous trail alignments to connect the site in Floresville to the southernmost mission in San Antonio and identify enhanced opportunities for recreation and access to the park sites.

# White Sands National Monument

(WHSA)



WHSA



# WHITE SANDS NATIONAL MONUMENT (WHSA)

## AT A GLANCE

**STATE:** New Mexico **SIZE:** 225 square miles **TYPE:** Rural

### ROADWAY/PARKING CONDITION (CYCLE 4)

	PCR	DM	Lane Miles	Area/Spaces
Roadways	82 / FAIR	\$0.3 Million	10	–
Parking	69 / FAIR	\$0.2 Million	–	65,000 SF / 105
Replacement Value of All Transportation Assets			\$31.6 Million	

Asset Management

### CONGESTED AREAS

- Parking areas/special events

### ALTERNATIVE TRANSPORTATION SYSTEM

Annual Boardings	no transit
Fuel Type	not applicable

### FEES

Transportation Fee	no
FLREA (% retention)	80%

Mobility, Access,  
& Connectivity

### VISITATION (2010)

Total Visitors	471,000
Non-Recreation Visitors	0
Recreation Visitors	471,000
10-Year Trend	-9.4%

### VISITOR EXPERIENCE QUALITY SCORE

Roads	Parking	Date
–	–	no survey

(University of Idaho Survey)

### TOP ACTIVITIES

- Hiking
- Geology
- Cycling

Visitor Experience

### AT-RISK RESOURCES

- Geologic resources
- Air quality
- Dark sky

### TRANSPORTATION/RESOURCE ISSUES

- Unauthorized parking damages fragile soils

Air Quality Status	Monitored*
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\* See page 67

Resource  
Protection

### KEY PARTNERS

- White Sands Missile Range
- Las Cruces MPO
- NMDOT/District 2

Climate Friendly Park Status	GHG Baseline
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Green House Gas Emissions	989 Metric Tons
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(CLIP)

Sustainable  
Operations

WHSA

### Key Transportation Findings and Challenges

<b>Asset Management</b>	60% of Class 1 & 2 roadway lane miles are in Fair condition
	\$0.5 million in Deferred Maintenance of transportation assets
	Lack of equipment and operators limits regularly required road maintenance due to drifting sand and gypsum
<b>Mobility, Access, &amp; Connectivity</b>	Dunes Drive is periodically closed due to missile testing on the adjacent White Sands Missile Range
	The park's distance from a major population center is a barrier to access and connectivity. The park regularly sponsors special events to attract additional visitation.
	Suitable parking, including for large vehicles, is in short supply. Friendlier parking facilities could contribute to a more positive experience and more frequent return trips.
<b>Visitor Experience</b>	2010 Recreation Visitation 470,921 (Small)
	Recreational visitation dropped 1.1% annually 2001-2010
	Adequate parking is a problem, especially during several large recurring special events
<b>Resource Protection</b>	The entire Inner Dunes Area is a natural resource composed of native soil and dunes, which is affected by high winds and the lack of parking space. The area must be carefully managed to keep visitors using parking, roadways, and picnic areas from damaging the resource, including archeological sites.
	There are no historic roads or parking areas.
<b>Sustainable Operations</b>	The Park has a good relationship with the adjacent Missile site and Department of Defense. The park must close for a few hours at a time for missile tests
	Constant maintenance demand to address blowing sand.
	The park employs one equipment operator and owns one piece of equipment for gypsum removal. If the equipment is not working, or the operator is unavailable, no work can be completed. The blowing gypsum destroys park machinery.



## MISSION

White Sands National Monument was established for the preservation of the white sands and additional features of scenic, scientific and educational interest.

## PARK DESCRIPTION

The largest gypsum dune field in the world is located at White Sands National Monument in south-central New Mexico. This region of glistening white dunes is in the northern end of the Chihuahuan Desert within an “internally drained valley” called the Tularosa Basin. The monument ranges in elevation from 3890’ to 4116’ above sea level. There are approximately 275 total square miles of dune fields here, with 115 square miles (about 40%) located within White Sands National Monument. The remaining dune fields are on military land that is not open to the public.

Formal recognition for this national monument occurred in 1933 during the Great Depression. WPA funds were used to improve many park areas and White Sands National Monument benefited by achieving a full measure of development within just a few years of opening.

Forty-four species of mammals, 26 species of reptiles, 6 species of amphibians and nearly 100 families of insects have been recorded within White Sands National Monument. Most animals inhabit the margins of the dune field and the adjacent desert plain. The area has cold winters, hot summers, very little surface water and highly mineralized ground water.

Plants surviving here must also endure being buried by moving dunes and be able to tolerate extreme fluctuations in temperature, with common sub-freezing winter lows to occasional 100+ summer days.

## PARK LOCATION

White Sands National Monument has one park entrance off U.S. 70, 15 miles from Alamogordo. The internal park road is Dunes Drive. Regional connectivity to the park is provided by I-25, I-10, U.S. 70, U.S. 82 and U.S. 54. The park is located approximately 55 miles from Las Cruces, NM; 100 miles from El Paso, TX; and 235 miles from Santa Fe, NM.

Nearby NPS units include:

- Chamizal National Memorial (70 miles)
- Guadalupe Mountains National Park (180 miles)
- Carlsbad Caverns National Park (220 miles)
- Saguaro National Park (340 miles)

## TRANSPORTATION OVERVIEW

White Sands National Monument consists of 10 roadway lane miles and 65,000 square feet of parking infrastructure. The monument has one entrance point and one main park road, Dunes Drive, for visitor circulation. This road provides access to all public places of interest within the monument.

## ASSET MANAGEMENT

The IMR manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of White Sands National Monument transportation assets is \$31.6 million.

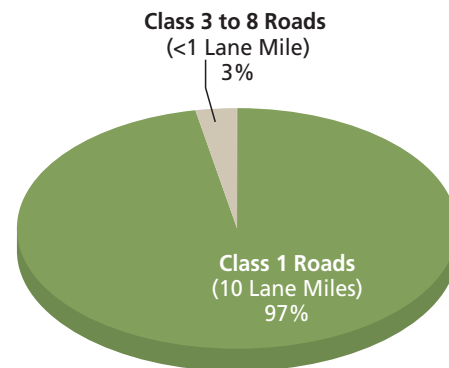
### White Sands National Monument Roadway and Parking Assets

- The roadway network is approximately 10 lane miles in length on 2 different routes.
- Approximately 65,000 square feet (105 spaces) of parking is provided in 6 identified parking areas.

### ROADWAY ASSETS

Dunes Drive, which is approximately 5 miles in length, begins at the visitor center and takes visitors to the trailheads, boardwalks and Heart of the Sands loop. Residence Area Road and Residence Area Road Loop, which are administrative access roads, make up the remaining 3% of the roadway infrastructure within the park. All of these roads can be used by the public.

TOTAL LANE MILES = 10



### ROADWAY PAVEMENT CONDITION RATING (PCR)

Overall, the average PCR for all roadways within the park is fair. Residence Area Road Loop is in the best overall condition with a PCR of 86 in the Cycle 5 data.

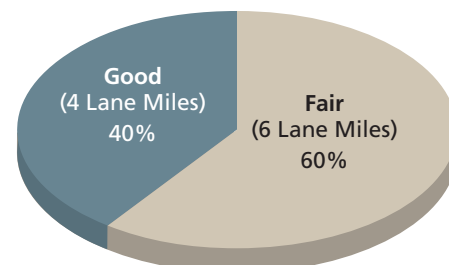
Roadway Type	Average PCR*
All Roadways	82 - FAIR
Class 1	81 - FAIR
Class 2	N/A
Class 3 to 8	86 - GOOD

\*Cycle 5 RIP data

### CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

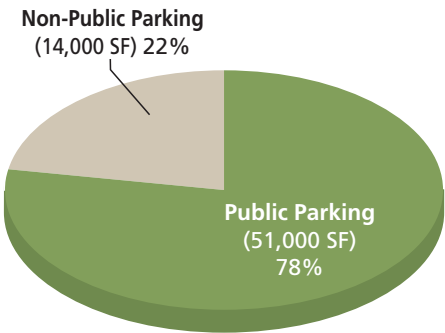
Based on the Cycle 5 asset conditions data Dunes Drive is the only Class 1 roadway in the park. With the short length of the road and the remoteness of this Monument, preventative roadway maintenance likely corrects most infrastructure degradation in one construction effort.

TOTAL LANE MILES = 10



PARKING ASSETS

TOTAL SQUARE FEET = 65,000



The majority of White Sands National Monument parking areas is considered public in nature. The gift shop, visitor center, administrative handicapped parking and Big Dune trailhead make up the primary parking lots. The utility area is classified as non-public. Park-wide there are approximately 85 public parking spaces and 20 non-public parking spaces.

PARKING PAVEMENT CONDITION RATING (PCR)

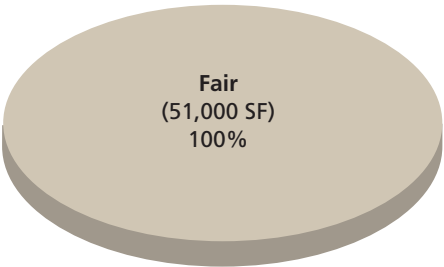
Parking Type	Average PCR*
Public Parking	69 - FAIR
Non-Public Parking	68 - FAIR
All Parking	69 - FAIR

\*Cycle 5 RIP data

Overall, the average PCR for all parking areas within the park is 69, fair.

PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

TOTAL SQUARE FEET = 51,000



Based on the Cycle 5 asset conditions data, all public parking areas are in fair condition.

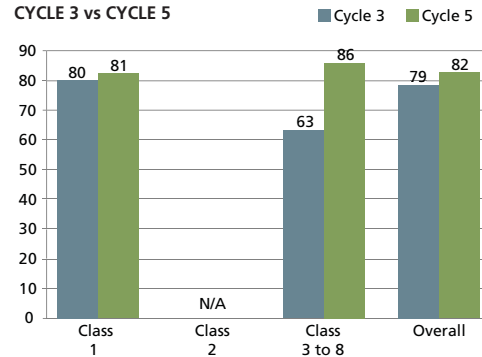
## ASSET CONDITIONS OVER TIME .....

The most recent cycle of RIP data available for White Sands roadways and parking is Cycle 5. A comparison of Cycle 3 and Cycle 5 asset data provides a snapshot of the conditions of White Sands assets over time. Between 2006 and 2012 the average roadway pavement conditions within the park improved from a PCR of 19 to 82. The average parking pavement conditions degraded from a PCR of 83 to 69.

### ROADWAY

Average pavement conditions have improved slightly from Cycle 3 to Cycle 5. Class 3 to 8 roadways experienced the greatest improvement to a good average condition.

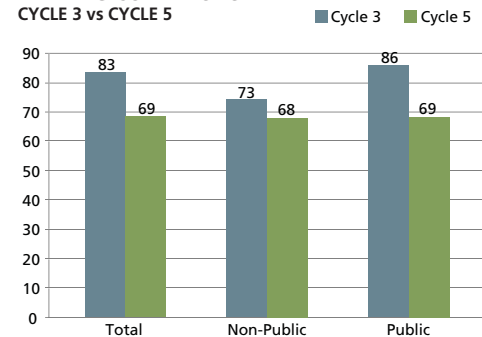
**ROADWAY CONDITIONS**  
CYCLE 3 vs CYCLE 5



### PARKING

Public and non-public parking areas degraded in average condition. Both parking classifications have average condition of fair.

**PARKING CONDITIONS**  
CYCLE 3 vs CYCLE 5



## TRANSPORTATION TRAILS .....

The Park does not contain any transportation trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities."

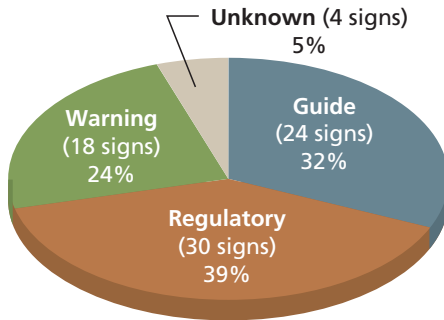
## BRIDGE AND TUNNEL ASSETS .....

White Sands National Monument does not contain bridge or tunnel assets.

## TRANSPORTATION SIGN ASSETS

### Sign Asset Quantity and Condition

TOTAL SIGNS = 76

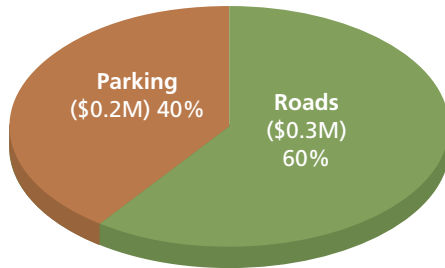


White Sands National Monument roadways and parking areas contain 76 transportation signs. Approximately 32 percent of the signs are guide signs meant to direct visitors to the desired destinations. Sixty-three percent of the signs are regulatory and warning signs. The remaining 5 percent (4 signs) have unknown types since the signs are either missing or unreadable.

Condition	Quantity
Good	72
Fair	0
Poor	0

## DEFERRED ASSET MAINTENANCE

TOTAL DEFERRED MAINTENANCE = \$0.5M

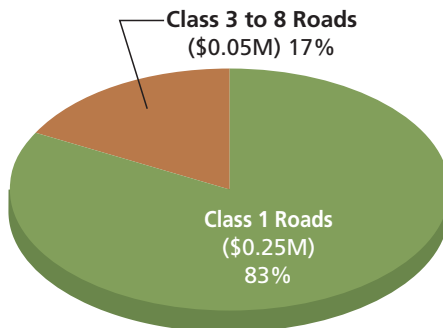


Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- The calculated deferred maintenance within White Sands National Monument equals approximately \$0.5 million.
- The majority of deferred maintenance is associated with park roadways.

## DEFERRED ROADWAY MAINTENANCE

TOTAL DEFERRED MAINTENANCE = \$0.3M



The majority of roadway deferred maintenance in White Sands National Monument is associated with Dunes Drive. Approximately 83 percent of roadway deferred maintenance is on this road. The administrative roads which have degraded pavement conditions only make up 17 percent of the deferred maintenance.

## MOBILITY, ACCESS AND CONNECTIVITY

Tools to manage congestion provide a safe experience, and to transmit information about transportation to park visitors are important goals for White Sands National Monument. Some aspects of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

### ALTERNATIVE TRANSPORTATION SYSTEMS (ATS) .....

White Sands National Monument does not provide ATS services within the park.

### MULTI-MODAL CONNECTIVITY .....

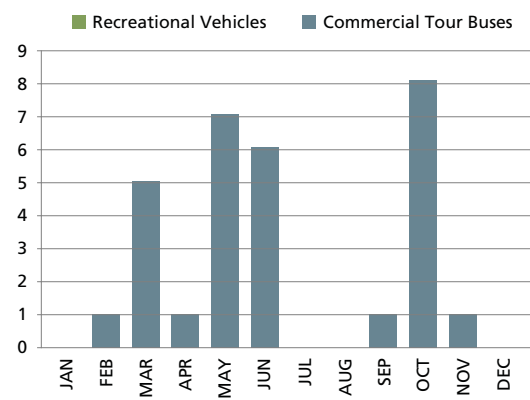
All paved roadways within the park are shared-use facilities for vehicles and bicycles. The park has a very active bicycling and pedestrian program. Special events, including moonlight bike rides, bring thousands to the park. The participants could benefit from a mobile cantina during organized events to provide drinking water and it could also serve as a checkpoint.

The Interdune Boardwalk is a 600 yard wheelchair accessible trail that provides ADA access to the top of a dune. Most other facilities in the park are ADA accessible.

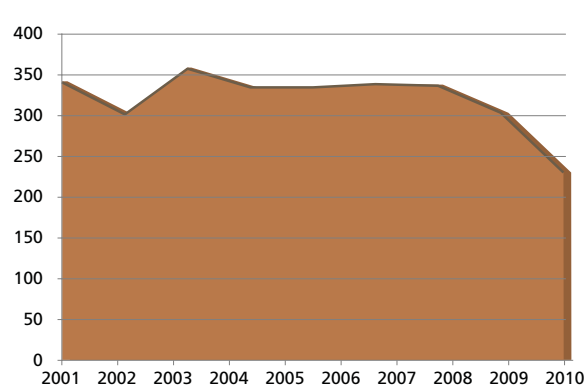
### CONGESTION .....

The number of vehicles entering White Sands National Monument decreased steadily (4.1% annually) from 2002 to 2010. The peak visitation months in 2010 were March and July. White Sands National Monument welcomes approximately 1,910 vehicles on a peak visitation day. During peak season fewer than 10 buses visit White Sands National Monument in a month. RV entrance data is not collected at White Sands National Monument. The number of buses entering the park on an annual basis has decreased since 2007.

Commercial Tour Bus and RV Vehicles



Annual Commercial Tour Bus Volumes





..... **CONGESTION LOCATIONS**

As part of the 2010 Service-wide congestion Management System (CMS) survey, park staff did not provide responses to identify congested areas within the park.

..... **CONGESTION MITIGATION STRATEGIES**

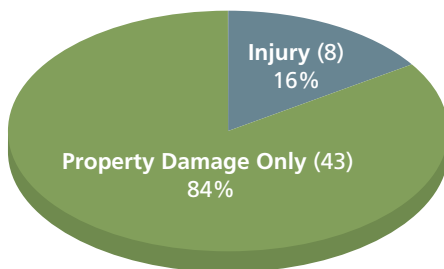
Park staff did not identify congestion mitigation strategies used within the park in the 2010 Service-wide CMS survey.

..... **ITS STRATEGIES**

Park staff did not identify ITS strategies currently used within the park in the 2010 Service-wide CMS survey.

..... **CRASH SEVERITY**

**TOTAL CRASHES = 92**



White Sands National Monument experienced 51 crashes between 1990 and 1999. None of these crashes included a fatality and 8 included at least one injury. The majority (84%) were property damage only (PDO).

..... **ANNUAL CRASHES**

Annual Data for White Sands National Monument is incomplete; no annual crash data is available from 2000 to 2005. As a result, no annual trend or graph was generated. From 1990 to 1999, White Sands National Monument averaged 3 crashes per year, a negligible number of crashes given the number of vehicles that visit the park each year.

..... **CRASH CONDITIONS**

Crash characteristics data are not available for White Sands National Monument.

## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP.

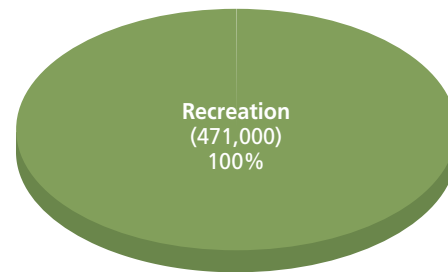
### 2010 VISITATION

Visitors are most likely to visit the park in March to October, but the park is open year-round.

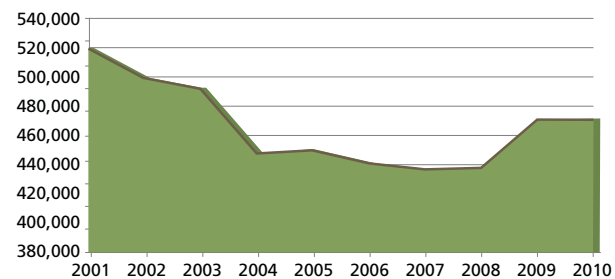
White Sands National Monument had approximately 471,000 visitors in 2010. Between 2000 and 2010, White Sands National Monument visitation decreased by about 0.9 percent per year. Non-recreation trips were not reported for 2010. The main sources of non-recreation trips in the park include employee trips and facility support vehicles. Since backcountry camping is the only overnight option in the park, there are fewer than 250 overnight stays in the park per month.

### 2010 Visitation

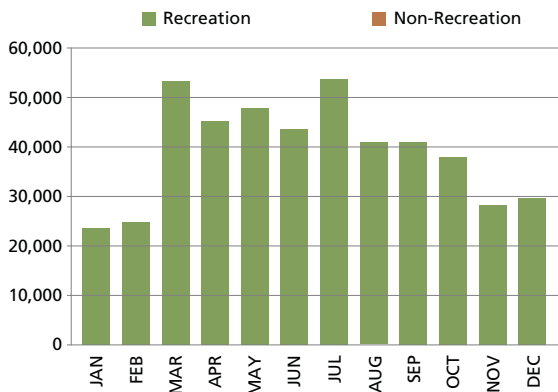
TOTAL VISITORS = 471,000



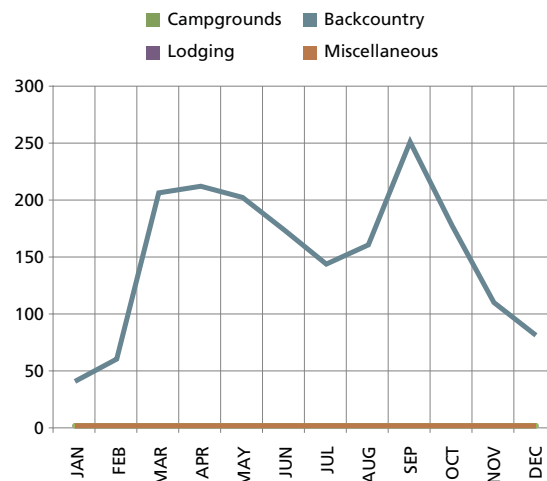
### Recreation Visitation 2001-2010



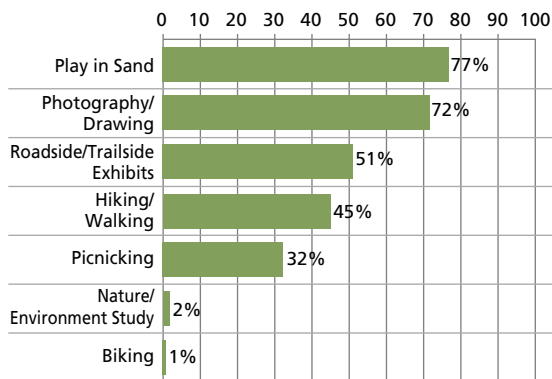
### Visitors By Month



### Overnight Stays By Month

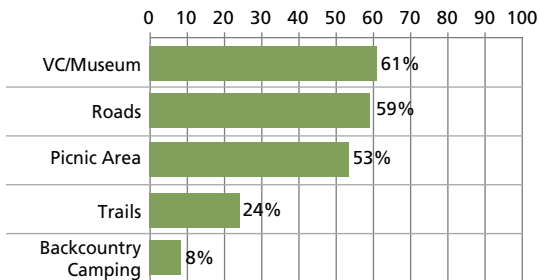


## VISITOR ACTIVITIES



The majority of visitors to White Sands National Monument enjoy playing in sand (including sledding), photography/drawing, and roadside/trailside exhibits. Between a quarter and a half of visitors picnic and hike – which is encouraged all times of day, at sunset, or on full moon nights for spectacular stargazing. There is no RV or vehicle camping allowed in the park, but 10 primitive backcountry camping sites are available by permit on a first-come-first-served basis. A once-a-month ranger-led tour of Lake Lucero is provided, weather permitting, and reservations are required.

## VISITOR SERVICES USED



Most White Sands National Monument visitors use the Historic Adobe Visitor Center and Museum, picnic areas, and Dunes Drive. Less than a quarter of visitors use trails and primitive camping areas.

## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP completed in 2012. Report to be published in 2013. The previous survey, completed in 1990, was not consulted for this report.
- 2010 CMS Survey – did not participate
- Staff Surveys & Interviews, 2011
  - Congested locations: parking areas, especially during special events, and for oversized vehicles
  - Strategies: parking and roads improvements; park website, social media, flyer distribution, and outdoor computer software information displays

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for the NPS. This section of Baseline Conditions identifies the key resources in White Sands National Monument.

### AIR QUALITY AND GHG EMISSIONS

The park is located near the Las Cruces/Dona Ana County, NM, nonattainment area for the Criteria Air Pollutant PM 10.

The park had completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

#### Mobile GHG Emissions

Park Operations (MTCO <sub>2</sub> E)	0.0
Visitors (MTCO <sub>2</sub> E)	987.8
Concessionaires (MTCO <sub>2</sub> E)	0.0
Total Mobile GHG Emissions	987.8

*Climate Leadership In Parks*

Full Moon Nights, Full Moon Hikes and Star Parties are a few of the evening events which take advantage of the clean skies over the Monument.

### SIGNIFICANT RESOURCE

The purpose of White Sands National Monument is:

- Preserve a portion of the world's largest gypsum dunefield and additional features of scenic, scientific, and educational interest
- Provide for educational and recreational opportunities compatible with the protection of those resources for future generations.

The primary significance of White Sands National Monument lies in its superlative geologic values. The dunefield is actively migrating. Dune movement is an easily observed example of a dynamic process. The story of gypsum sand, its formation into dunes and their movement, as well as the stories of the larger geological events, can be learned at White Sands National Monument, the world's largest gypsum dune field.

### THREATENED & ENDANGERED SPECIES

There are no threatened or endangered wildlife or plant species to report for this park.

## SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, White Sands National Monument is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and clean air.

### ..... REGIONAL AND COMMUNITY STAKEHOLDERS

White Sands National Monument is located near Alamogordo, NM. Main access to the park is provided by US highways maintained by FHWA and New Mexico DOT. The park is surrounded by land controlled by the Department of Defense, specifically White Sands Missile Range, Holloman Air Force Base, and Fort Bliss McGregor Range. The San Andres National Wildlife Refuge and the Jornada Experimental Range are located west of the park.

Local Jurisdictions	Alamogordo, NM
Regional MPO's and Jurisdictions	Las Cruces MPO City of Las Cruces, NM
Indian Nations	Mescalero Apache
National Forest Service	Lincoln National Forest Fish and Wildlife Service San Andres National Wildlife Refuge
Department of Defense	White Sands Missile Range Ft. Bliss McGregor Range
Department of Agriculture	Agriculture Research Service Jornada Experimental Range
NMDOT	US 54 US 70

### ..... TRANSPORTATION RELATED PARTNERSHIPS

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

#### Existing Partnerships

Volunteer opportunities throughout the park, especially during special events

#### WHITE SANDS NATIONAL MONUMENT TRANSPORTATION HIGHLIGHT

White Sands National Monument lies adjacent to two missile ranges operated by the Department of Defense. White Sands Missile Range is the location of the first atomic bomb detonation. During missile testing activities on the adjacent ranges, Dunes Drive and the interior of White Sands National Monument is closed. These closures typically last up to three hours. The park visitor center and gift shop remain open during all closures. In addition to park closures, US Highway 70 between Las Cruces and White Sands National Monument may also close during missile testing. This requires White Sands National Monument to be in regular coordination with the Department of Defense.

## PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS.....

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

### VISITOR EXPERIENCE

- The sand dunes move with the wind and roads are reconstructed to allow visitors access to the sand dunes. The park has an EA agreement which provides guidance on when to move the roads.
- The park hosts several events throughout the year. Parking is a problem during these events. The events in WHSA tend to be very large. The Alamogordo transit operator (Ztran) would like to provide shuttle services for special events.
- Parking is at a premium despite recent modest increases in space. Several spaces for longer vehicles (RVs) were included, but are still in short supply.
- The Park has a very active bicycling and pedestrian program, however participants could benefit from a mobile cantina during organized events to provide drinking water and could also serve as a check point.

### RESOURCE PROTECTION

- The entire Inner Dunes Area is a natural resource composed of native soil and dunes, which are affected by high winds and the lack of parking space.
- Berms 3 feet high are built alongside the road, parking, and picnic areas to prevent off road driving that could damage an archeological site.

### SUSTAINABLE OPERATIONS

- The Park has a good relationship with the adjacent Missile site and Department of Defense. The park must close for a few hours at a time for missile tests.
- The Park employs one equipment operator and owns one piece of equipment for gypsum removal. If the equipment is not working, or the operator is unavailable, no work can be completed. The blowing gypsum affects maintenance of park machinery.



# Yellowstone National Park

(YELL)



YELL



**OVERVIEW MAP**  
**Yellowstone National Park**  
 Roadway and Parking Facility Classification  
 August 2011

**Legend:**

- Class 1 & 2 Routes (Red line)
- Class 3 & 4 Routes (Orange line)
- Class 5 & 6 Routes (Brown line)
- Scenic Byways (Dashed blue line)
- Small Lots (Small red 'P')
- Medium Lots (Medium red 'P')
- Large Lots (Large red 'P')
- Primary Parking Lot (Red 'P' in a square)
- Secondary Parking Lot (Orange 'P' in a square)
- Administrative Parking Lot (Brown 'P' in a square)
- Unclassified Parking Lot (Under Construction) (Red 'P' in a circle)

**Map Labels:**

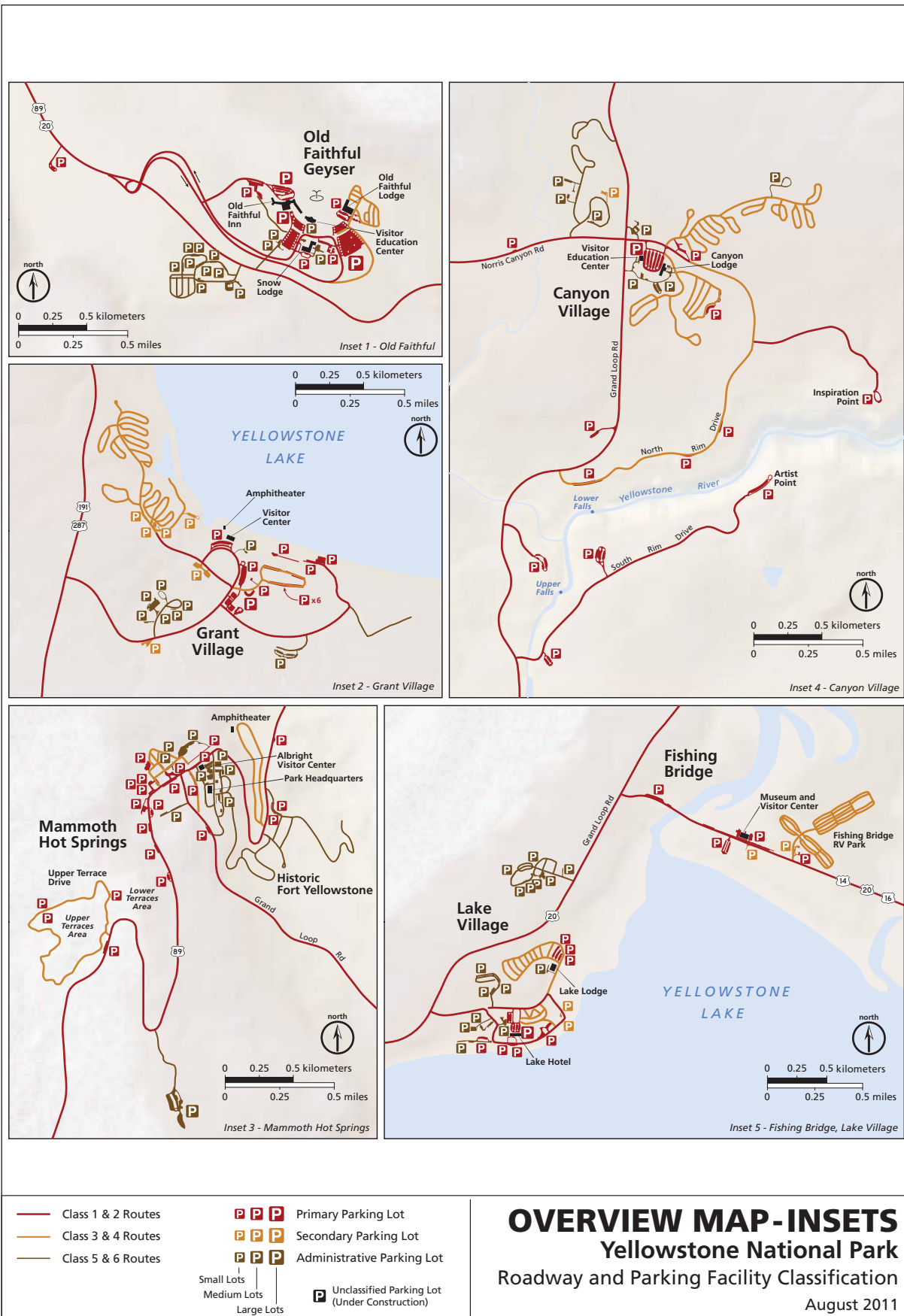
**Geographic Features:** GALLATIN NATIONAL FOREST, ABSAROKA BEARTOOTH WILDERNESS, MONTANA WYOMING, SHOSHONE NATIONAL FOREST, CARIBOU-TARGHEE NATIONAL FOREST, IDAHO WYOMING, WINEGAR HOLE WILDERNESS, JEDEDIAH SMITH WILDERNESS, GRAND TETON NATIONAL PARK, BRIDGER-TETON NATIONAL FOREST, TETON WILDERNESS, WASHAKIE WILDERNESS, ABSAROKA RANGE, GALLATIN RANGE, MADISON VALLEY, CENTRAL PLATEAU, PITCHSTONE PLATEAU, RED MOUNTAINS, TWO OCEAN PLATEAU, SOUTHEASTERN PLATEAU, SNAKE RIVER, YELLOWSTONE RIVER, LAMAR RIVER, GRAND CANYON OF THE YELLOWSTONE, YELLOWSTONE LAKE, SHOSHONE LAKE, LEWIS LAKE, WEST THUMB, BRIDGE BAY, FISHING BRIDGE, CANYON VILLAGE, NORRIS, MAMMOTH HOT SPRINGS, TOWER-ROOSEVELT.

**Scenic Byways:** Beartooth Highway National Scenic Byway, Buffalo Bill Cody Scenic Byway.

**Inset Maps:** Inset 1, Inset 2, Inset 3, Inset 4.

**Scale:** 0 5 10 kilometers, 0 5 10 miles.

**North Arrow:** north



## YELLOWSTONE NATIONAL PARK (YELL)

### AT A GLANCE

**STATE:** Wyoming **SIZE:** 3,468 square miles **TYPE:** Rural

ROADWAY/PARKING CONDITION (CYCLE 4)					Asset Management	
	PCR	DM	Lane Miles	Area/Spaces		
Roadways	80 / FAIR	\$215.3 Million	715	–		
Parking	64 / FAIR	\$34.0 Million	–	6,594,000 SF / 10,810		
Replacement Value of All Transportation Assets			\$1,310.7 Million			
					Mobility, Access, & Connectivity	
CONGESTED AREAS			ALTERNATIVE TRANSPORTATION SYSTEM			
<ul style="list-style-type: none"><li>• Park Access Roadway</li><li>• Other Park Attractions</li><li>• Parking Areas</li><li>• Park Entrance Stations</li><li>• Ped/People Loading Areas</li><li>• Pedestrian Paths/Trails</li><li>• Scenic Overlooks</li><li>• Transit Stops</li><li>• Trailheads</li><li>• Visitor Centers</li><li>• Primary Vehicle Tour Routes</li></ul>			Annual Boardings	concession		
			Fuel Type	–		
			FEES			
			Transportation Fee	no		
			FLREA (% retention)	80%	Visitor Experience	
VISITATION (2010)			VISITOR EXPERIENCE QUALITY SCORE			
Total Visitors	4,553,000		Roads	Parking		Date
Non-Recreation Visitors	913,000		–	–		no survey
Recreation Visitors	3,640,000		(University of Idaho Survey)			
10-Year Trend	+23.6%		TOP ACTIVITIES			
			<ul style="list-style-type: none"><li>• Sightseeing/scenic drive</li><li>• Viewing wildlife/birdwatching</li><li>• Boardwalk/geyser basin</li></ul>			Resource Protection
AT-RISK RESOURCES			TRANSPORTATION/RESOURCE ISSUES			
<ul style="list-style-type: none"><li>• Scenic landscapes</li><li>• Geologic resources</li><li>• Cultural resources</li><li>• Wildlife</li><li>• Soundscape</li></ul>			• Wildlife/vehicle crashes • Snowmobile emissions			
			• Noise - idling diesel buses			
			MAJOR HISTORIC TRANSPORTATION ASSET			
			• Yellowstone Main Loop			
Air Quality Status			Not Monitored/Regulated			Sustainable Operations
KEY PARTNERS			Climate Friendly Park Status			
<ul style="list-style-type: none"><li>• Yellowstone Park Foundation</li><li>• Greater Yellowstone Coalition</li><li>• US Forest Service</li><li>• Town of West Yellowstone</li><li>• WYDOT District 3/5</li></ul>			In-process			
			Green House Gas Emissions			
			Not available			

### Key Transportation Findings and Challenges

<b>Asset Management</b>	<p>\$1.31 Billion in transportation assets, 20% of all IMR assets—largest in IMR.</p> <p>DM \$284.8 M, 32% of all IMR DM—largest in IMR.</p> <p>67% of Class 1 &amp; 2 roadway lane miles in Good condition.</p> <p>91% of public parking in Fair or Poor condition.</p> <p>9 bridges may be structurally deficient or functionally obsolete, requiring near-term maintenance.</p>
<b>Mobility, Access, &amp; Connectivity</b>	<p>Congestion on the Grand Loop has somewhat improved somewhat with recent roadway widening projects. However, the long term project is years from completion. Other means, such as more advanced information systems to alert visitors to congestion and provide alternatives may be helpful.</p> <p>Connectivity, coordination, and partnerships with gateway communities such as West Yellowstone are important for the park and for the region.</p> <p>Many parks the size of Yellowstone, with large visitation, have implemented transit systems to help address congestion and mobility problems. Multiple issues have prevented a NPS-operated service from taking hold: the park's geographic location and multiple entrances limit the practicality of service for travelers that are "driving through," local tour operators fill a successful niche role, and the large cost to implement and operate such a system.</p> <p>15,000-20,000 large vehicles per month during peak season, primarily RVs.</p> <p>16% vehicle crashes involve animals.</p> <p>Parking areas at the most popular locations continue to be crowded and the location of many minor vehicle crashes. 15% vehicle crashes occur in parking lots.</p>
<b>Visitor Experience</b>	<p>2010 Recreation Visitation 3,640,185 (Large).</p> <p>Recreation visitation grew 3.1% annually 2001-2010.</p> <p>Lodges and campgrounds account for over 300,000 overnight stays in July and August.</p> <p>Park wide congestion at numerous locations.</p> <p>Severe parking congestion, including large vehicles, throughout peak season.</p> <p>Safety improved on new 30' width roads, especially for large vehicles.</p> <p>Majority of visitors make Yellowstone part of a regional trip, entering through one gate, and exiting another gate.</p>
<b>Resource Protection</b>	<p>48% of roadway lane miles and 4% of parking areas are designated as historic, including the Grand Loop Road and associated bridges. Large investments in roadway and bridge improvements take a significant portion of transportation funds spent within the region. The large inventory of historic assets contributes to costs of construction and maintenance, due to environmental regulations and the need to avoid or mitigate impacts.</p> <p>Extensive unique concentrations of natural resources (geothermal features, lakes, rivers, a dormant volcanic caldera, mountains, canyons, wildlife, endangered species) attract millions of visitors to the park, which is managed to provide both access to these resources and protection from negative impacts.</p> <p>Recent emphasis on improving noisescape, especially from idling vehicles.</p> <p>Vehicle/wildlife conflicts continue, to affect park roads, traffic, and the animals.</p>
<b>Sustainable Operations</b>	<p>The LINX program, providing intercity bus operations throughout the region, including through the park, has been discontinued.</p> <p>Unauthorized parking to view wildlife and other park features.</p>

## MISSION

Preserved within Yellowstone National Park are Old Faithful and the majority of the world's geysers and hot springs. An outstanding mountain wildland with clean water and air, Yellowstone is home to the grizzly bear, wolf, and free-ranging herds of bison and elk. Centuries-old sites and historic buildings that reflect the unique heritage of America's first national park are also protected. Yellowstone National Park serves as a model and inspiration for national parks throughout the world. The National Park Service preserves unimpaired these and other natural and cultural resources and values for the enjoyment, education, and inspiration of this and future generations.

## PARK DESCRIPTION

Yellowstone National Park, established in 1872, was the first National Park established by the United States. The park is 3,468 square miles in size and is located in the northwest corner of Wyoming, as well as portions of Montana and Idaho.

The area within Yellowstone National Park comprises of lakes, canyons, rivers and mountain ranges. Yellowstone Lake is one of the largest high-altitude lakes in North America and is centered over the Yellowstone Caldera, the largest supervolcano on the continent. The caldera is considered an active volcano.

With half of the earth's geothermal features, Yellowstone National Park holds the planet's most diverse and intact collection of geysers, hot springs, mudpots, and fumaroles. Its more than 300 geysers make up two thirds of all those found on earth. Combine this with more than 10,000 thermal features comprised of brilliantly colored hot springs, bubbling mudpots, and streaming fumaroles, and you have a place like no other.

The region was bypassed by the Lewis and Clark Expedition in the early 1800s. As a result, organized exploration of the region did not begin until the late 1860s. Shortly thereafter, the area was established as the first National Park. The US Army was commissioned to oversee the park. This duty was transferred to the National Park Services in 1917.

## PARK LOCATION

The majority of Yellowstone National Park is located in northwest Wyoming with portions in Montana and Idaho. West Yellowstone, MT; Gardiner, MT; and Cody, WY are located outside the west, north and east entrances respectively. The park is 85 miles from Jackson, WY; 210 miles from Billings, MT; 365 miles from Salt Lake City, UT; and 495 miles from Cheyenne, WY.

Nearby NPS units include:

- John D. Rockefeller Jr. Memorial Parkway (35 miles)
- Grand Teton National Park (55 miles)
- Bighorn Canyon National Recreation Area (185 miles)
- Grant-Kohrs Ranch National Historic Site (170 miles)

## TRANSPORTATION OVERVIEW

Yellowstone National Park provides 715 lane miles of roadway and 6.59 million square-feet (10,810 spaces) of parking infrastructure. There is one primary circulation route within the park; the Grand Loop Road, which is 140 miles in length. Most of the primary park features and attractions are located on the Grand Loop Road. Five entrance roads (north, west, south, east and northeast) link each park entrance to the Grand Loop Road. All of the roads in Yellowstone National Park are subject to seasonal closures except for the north and north east entrance roads and the portion of Grand Loop that connects them. This portion of park roadway is open year round. Yellowstone National Park does not have transit services which are owned or operated by the National Park Service. There are however, concessionaire operated tours of different sections of the park. These tours range from historic coach tours in the summer, to snowcoach and snowmachine tours in the winter.

The park has five primary entrances, one on each side of the park and one in the northeast corner. The busiest entrances are the west and north entrances. These entrances provide the easiest access to the Old Faithful and Mammoth Hot Springs areas of the park (the most popular attractions). The south entrance provides access to Grand Teton National Park.



## ASSET MANAGEMENT

The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Yellowstone National Park transportation assets is \$1.31 billion.

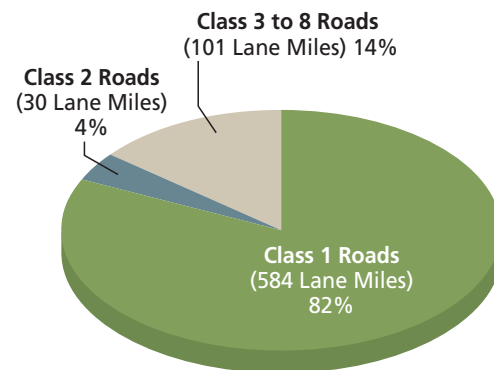
### Yellowstone National Park Roadway and Parking Assets

- Approximately 715 lane miles of roadway network on 228 different routes.
- Approximately 6,594,000 square feet (10,810 spaces) of parking area provided in 341 identified parking areas.
- 614 lane miles are defined as Class 1 or 2 roads (86%).

### ROADWAY ASSETS

Class 1 & 2 roads comprise 86 percent of roadways in Yellowstone National Park. The breakdown of roadway classifications in Yellowstone National Park is very similar to the classification breakdown for the entire IMR.

TOTAL LANE MILES = 715



### ROADWAY PAVEMENT CONDITION RATING (PCR)

The Class 1 & 2 roads have an average PCR rating of good. All other roadways have an average condition of poor. The overall average roadway condition in the park is fair.

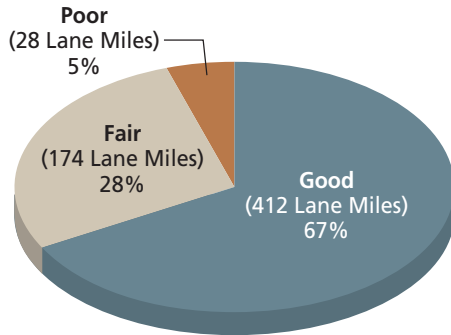
Roadway Type	Average PCR*
All Roadways	80 - FAIR
Class 1	86 - GOOD
Class 2	55 - POOR
Class 3 to 8	56 - POOR

\*Cycle 4 RIP data



## ..... CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

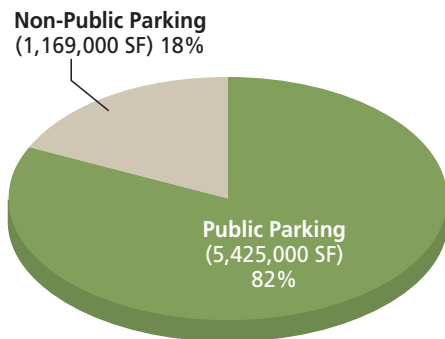
**TOTAL LANE MILES = 614**



Sixty-seven percent of roadway pavement classified as Principal Park Road (Class 1) or Connector Park Road (Class 2) within the park is rated as good. Thirty-three percent (202 lane miles) of Class 1 & 2 roadways have a fair or poor condition.

## ..... PARKING ASSETS

**TOTAL SQUARE FEET = 6,594,000**



Approximately 82 percent of the parking facilities in Yellowstone National Park are classified as public; while the remaining 18 percent make up non-public facilities. Park-wide there are approximately 8,895 public parking spaces, and 1,915 non-public parking spaces. Approximately 6.59 million square feet of pavement are maintained in the parking areas.

## ..... PARKING PAVEMENT CONDITION RATING (PCR)

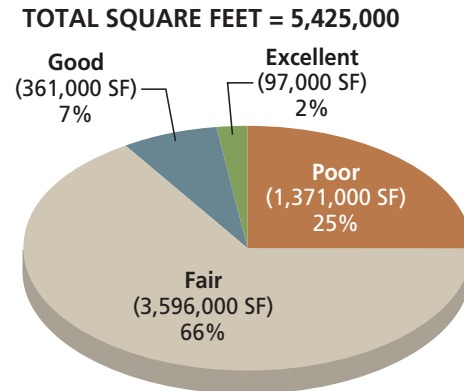
Parking Type	Average PCR*
Public Parking	64 - FAIR
Non-Public Parking	63 - FAIR
All Parking	64 - FAIR

\*Cycle 4 RIP data

Parking assets are currently in worse condition as roadway assets. The average PCR for parking and roadway conditions is rated as fair.

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR) .....

The average PCR for public parking assets is fair. Only nine percent of public parking areas are in good or excellent condition. Park-wide, public parking areas contain approximately 160 spaces (97,000 square feet) in excellent condition, 590 spaces (361,000 square feet) in good condition, and 5,895 spaces (3,596,000 square feet) in fair condition. The remaining 2,250 spaces (1,371,000 square feet) are in poor condition.



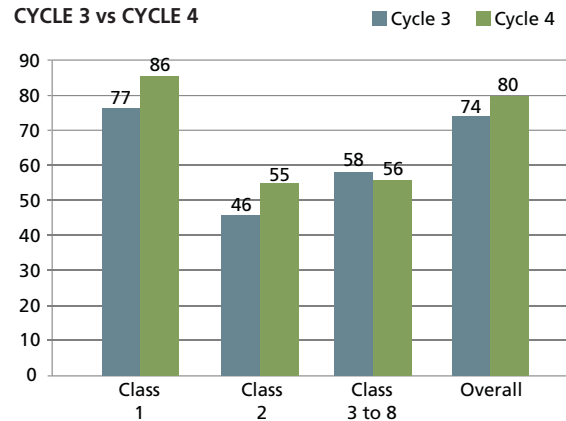
## ASSET CONDITIONS OVER TIME .....

The most recent cycle of RIP data available for Yellowstone roadways and parking is Cycle 4. A comparison of Cycle 3 and Cycle 4 asset data provides a snapshot of the conditions of Yellowstone National Park assets over time. Between 2006 and 2012 the average roadway pavement conditions within the park improved from 74 to 80. The average parking pavement conditions degraded from a PCR of 79 to 64.

### ROADWAY ASSETS

Average pavement conditions improved for Class 1 & 2 roadways. Class 3 to 8 roadways degraded slightly. Overall average conditions in the park improved. Class 1 roadways have improved to an average condition of good.

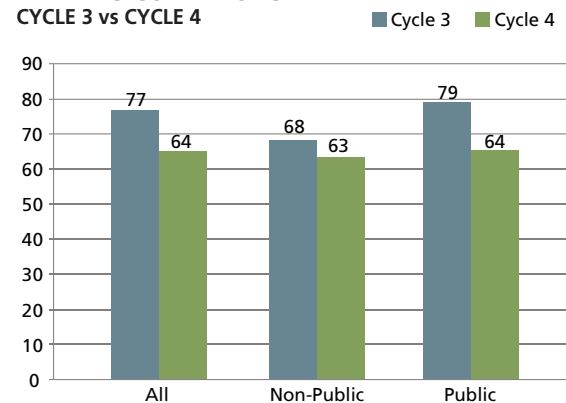
#### ROADWAY CONDITIONS CYCLE 3 vs CYCLE 4



### PARKING ASSETS

Average pavement conditions degraded for all parking types. Public parking areas experienced the greatest degradation in average condition. Parking areas have an average condition of fair.

#### PARKING CONDITIONS CYCLE 3 vs CYCLE 4

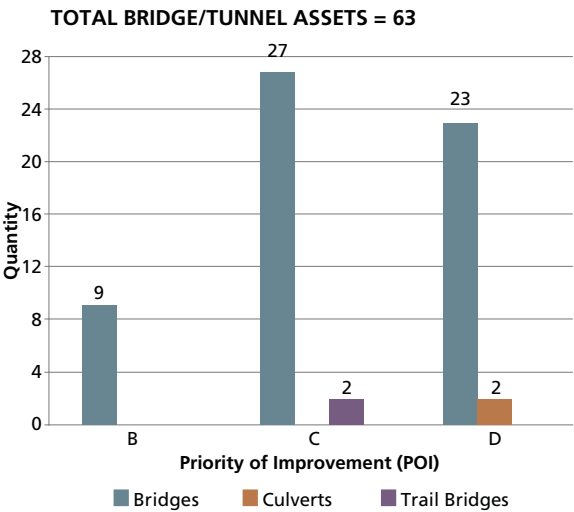


TRANSPORTATION TRAILS

The Park does not contain any transportation trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities."

BRIDGE AND TUNNEL ASSETS

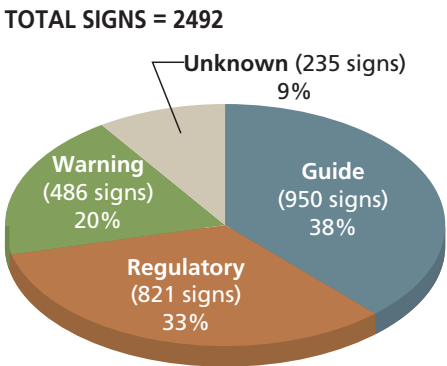
Bridge and Tunnel Asset  
Quantity and Condition



Yellowstone National Park maintains numerous structures. The park contains 59 bridges, 2 culverts and 2 trail bridges. Nine of the bridges have a POI of B indicating they structures have near-term maintenance need. All of the remaining structures have a POI of C or D indicating the structures have immediate maintenance needs.

TRANSPORTATION SIGN ASSETS

Sign Asset Quantity and Condition



Yellowstone National Park roadways and parking areas contain 2,492 transportation signs. Approximately 38 percent of the signs are guide signs meant to direct visitors to the desired destinations. Fifty-three percent of the signs are regulatory and warning signs. The remaining 9 percent (235 signs) have unknown types since the signs are either missing or unreadable.

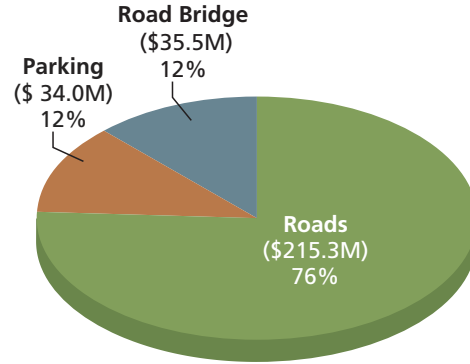
Condition	Quantity
Good	2,428
Fair	43
Poor	21

## DEFERRED ASSET MAINTENANCE

Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Deferred maintenance within Yellowstone National Park totals \$284.8 million.
- Over three-quarters of deferred maintenance is associated with park roadways (76%).
- Previous Cycle 3 data included \$11.9 million of deferred maintenance for trails. Comparable trails data was not provided for Cycle 4/5.

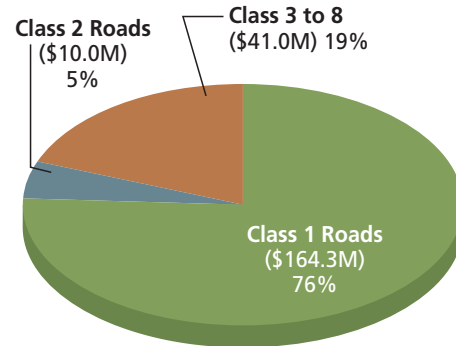
**TOTAL DEFERRED MAINTENANCE = \$284.8M**



## DEFERRED ROADWAY MAINTENANCE

- Roadway maintenance within Yellowstone National Park totals \$215.3 million
- 76 percent of roadway deferred maintenance in Yellowstone National Park is associated with Class 1 roadways
- The roadway DM proportions are consistent with the number of lane miles of each roadway classification.

**TOTAL DEFERRED MAINTENANCE = \$215.3M**



## THE YELLOWSTONE GRAND LOOP

Major reconstruction of the Yellowstone Grand Loop road began in 1989. The long-running series of projects is widening the existing travel lanes and adding shoulders where possible to both improve traffic flow and safety. The total project is approximately one-half complete as of this writing and, with an average annual allocation of approximately \$12 million, will take many years to complete.

## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks, and in Yellowstone National Park, has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. In Yellowstone National Park, this system includes a large and extensive roadway and parking network. Because of the size and scope of the park, Yellowstone National Park does not provide large scale transit services or many multi-use facilities. Not all facilities that serve to connect the region and the nation to the park are owned or operated by NPS. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

### .....ALTERNATIVE TRANSPORTATION SYSTEMS (ATS)

Alternative transportation systems is a term applied to NPS transit operations such as shuttle buses. Yellowstone National Park does not provide any large scale ATS services. Xanterra Parks & Resorts, the Yellowstone National Park concessionaire, provides bus tours within the park during the summer season. The Lower Loop tour travels the southern half of the Grand Loop Road. The Upper Loop Tour travels the northern half of the Grand Loop Road. The Grand Loop tour travels the entire Grand Loop Road in a single day. During the winter season Xanterra provides snowcoach tours from various locations within the park.

### .....MULTI-MODAL CONNECTIVITY

Bicycle access within the park is typically provided as shared-use with vehicles on the main park roads. There are no designated bike trails or lanes. Bicycling is an issue on narrower roads that have not been reconstructed to the 30-foot paved width. There are bicycle tour groups in the park under authorization permits.

Each village location also has shared-use paths that are restricted to bicycle and foot traffic. The Mammoth area has three shared-use paths that total approximately 12.5 miles. The west entrance has 1.4 miles of path. The Old Faithful area has 9.5 miles available on 4 different paths. The Lake area has two paths, each one mile in length. The Tower area provides three paths, totaling 6 miles.

### .....AIRPORTS

Operated by the Town of Jackson, Jackson Hole Airport lies about 80 miles south of Yellowstone National Park near Jackson, WY. The airport has one asphalt-paved runway, 6300-feet long and 150-feet wide. Five commercial airlines (American, Delta, Frontier, Skywest, United) provide service at Jackson Hole Airport with direct flights from major cities such as Denver, Salt Lake City, Dallas/Fort Worth, Minneapolis, Chicago, Atlanta and Los Angeles. The largest aircraft that is currently served at the airport is a Boeing 757, which can accommodate up to 289 passengers. The airport serves approximately 85 operations per day, 22 percent of which are commercial flights. The airport served over 300,000 passengers in 2008. Jackson Hole Airport is the primary airport used by visitors to Yellowstone National Park.

West Yellowstone airport is located in West Yellowstone, MT outside the west entrance of the park. It is the closest airport to Yellowstone National Park. Currently Delta Airlines is the only commercial airline that operates at the airport. Two flights a day transport passengers to/from Salt Lake City, UT. An additional flight is provided on Saturdays and Sundays. The airport is operated by the Montana

Department of Transportation. The airport has one asphalt runway that is 8,400 feet in length and 150 feet wide. The airport is closed from December 1 through May 31. No snow removal equipment is available at West Yellowstone. In 2010, West Yellowstone had approximately 4,500 commercial enplanements.

## SCENIC BYWAYS

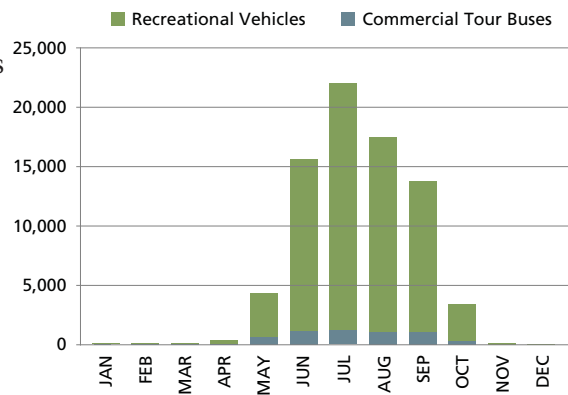
HWY #	DESIGNATION	SCENIC BYWAY
US 26/US 287/US 89/US 189/US 191	State, NFSB	Wyoming Centennial Scenic Byway
US 212	USFS, NSB	Beartooth Highway
US 14/US 16/US 20	USFS, State	Buffalo Bill Cody Scenic Byway
www.nps.gov		
NSB = National Scenic Byway, NFSB = National Forest Scenic Byway, State = State Scenic Byway		

## CONGESTION

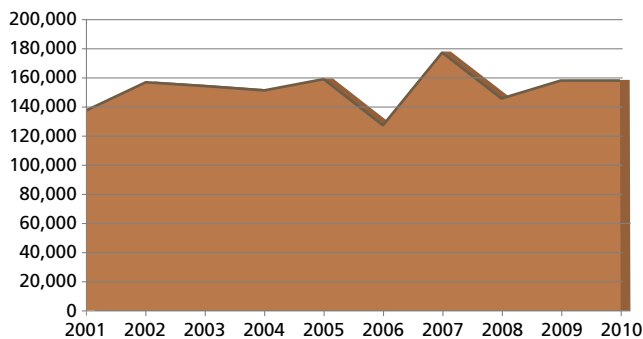
The number of vehicles entering Yellowstone National Park increased steadily (1.3% annually) from 2002 to 2010. The peak visitation month in 2010 was July. Yellowstone National Park welcomes approximately 16,450 vehicles on a peak visitation day.

During peak season, over 15,000 commercial tour buses and RVs visit Yellowstone National Park in a month. The volume of commercial tour buses that enter Yellowstone National Park is greatly outnumbered by the number of RVs. During the peak season, RVs outnumber buses 30 to 1.

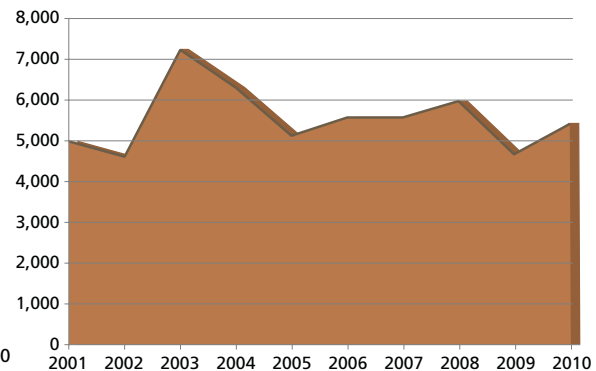
### Commercial Tour Bus and RV Vehicles



### Annual RV Overnights



### Annual Commercial Tour Bus Volumes



The number of commercial tour buses and RVs entering the park on an annual basis appear to be rather stable with slight increases in volume over the last few years.

## CONGESTED LOCATIONS

As part of the 2010 Service-wide Congestion Management System (CMS) survey, park staff identified many congested areas within the park. For many areas, staff noted the problems are park-wide. It would not be expected that all locations are congested simultaneously but that park-wide congestion fluctuates based on time-of-day. Given the concentration of visitors and activities at villages around the park, it is expected that the most visited locations will experience higher levels of congestion, more often.

Congested Areas	Locations Identified
Park Access Roadways	Numerous – Park-wide
Other Park Attractions	Wildlife – Park-wide Numerous – Park-wide
Parking Areas	Mammoth Hot Springs Boiling River Popular Trailhead Parking – Park-wide Old Faithful Area Roadway Attractions/Viewpoints/Wildlife Viewing – Park-wide
Park Entrance Stations	North Entrance West Entrance Northeast Entrance
Ped/People Loading Areas	Restrooms – Park-wide Visitor Centers – Park-wide Lodging – Park-wide Attractions – Park-wide Wildlife Viewing – Park-wide
Primary Vehicle Tour Routes	Mammoth Hot Springs Mammoth to Northeast Entrance Old Faithful to West Entrance Canyon to South Entrance Old Faithful to Mammoth
Scenic Overlooks	Numerous – Park-wide
Trailheads	Numerous – Park-wide
Visitor Centers	Mammoth Hot Springs Old Faithful Canyon

## CONGESTION MITIGATION STRATEGIES

Park staff identified one congestion mitigation strategy currently used within the park in the 2010 Service-wide CMS survey. This strategy has been used to combat the overwhelming traffic volumes experienced in localized areas.

Congestion Mitigation Strategy*	Mitigation Result*
Changes in traffic circulation	Used to combat overwhelming traffic volumes

\* Source: Service-Wide Congestion Management system (CMS); Phase 1: Emphasis Area Identification, Technical Memorandum 7: Compiled Congestion Survey



## ITS STRATEGIES .....

Park staff did not identify ITS strategies currently used within the park in the 2010 Service-wide CMS survey. The 2011 ITS in NPS report by Volpe Center identified the following ITS in use by Yellowstone National Park:

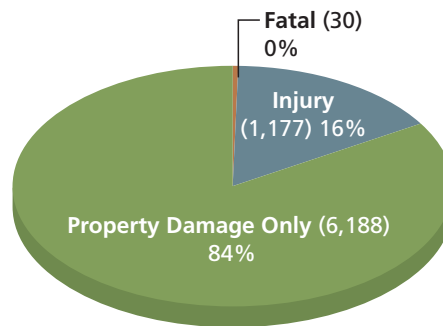
Dynamic Message Signs (portable and permanent)	511 System Integration	Highway Advisory Radio	Loop Detectors/Traffic Counters	Auto-mated Entry System	Coordinate with Other Agencies	ITS Needs Assessment/ITS Architecture (year)
X	X	X	X	X	X	X

*2011 Update on ITS in NPS, Volpe Center*

## CRASH SEVERITY .....

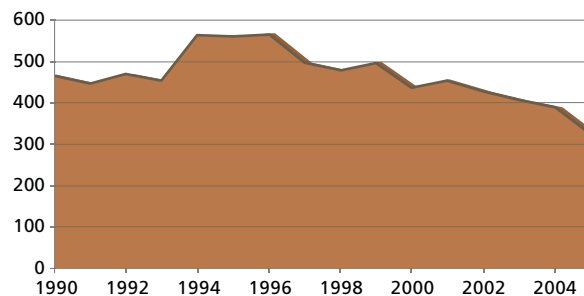
Yellowstone National Park experienced 7,395 crashes between 1990 and 2005. Thirty of these crashes included a fatality and 1,177 included at least one injury. The majority (84%) were property damage only.

**TOTAL CRASHES = 7,395**

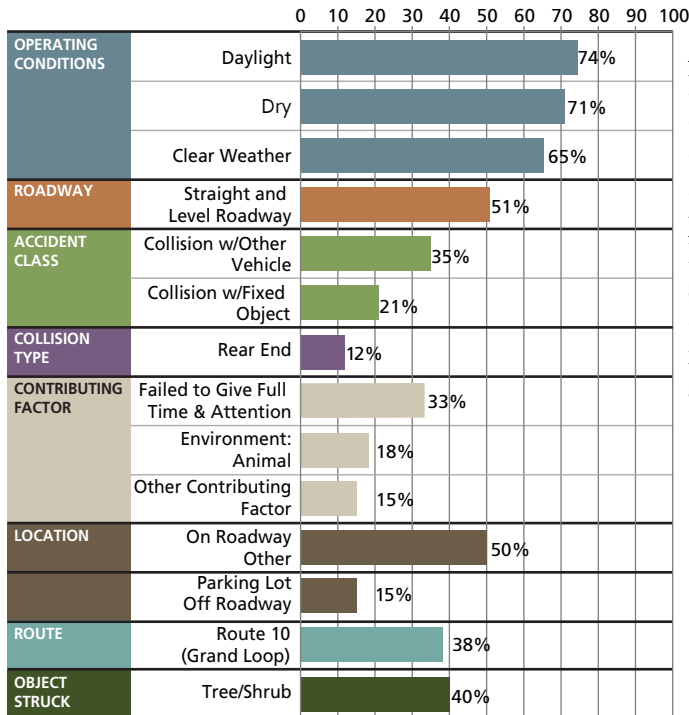


## ANNUAL CRASHES .....

Yellowstone National Park averages approximately 462 crashes each year. The park has experienced a rather consistent decrease in crashes since 1996. The number of annual crashes has decreased by approximately 4.9 percent annually since 1990. While Yellowstone National Park may have the highest number of crashes and most fatalities in the IMR, the crash rates within Yellowstone National Park are not identified as significant compared to State of Wyoming crash experience.



..... **CRASH CONDITIONS (1990-2005)**



A majority of crashes in Yellowstone National Park occur during daylight and dry conditions. Collisions with fixed objects and other vehicles account for 56 percent of crashes. Approximately 38 percent of all crashes occur on the Grand Loop Road. A majority of crashes occur on straight and level roadways. About one-quarter of crashes are caused by driver inattention. About 16 percent of crashes are caused by animal/vehicle conflicts.

**YELLOWSTONE TRANSPORTATION HIGHLIGHT**

A section of US Highway 191 in the western portion of Yellowstone National Park was selected as a test location for an animal detection system. This system is designed to detect animals crossing the highway in an animal migration corridor. When an animal is detected, the system alerts drivers to the animal's presence with the goal of reducing and eliminating animal/vehicle crashes at the monitored location.

At the Yellowstone installation, average traffic speeds were found to decrease when the animal detection system was activated compared to no warning activation. In addition, the number of vehicle collisions with large mammals decreased by 66.7 percent when the detection system was in operation. Large mammal mortality decreased by approximately 58 percent. Animal detection systems have been similarly successful in other test locations, indicating that technology is available to reduce animal/vehicle crash frequency in migration corridors.

## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information NPS collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Yellowstone National Park. With over 3.6 million visitors annually, NPS is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park. YELL's website, including Virtual Tours, videos, webcams, and village specific trip planners as well as their twitter and Facebook sites make it easier to plan a trip and spend time in meaningful ways, whether spending a single day or multiple days within the park.

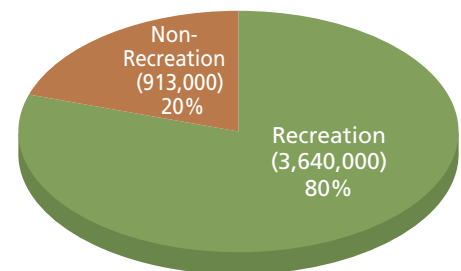
### 2010 VISITATION

Yellowstone National Park had approximately 3,640,000 recreational visitors in 2010. About 20 percent of park traffic is non-recreational. Most non-recreation trips are commercial vehicles traversing the park as well as through traffic on US 191 on the west side of the park.

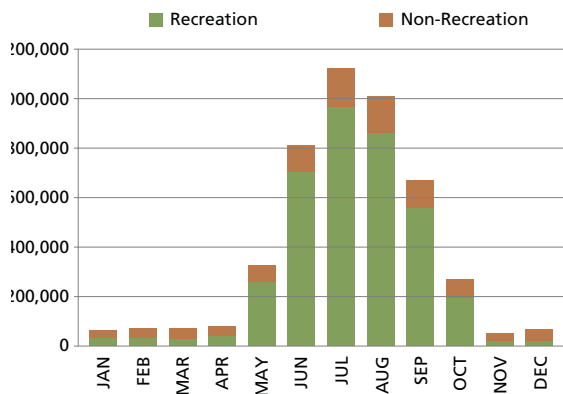
- Visitation increased by about 1.8 percent per year since 2000, but has seen more rapid increases since 2008.
- Non-recreation trips have been decreasing by about 0.5 percent per year.
- Peak visitation months are June through September – accounting for 80 percent of annual visits

#### 2010 Visitation

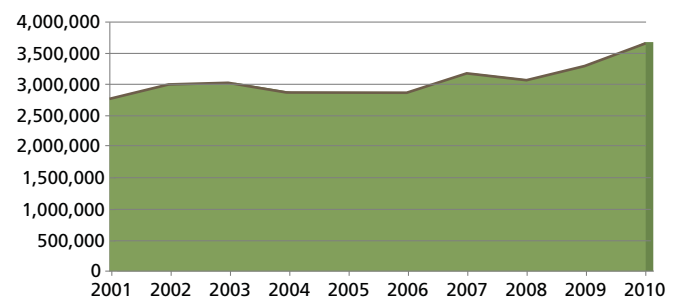
**TOTAL VISITORS = 4,553,000**



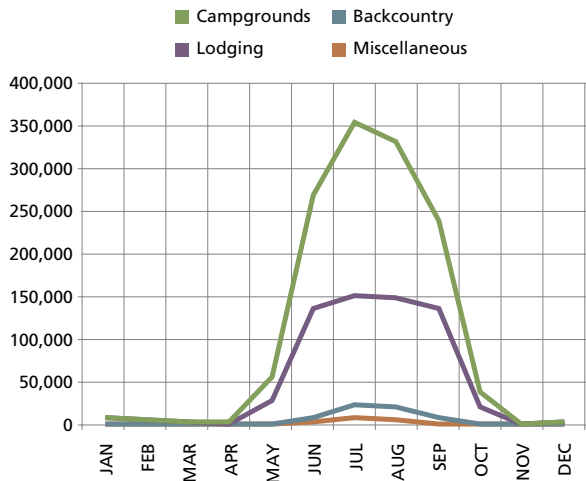
#### Visitors By Month



#### Recreation Visitation 2001-2010

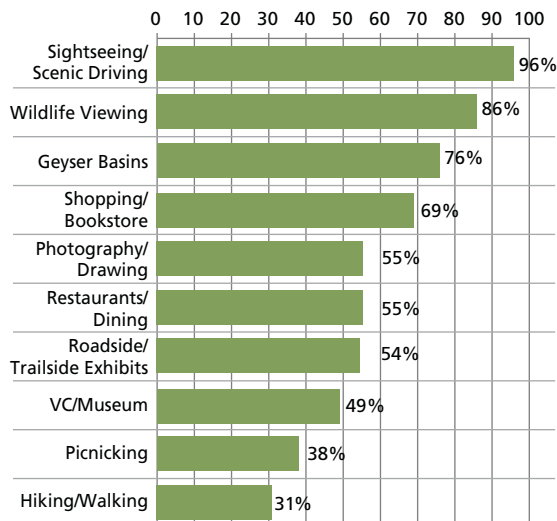


## Annual RV Overnights



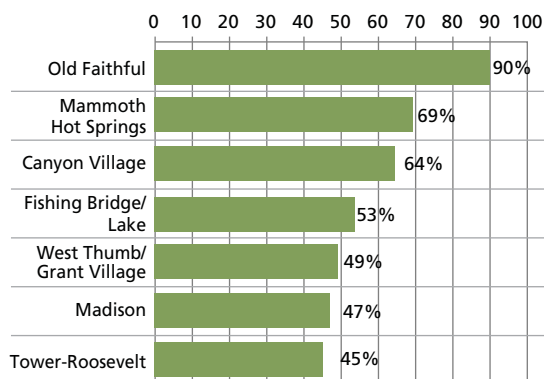
- Lodges and campgrounds account for over 300,000 overnight stays in July and August

## VISITOR ACTIVITIES



A majority of visitors participate in a wide variety of activities. Almost all visitors participate in scenic driving and wildlife viewing. The geyser basins are visited by three-quarters of park visitors. A majority of visitors also shop, dine and visit visitor centers at locations throughout the park. Hiking and picnicking are enjoyed by about one-third of Yellowstone National Park visitors.

## SITES VISITED



Visitors to Yellowstone National Park were not surveyed about specific services used within the park. However, they were asked to indicate which sites within the park they visited. Nine in ten visitors visit the Old Faithful Village area. About two-thirds of visitors also stop in Mammoth Hot Springs and Canyon Village. The remaining villages are visited by half of park visitors or less. The rate of visitation as these locations may help to indicate which areas of the park experience the most congestion.

## CONGESTION AND THE VISITOR EXPERIENCE.....

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP, 2011, stated detractions/negative visitor comments: parking is inadequate, road signs are inadequate, roads not safe – need wider shoulders.
- 2010 CMS Survey
  - Congested locations: park access roadways, other park attractions, parking areas, park entrance stations, ped/people loading areas, primary vehicle tour routes, scenic overlooks, trailheads, visitor centers
  - Strategies: changes in traffic circulation
- Staff Surveys & Interviews, 2011
  - Congested locations: parking areas
  - Strategies: park website, electronic signage, road improvements

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section identifies the key resources in Yellowstone National Park.

### SIGNIFICANT RESOURCES .....

The purpose of Yellowstone National Park is to preserve for the benefit and enjoyment of present and future generations, its geologic, natural systems and processes, and history. The primary significance of Yellowstone National Park is found in its natural and cultural resources and related values, including:

- The majority of the world's geysers, including Old Faithful, the icon of them all.
- The core of the last large ecosystem in the lower 48 states still inhabited by every wild species present when Columbus reached the New World over 500 years ago.
- The powerful evidence of human history, such as several hundred archeological sites, nearly one thousand historic structures, and six designated National Historic Landmarks---Old Faithful Inn, the Northeast Entrance Station, Obsidian Cliff, and the Norris, Madison, and Fishing Bridge Museums.

Hundreds of species of mammals, birds, fish and reptiles have been documented in Yellowstone National Park. The vast forests and grasslands also include unique species of plants. Yellowstone National Park is the largest and most famous megafauna location in the United States. Grizzly Bears, wolves, and free-ranging herds of bison and elk live in the park. The Yellowstone Bison herd is the oldest and largest public bison herd in the US.

.....THREATENED AND ENDANGERED WILDLIFE SPECIES

Common Name	Species Name	Listing Category	Status in Park
Arctic Grayling	Thymallus arcticus	Delisted	Current
Bald Eagle	Haliaeetus leucocephalus	Delisted Monitored	Current
Brown Bear	Ursus arctos	Threatened	Current
Canada Lynx	Lynx canadensis	Threatened	Current
American Peregrine Falcon	Falco peregrinus anatum	Delisted Monitored	Current
Gray Wolf	Canis lupus	Experimental	Restored

SUSTAINABLE OPERATIONS

The emergent goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Yellowstone National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and high quality clean air.

.....REGIONAL AND COMMUNITY STAKEHOLDERS

The size of Yellowstone National Park increases the scale and scope of regional coordination. Multiple gateway communities include Gardiner, MT; West Yellowstone, MT; Cody, WY; and Cooke City, MT. Access to the park is provided by US highways maintained by FHWA, Montana DOT, and Wyoming DOT. The park is surrounded by five national forests — Gallatin, Custer, Targhee, Teton and Shoshone — that are managed by the US Forest Service. Grand Teton National Park and John D. Rockefeller, Jr., Memorial Parkway also border the park to the south.

Regional Communities	Gardiner, MT West Yellowstone, MT Livingston, MT	Cooke City, MT Cody, WY Jackson, WY
US Forest Service	Gallatin National Forest Custer National Forest Shoshone National Forest	Teton National Forest Targhee National Forest
US Bureau of Land Management	National Elk Refuge	
US Bureau of Reclamation	Buffalo Bill Reservoir Jackson Lake	
US DOT (FHWA) and WYDOT	US 14 US 16 US 20 US 89	US 191 US 212 US 287



## TRANSPORTATION RELATED PARTNERSHIPS .....

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last 25 years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

### Existing Partnerships

<ul style="list-style-type: none"> <li>• Very effective relationships with gateway (and beyond) communities with road updates week to week as well as seasonally.</li> <li>• Working with state DOT public affairs staff.</li> <li>• Effective relationship with the Yellowstone Park Foundation, but not much related to transportation and roads.</li> </ul>	
The Yellowstone Park Foundation	The Yellowstone Park Foundation is a non-profit organization whose mission is to protect, preserve, and enhance Yellowstone National Park. They rely solely on the generosity of private individuals, foundations, and corporations to support projects and programs that are beyond the financial capacity of the National Park Service.
The Yellowstone Association	The Yellowstone Association's mission is to foster the public's understanding, appreciation and enjoyment of Yellowstone National Park and its surrounding ecosystem by funding and providing educational products and services.
Yellowstone National Park's Volunteer-In-Parks Program (VIP)	
Paiute Indian Youth Partnership Program	

## CLIMATE FRIENDLY PARKS .....

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Yellowstone National Park is in the CFP certification process.



..... **PARK INTERVIEWS AND PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS**

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

**VISITOR EXPERIENCE**

- Capacity, Congestion and Parking
  - Large vehicles are an issue on the roads that have not been widened to 30 feet.
  - Parking is a problem between June 15 – August 15. This congestion is becoming a safety concern for the park. The park receives a lot of complaints about parking availability, especially for turning radii, adequate space, and circulation for large vehicles.
- ATS
  - Xanterra, a concessionaire, runs the tour shuttle routes. Other outside tour operators are allowed to operate in the park as well.
  - The majority of visitors make Yellowstone a part of a regional trip. The average visitor will drive through one gate, and exit another gate. Because of this, it is believed that a comprehensive shuttle system would not be effective, however there is a possibility that a shuttle would work for employees only.
  - West Entrance Road is opened to bicycle traffic at the beginning of the season prior to being opened to vehicles. In locations where the roadway widths have been increased to 30 foot width, there has been an increase in safety for all roadway users including bicycles and animals.
- ITS and Information Systems
  - The park makes extensive use of electronic signage and web pages which are linked to local and regional chambers of commerce as well as nationally.

**RESOURCE PROTECTION**

- Resources at Risk
  - There is recent emphasis on protecting the noisescape for the park. Idling noises from tour buses have become an issue.
  - Vehicle/wildlife conflicts continue to be an issue, although the newly widened roads have helped the historic wildlife jamming problems. Problems remain on 20 mile stretch of US 191.

**SUSTAINABLE OPERATIONS**

no remarks

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# Zion National Park

(ZION)



**ZION**

# ZION NATIONAL PARK (ZION)

## AT A GLANCE

STATE: Utah SIZE: 229 square miles TYPE: Rural

### ROADWAY/PARKING CONDITION (CYCLE 4)

	PCR	DM	Lane Miles	Area/Spaces
Roadways	77 / FAIR	\$25.4 Million	79	–
Parking	72 / FAIR	\$4.3 Million	–	989,000 SF / 1,620
All Transportation Assets			\$463.4 Million	

Asset Management

### CONGESTED AREAS

- Shuttle system
- Large/towed vehicles
- Parking

### ALTERNATIVE TRANSPORTATION SYSTEM

Annual Boardings	2,800,000
Fuel Type	Propane

### FEES

Transportation Fee	\$19
FLREA (% retention)	80%

Mobility, Access,  
& Connectivity

### VISITATION (2010)

Total Visitors	2,688,000
Non-Recreation Visitors	22,000
Recreation Visitors	2,660,000
10-Year Trend	+20.0%

### VISITOR EXPERIENCE QUALITY SCORE

Roads	Parking	Date
–	–	no survey

(University of Idaho Survey)

### TOP ACTIVITIES

- Sightseeing/scenic drive
- Short hikes
- Shopping

Visitor Experience

### AT-RISK RESOURCES

- Scenic landscapes
- Geologic resources
- Wildlife
- Plant species

Air Quality Status Not Monitored/Regulated

### TRANSPORTATION/RESOURCE ISSUES

- Social Trails
- Wildlife/vehicle crashes

### MAJOR HISTORIC TRANSPORTATION ASSET

- Floor of the Valley Road
- Zion-Mt. Carmel Hwy

Resource  
Protection

### KEY PARTNERS

- Zion NP foundation
- Town of Springdale
- UDOT Region 4

Climate Friendly Park Status Certified

Green House Gas Emissions 6,416 Metric Tons

(CLIP)

Sustainable  
Operations



### Key Transportation Findings and Challenges

<b>Asset Management</b>	<p>50% of Class 1 &amp; 2 roadway lane miles in Excellent or Good condition.</p> <p>97% of public parking in Fair or Poor condition.</p> <p>\$31.1 M in deferred maintenance, 4% of IMR total.</p>
<b>Mobility, Access, &amp; Connectivity</b>	<p>2.5 M annual ATS ridership.</p> <p>The shuttle is a popular way for visitors to enter and tour the Park. However, inadequate parking for visitors at the shuttle stop in Springdale limits its attractiveness.</p> <p>The continued success of the transit system will be dependent on securing long term operational funds.</p> <p>Heavy pedestrian traffic at transit stops and trailheads, as well as unauthorized parking, negatively impacts vegetation and soils on social trails.</p> <p>1,500 – 2,400 large vehicles per month during peak season.</p>
<b>Visitor Experience</b>	<p>2010 Recreation Visitation 2,665,972 (Large).</p> <p>Recreation visitation grew 2.1% annually 2001-2010.</p> <p>Many of the shuttles are standing room only.</p> <p>High volume of vehicles pulling trailers, entering the park as often as every 6 minutes.</p> <p>Parking congestion at the South Entrance can form lines of cars beyond the park boundary and into the town of Springdale, mostly during high traffic weekends and holidays.</p> <p>There is inadequate parking at shuttle stops in the town of Springdale.</p> <p>A digital display system for the hearing impaired was installed in 2009 that provides general park/shuttle information, shuttle stop locations, etc.</p>
<b>Resource Protection</b>	<p>21% of roadway lane miles and 8% of parking areas are designated as historic, including the Floor of the Valley Road, the Zion-Mt. Carmel Highway, and associated bridges and tunnels, contributing to the cost of improvements and maintenance.</p> <p>The shuttle buses create noise impacts that affect the natural soundscape and, as noted above, an increase in social trailing (off trail hiking) around and near shuttle stops that has resulted in soil compaction, denuded areas and loss of wildlife habitat.</p> <p>Social trails from shuttle stops.</p> <p>Looking at relating transit capacity to carrying capacity of resources.</p>
<b>Sustainable Operations</b>	<p>Climate Friendly Park Certified.</p> <p>Park staff concerned that significant portion of entrance fees goes to NPS for redistribution.</p> <p>Inadequate shuttle parking in Springdale.</p> <p>Developing formal agreements with local partners regarding roles and responsibilities.</p> <p>New idle reduction policy.</p> <p>Working to identify alternative fuel vehicle options.</p>

## MISSION

The mission goals of Zion National Park are to provide park visitors with educational and recreational opportunities that foster an appreciation of Zion National Park and its resources; ensure that visitor impacts do not impair resources; maintain the resources, including plant and animal communities, at healthy and viable levels consistent with natural processes; manage cultural and physical resources to ensure long-term integrity; ensure that the built environment provides safe visitor and staff uses in a sustainable and cost-effective manner; and foster mutually supportive partnerships with private and public organizations and individuals to achieve visitor use and resource protection goals.

## PARK DESCRIPTION

Zion National Park is 229 square miles in size and was established in 1919 as Utah's first National Park. The area was originally protected in 1909 as Mukuntuweap National Monument; however the area was renamed to Zion in 1918 by the acting director of the National Park Service.

Zion National Park encompasses some of the most scenic canyon country in the United States. The park is characterized by high plateaus, a maze of narrow, deep sandstone canyons and striking rock towers and mesas. Zion National Park is a showcase of geology. Geologic processes have played an important role in shaping Zion National Park. The arid climate and sparse vegetation allow the exposure of large expanses of bare rock and reveal the park's geologic history.

The Anasazi moved southeast out of Zion National Park 800 years ago, likely due to drought and overuse. Soon after, Paiute peoples brought a lifeway fine-tuned to desert seasons and thrived. In the 1860s, just after settlement by Mormon pioneers, John Wesley Powell visited Zion National Park on the first scientific exploration of southern Utah. By hard work and faith pioneers endured in a landscape that hardly warranted such persistence.

Everything in Zion National Park takes life from the Virgin River's scarce desert waters. Water flows, and solid rock melts into cliffs and towers. A ribbon of green marks the river's course as diverse plants and animals take shelter and thrive in this canyon oasis.

## PARK LOCATION

Zion National Park is located in southwestern Utah. Springdale, UT, is located adjacent to the south entrance of the park on Utah State Highway 9. The park is 45 miles from St. George, UT, 165 miles from Las Vegas, NV, and 310 miles from Salt Lake City, UT.

Nearby National Park Service units include:

- Pipe Spring National Monument (65 miles)
- Cedar Breaks National Monument (75 miles)
- Bryce Canyon National Park (120 miles)
- Grand Canyon National Park – North Rim (125 miles)



## TRANSPORTATION OVERVIEW

Zion National Park provides 79 lane miles of roadway and 989,000 square-feet (1,620 spaces) of parking infrastructure. There is one primary circulation route within the park, Zion Canyon Scenic Drive, which is 6.1 miles in length. The route connects most of the primary destinations within the park. From the beginning of April through the end of October, Zion Canyon Scenic Drive is closed to private vehicles. All visitors must use the Zion Canyon Shuttle to access points along the route. The shuttle system was established in 1997 to better manage traffic within the park during the peak visitation season. The system has two routes, the Springdale route and the Canyon route. The Springdale route stops at six locations within the town of Springdale. The Canyon Route stops at eight locations within the park. The transfer between routes is located at the Zion Canyon Visitor Center. This is also the location of the main Park & Ride for shuttle service.

Three other roads provide access to or through Zion National Park. The Zion-Mount Carmel Highway (SH 9) traverses the southeast portion of the park between the south and east entrances. There are two tunnels and several switchbacks on this section of roadway. No bicycles or pedestrians are allowed on this route and large vehicles must be escorted through the Zion-Mount Carmel tunnel to ensure safe passage. The Kolob Terrace Road traverses the central portion of the park on the Upper Kolob Plateau. Portions of the road are not plowed in winter. The Kolob Canyons Road provides access from I-15 to the Kolob Canyons portion of Zion National Park.

The Park has two primary entrances and two secondary entrances. The south entrance, adjacent to the town of Springdale, is the busiest entrance. The east entrance is the other primary entrance and is located at the east end of the Zion-Mount Carmel Highway. Other park entrances are located on the Kolob Terrace and Kolob Canyons Roads.

## ASSET MANAGEMENT

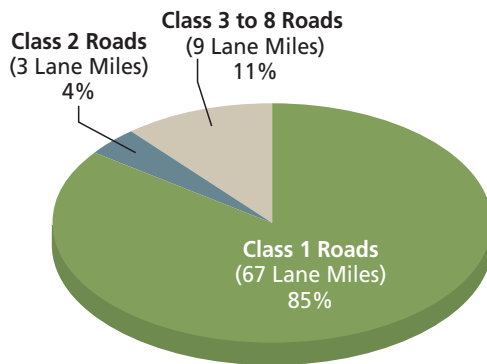
The Intermountain Region manages and maintains an enormous inventory of transportation infrastructure with a total current replacement value exceeding \$6.6 billion. The total current replacement value of Zion National Park transportation assets is \$463.4 million.

### Zion National Park Roadway and Parking Assets

- Approximately 79 lane miles of roadway network on 34 different routes.
- Approximately 989,000 square feet (1,620 spaces) of parking area provided in 50 identified parking areas.
- 70 lane miles are defined as Class 1 or 2 roads (89%)

### ROADWAY ASSETS

TOTAL LANE MILES = 79



Class 1 & 2 roads comprise 89 percent of roadways in Zion National Park. The breakdown of roadway classifications in Zion National Park is very similar to the classification breakdown for the entire IMR.

### ROADWAY PAVEMENT CONDITION RATING (PCR)

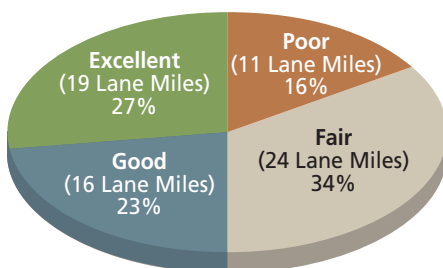
Roadway Type	Average PCR*
All Roadways	77 - FAIR
Class 1	79 - FAIR
Class 2	42 - POOR
Class 3 to 8	72 - FAIR

\*Cycle 4 RIP data

Class 1 as well as Class 3 to 8 roadways have an average condition of fair. Class 2 roadways have an average condition of poor. The overall average roadway condition for park roadways is fair.

### CLASS 1 AND 2 ROADWAY PAVEMENT CONDITION RATING (PCR)

TOTAL LANE MILES = 70

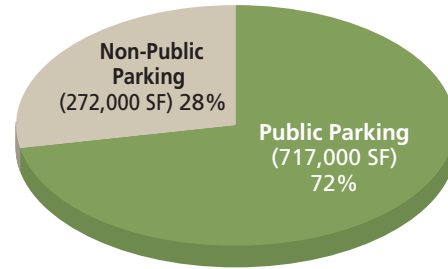


Thirty-four percent of roadway pavement classified as Principal Park Road (Class 1) or Connector Park Road (Class 2) within the park is rated as fair. Fifty percent of the Class 1 & 2 roadways have a good or excellent condition.

## PARKING ASSETS

Approximately 72 percent of the parking facilities in Zion National Park are classified as public; while the remaining 28 percent are non-public. Park-wide there are approximately 1,175 public parking spaces and 445 non-public parking spaces. Approximately 989,000 square feet of pavement are maintained in the parking areas.

**TOTAL SQUARE FEET = 989,000**



## PARKING PAVEMENT CONDITION RATING (PCR)

Parking assets are currently rated to be in similar condition as roadway assets. The average PCR for parking is rated as fair.

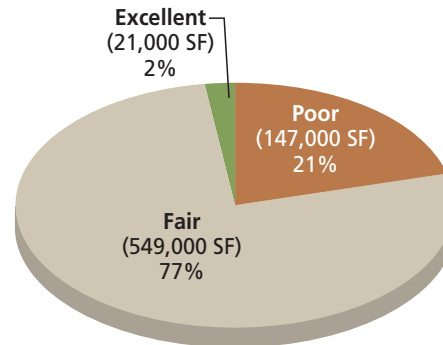
Parking Type	Average PCR*
Public Parking	71 - FAIR
Non-Public Parking	75 - FAIR
All Parking	72 - FAIR

\*Cycle 4 RIP data

## PUBLIC PARKING PAVEMENT CONDITION RATING (PCR)

The average PCR for public parking assets is fair. Ninety-eight percent of public parking areas are in fair or poor condition. Park-wide, public parking areas provide approximately 35 spaces (21,000 square feet) in excellent condition, and 900 spaces (549,000 square feet) are in fair condition. The remaining 240 spaces (147,000 square feet) are in poor condition.

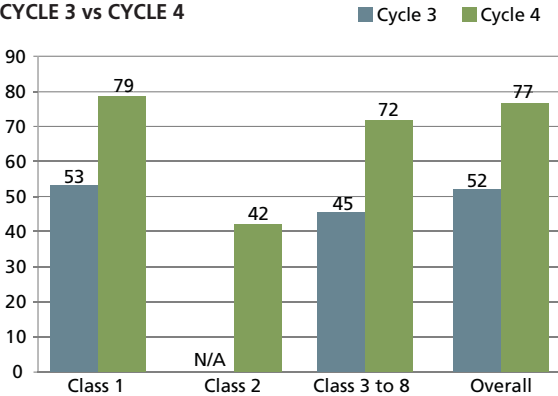
**TOTAL SQUARE FEET = 717,000**



## ASSET CONDITIONS OVER TIME

The most recent cycle of RIP data available for Zion roadways and parking is Cycle 4. A comparison of Cycle 3 and Cycle 4 asset data provides a snapshot of the conditions of Zion National Park assets over time. Between 2006 and 2012 the average roadway pavement conditions within the park improved greatly from 52 to 77. The average parking pavement conditions degraded slightly from a PCR of 76 to 71.

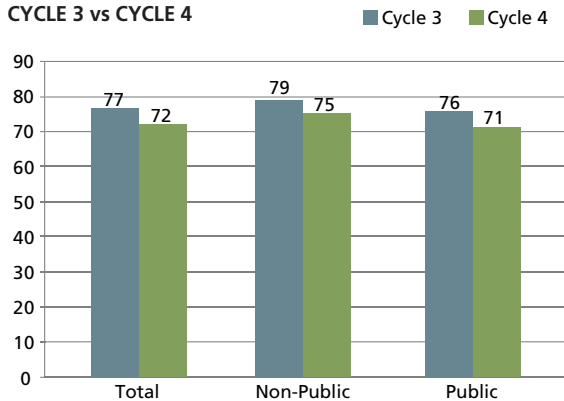
### ROADWAY CONDITIONS CYCLE 3 vs CYCLE 4



### ROADWAY

Average pavement conditions for the park improved from poor to fair in Cycle 4. Class 1 and Class 3 to 8 roadways improved to fair condition. Class 2 roadways are in poor condition.

### PARKING CONDITIONS CYCLE 3 vs CYCLE 4



### PARKING

Average pavement conditions degraded slightly for all parking areas. Both public and non-public parking areas remained in fair condition in Cycle 4.

## TRANSPORTATION TRAILS

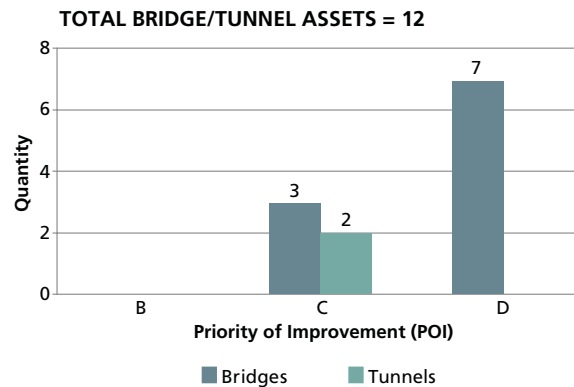
The Park contains two transportation trails meeting the definition: "...paved, distinct multi use trails that provide an alternative method of access to front country facilities." The Pa'rus Trail offers a paved, car-free alternative for bicyclists to connect with the Zion Canyon Scenic Drive. The trail is also open to pedestrians and leashed pets. The trail is 1.7 miles long and connects the Zion Canyon Visitor Center to Zion Canyon Scenic Drive, providing an alternative to shuttle use. The Grotto Trail connects the Zion Lodge to The Grotto. Both trails provide access to shuttle stops.

	Deferred Maintenance	Current Replacement Value	Condition
Grotto Trail	\$16,703	\$237,022	Good
Pa'rus Trail	\$560,932	\$24,546,388	Good

## BRIDGE AND TUNNEL ASSETS

Zion National Park maintains numerous structures. The park contains 10 bridges and 2 tunnels. All of the structures have a POI of C or D indicating the structures do not have immediate maintenance needs.

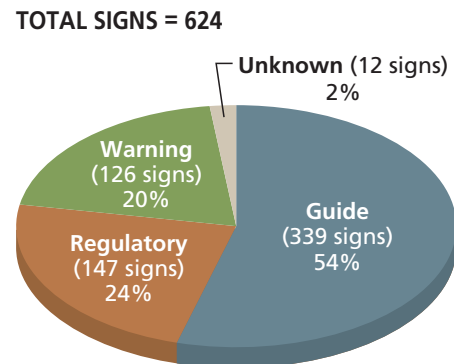
Bridge and Tunnel Asset  
Quantity and Condition



## TRANSPORTATION SIGN ASSETS

Zion National Park roadways and parking areas contain 624 transportation signs. Approximately 54 percent of the signs are guide signs meant to direct visitors to the desired destinations. Forty-four percent of the signs are regulatory and warning signs. The remaining 2 percent (12 signs) have unknown types since the signs are either missing or unreadable.

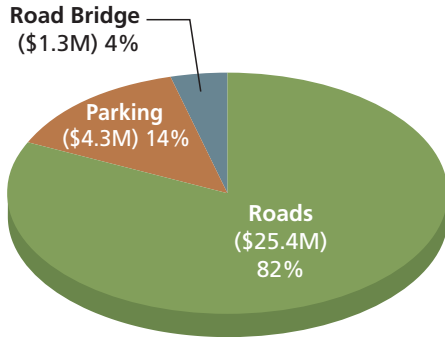
Sign Asset Quantity and Condition



Condition	Quantity
Good	621
Fair	2
Poor	1

## DEFERRED ASSET MAINTENANCE

TOTAL DEFERRED MAINTENANCE = \$31.1M

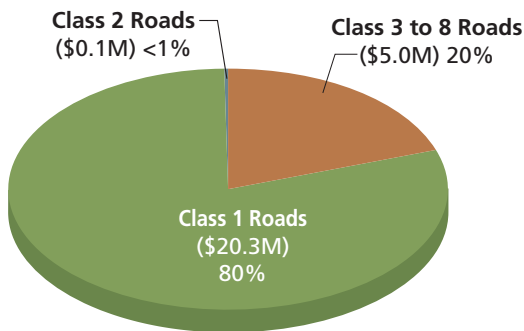


Deferred maintenance is a cost category that represents the sum of all maintenance that was not performed when it was scheduled to be, and has been subsequently delayed. It does not include annual preventative maintenance, operational costs or emergency maintenance.

- Deferred maintenance within Zion National Park totals \$31.1 million.
- Over three-quarters of deferred maintenance are associated with park roadways (82%) – substantially higher than most focus parks.
- Roadways and parking constitute approximately 96 percent of the park's total deferred maintenance for transportation assets.
- Previous Cycle 3 data included \$12.8 million of deferred maintenance for trails. Comparable trails data was not provided for Cycle 4/5.

## DEFERRED ROADWAY MAINTENANCE

TOTAL DEFERRED MAINTENANCE = \$25.4M



- Roadway maintenance within Zion National Park totals \$25.4 million
- 80 percent of roadway deferred maintenance in Zion National Park is associated with Class 1 roadways.
- Class 3 to 8 roadways have a substantially higher proportion of deferred maintenance compared to their respective proportion of lane miles.

## MOBILITY, ACCESS AND CONNECTIVITY

The role of transportation in national parks, and in Zion National Park, has evolved from simply building a road and perhaps some campsites, to a complex system that includes much more than managing pavement and parking facilities. In Zion National Park, this system includes a roadway and parking network, and extensive shuttle system and park & ride lot, a town shuttle that connects to the park shuttle, and a paved multi-use trail. Not all facilities that serve to connect the region and the nation to the park are owned or operated by the National Park Service. However, all are important tools to manage congestion, provide a safe experience, and to transmit information about transportation to park visitors. Some pieces of the operation, like pedestrian facilities and non-recreational trails, serve to connect modes, points of interest, and other facilities in a useful way.

### ALTERNATIVE TRANSPORTATION SYSTEMS (ATS) .....

Alternative transportation systems is a term applied to NPS transit operations such as shuttle buses. Zion National Park is home to one of the first mandatory shuttle systems within a national park. The free system, which consists of two separate routes, is operated by McDonald Transit, the park concessionaire. The Springdale route provides service to six stops within the town of Springdale, immediately south of the park. The Canyon route provides service to eight stops within Zion National Park along the Zion Canyon Scenic Drive. Transfers between routes are available at the Zion Canyon Visitor Center.

The shuttle system operating schedule provides nearly 46,000 service miles and 530,000 service hours on an annual basis. This service plan serves over 2.5 million passengers annually, which puts the shuttle service over the estimated capacity of the routes. A cooperative agreement has the NPS providing transit service (between the park and the town) and the town of Springdale providing suitable parking for park

visitors. However, the popularity of the Springdale route has led to problems with inadequate parking near shuttle stops in the town. Businesses reserve their parking lots for customers only, rather than allow parking by park visitors who may potentially patronize their business before or after their time in the park.

Zion National Park ATS Summary

Annual Boardings <sup>1</sup>	2,800,000
Service Hours <sup>2</sup>	46,000
Service Miles <sup>2</sup>	531,000
Quantity and Type <sup>3</sup>	30 ADA accessible shuttle buses
Fuel <sup>3</sup>	Propane
Operating Season and Schedule <sup>3</sup>	April through October
Operator <sup>3</sup>	Parks Transportation, Inc.
Options to using the ATS	Private vehicles

<sup>1</sup>Source: ZION Phase I ATS PRO FORMA

<sup>2</sup>Source: 2007 Operating Statistics compiled in DEA Baseline Conditions Report

<sup>3</sup>ZION ATS Phase II Operational and Contractual Characteristics Report

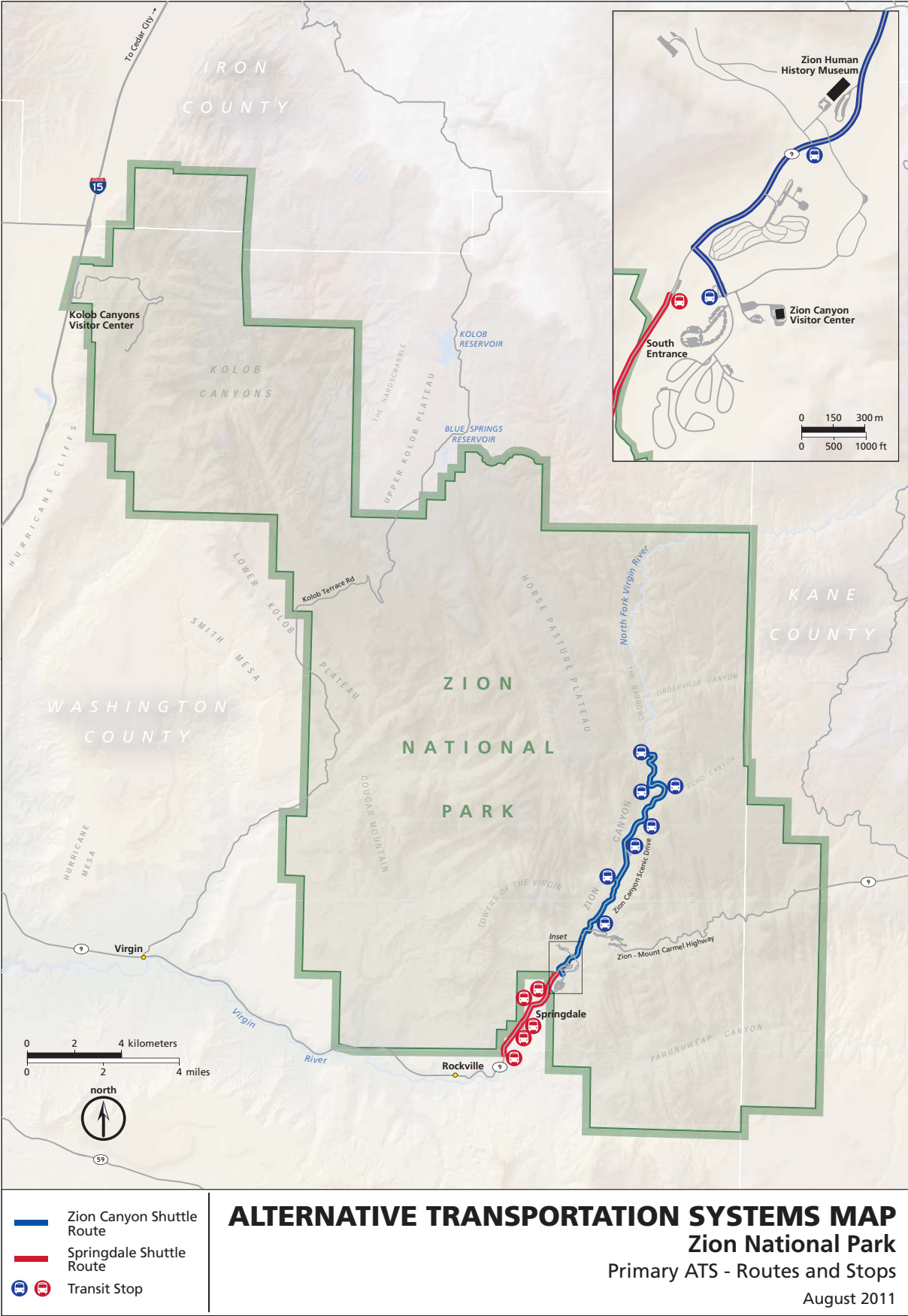
### SCENIC BYWAYS .....

PARK	HWY #	DESIGNATION	SCENIC BYWAY
ZION	SH 9/I-15	State	Zion Park Scenic Byway (U-9)
BRCA, ZION		State, NSB, NFSB	Scenic Byway 143 Utah's Patchwork Parkway
NSB = National Scenic Byway, NFSB = National Forest Scenic Byway, State = State Scenic Byway			

[www.nps.gov](http://www.nps.gov)

Zion National Park is a destination on the Grand Circle (see page 46).





## MULTI-MODAL CONNECTIVITY .....

Bicycles are allowed in Zion National Park and, in fact, are encouraged and very popular. All shuttles in the park are equipped with bicycle racks to enhance multi-modal usage within Zion National Park. To avoid the steep road incline into Zion Canyon, visitors often transport their bike via the shuttle, then bicycle out of the canyon. Bicycle tour guides shuttle bicyclists through the tunnel. There are multiple bike rental places in the area.

The Pa'rus Trail offers a paved, car-free alternative for bicyclists to connect with the Zion Canyon Scenic Drive. The trail is also open to pedestrians and leashed pets. The trail is 1.7 miles long and connects the visitor center to Zion Canyon Scenic Drive, providing an alternative to shuttle use.

There are some hiking trails, but not to the head of the canyon. There is no room on the roadway to accommodate pedestrians, and none can be built without damaging the resource. In Zion Canyon, social trails radiate from the shuttle stops and parallel to the river.

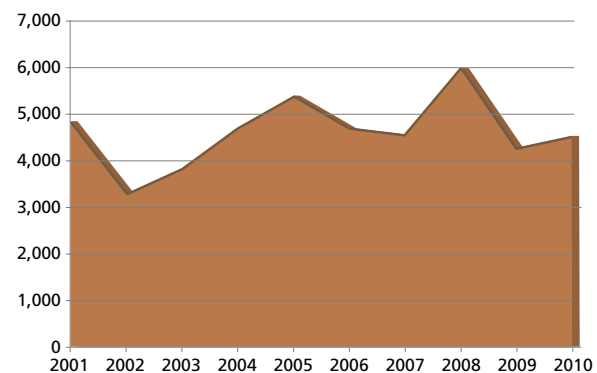
The park is working with Springdale to better orient visitors to the transportation system with improved wayfinding, signage, and messaging. People with disabilities can drive to the lodge, park, and then get the shuttle. There is a 1/4 mile walk from the Springdale shuttle to the canyon shuttle.

## CONGESTION .....

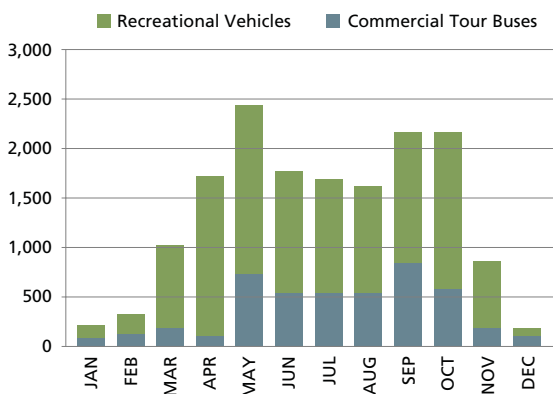
The number of vehicles entering Zion National Park increased from 2002 to 2010. The peak visitation month in 2010 was July. Zion National Park welcomes approximately 4,330 vehicles on a peak visitation day.

During peak season, over 500 commercial tour buses enter Zion National Park in a month. Over 1,000 RVs also enter the park on a monthly basis. The volume of commercial tour buses and RVs actually decreases in Zion National Park during the peak months of June, July and August.

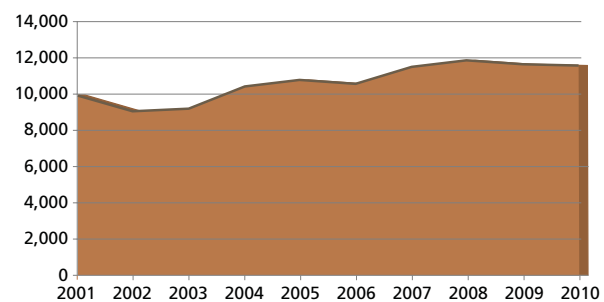
Annual Commercial Tour Bus Volumes



Commercial Tour Bus and RV Vehicles



Annual RV Overnights



The number of commercial tour buses entering the park on an annual basis appears to be stable and slightly decreasing in recent years. The volume of RVs entering the park is also stable but slightly increasing over the past few years.

## CONGESTED LOCATIONS

An interview with park management and a follow-up survey indicated that parking congestion at the South Entrance can form lines of cars beyond the park boundary and into the town of Springdale, mostly during high traffic weekends and holidays. The park constructed an overflow parking lot near the Visitor Center to provide more parking capacity, partly relieving congestion at the South Entrance. However, parking in Springdale near shuttle stops remains inadequate.

## CONGESTION MITIGATION STRATEGIES

Park staff did not identify operation/mobility mitigation strategies currently used within the park in the 2010 Service-wide CMS survey. The shuttle program however, would be considered a successful operations and mobility based strategy.

## ITS STRATEGIES

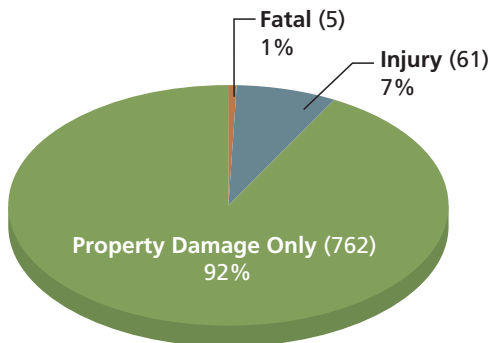
Dynamic Message Signs (portable and permanent)	Highway Advisory Radio	Coordinate with Other Agencies
x	x	x

A new report, *2011 Update on ITS in NPS*, identified several strategies being used in Zion NP.

*2011 Update on ITS in NPS, Volpe Center*

## CRASH SEVERITY

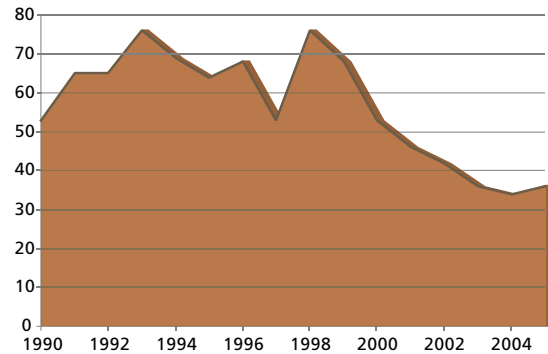
**TOTAL CRASHES = 828**



Zion National Park experienced 828 crashes between 1990 and 2005. Five of these crashes included a fatality and 61 included at least one injury. The majority (92%) were property damage only.

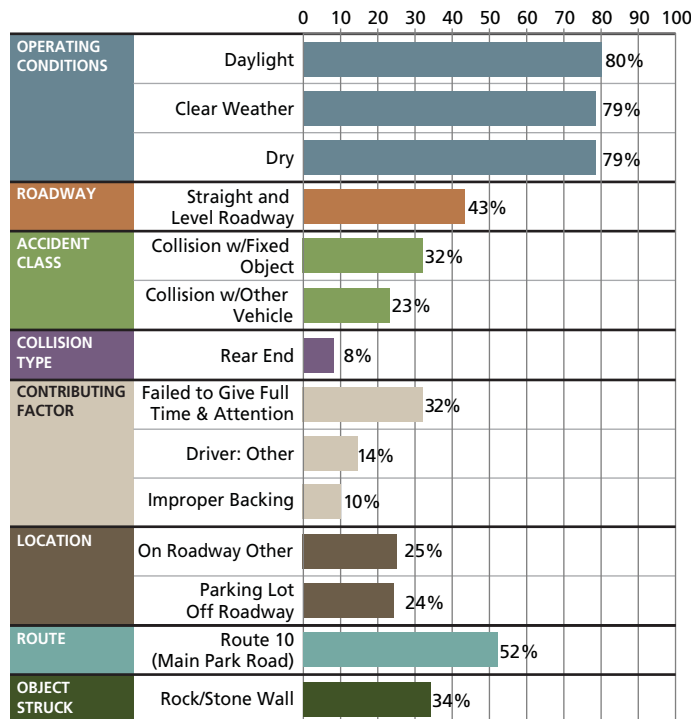
## ANNUAL CRASHES

Zion National Park averages approximately 52 crashes each year. The park has experienced a rather sharp decrease in the annual number crashes since 1998. This would coincide to the time-line where the shuttle system was introduced to the park. The number of annual crashes has decreased by approximately 4.7 percent annually since 1990. The crash rates within Zion National Park are not identified as significant compared to State of Utah crash experience.



## CRASH CONDITIONS

A majority of crashes in Zion National Park occur during daylight and dry conditions. Collisions with fixed objects and other vehicles account for 55 percent of crashes. Approximately 52 percent of all crashes occur on Zion-Mount Carmel Highway. About half of crashes occur on straight and level roadways while a quarter of crashes occur in parking lots. About one-third of crashes are caused by driver inattention.



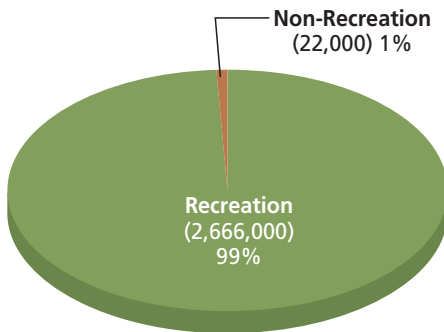
## VISITOR EXPERIENCE

The visitor experience, also a NPS mission-driven goal, is a key focal point of the LRTP. This section highlights information that National Park Service collects about visitors and points the way with state-of-the-art programs and systems that enhance every visit to Zion National Park. With over 2.6 million visitors annually, the National Park Service is challenged to manage the experience in a way that enhances, but does not intrude on, time spent in the park. Zion National Park's website, including Virtual Tours, videos, "Ranger Minute" audio broadcasts, and webcams, as well as their Twitter and Facebook sites, make it easier to plan a trip and spend time in meaningful ways, whether spending a few hours, a single day, or multiple days within the park.

### 2010 VISITATION

#### 2010 Visitation

TOTAL VISITORS = 2,688,000

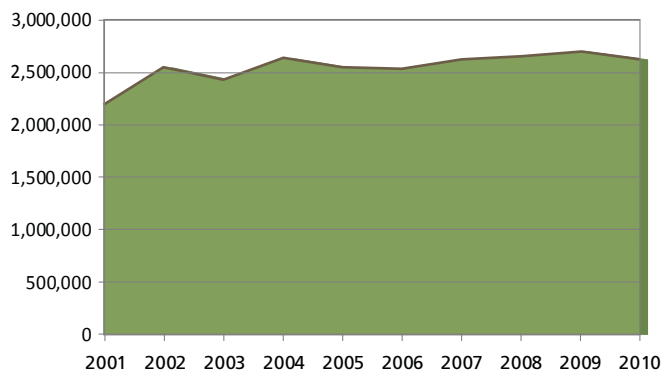


Zion National Park had approximately 2,666,000 recreational visitors in 2010. About one percent of park traffic is non-recreational. Most non-recreation trips are commercial and through vehicles traversing the park on SH 9 as well as employee and facility support trips within the park.

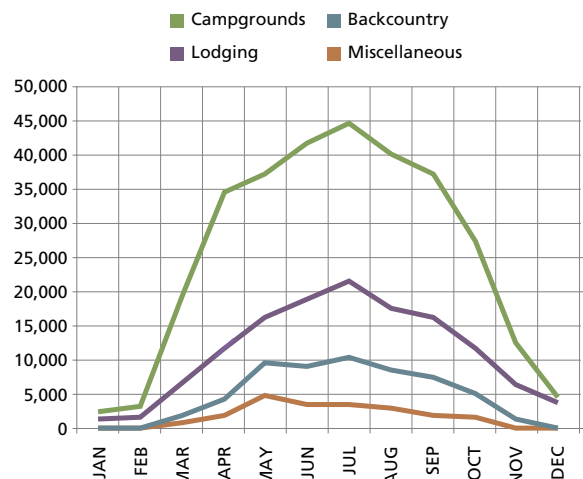
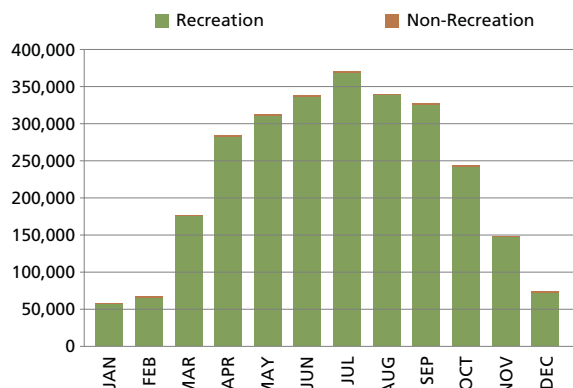
### VISITOR

### ANNUAL VISITATION

#### Recreation Visitation 2001-2010

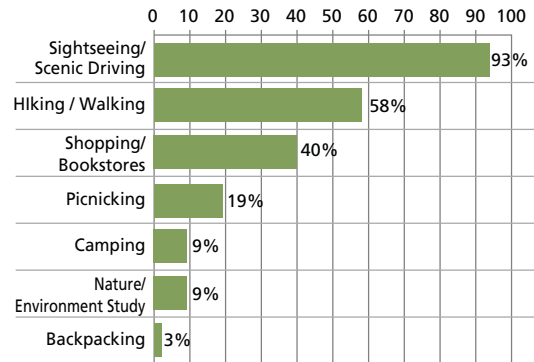


Visitation increased by about 0.9 percent per year since 2000, but has rather steady since 2004. Non-recreation trips have been steady over the same time period. Peak visitation months are May through September – accounting for 60% of annual visits. In June, July, and August, over 40,000 overnight stays occur within Zion National Park, a majority of which are camping overnight stays.



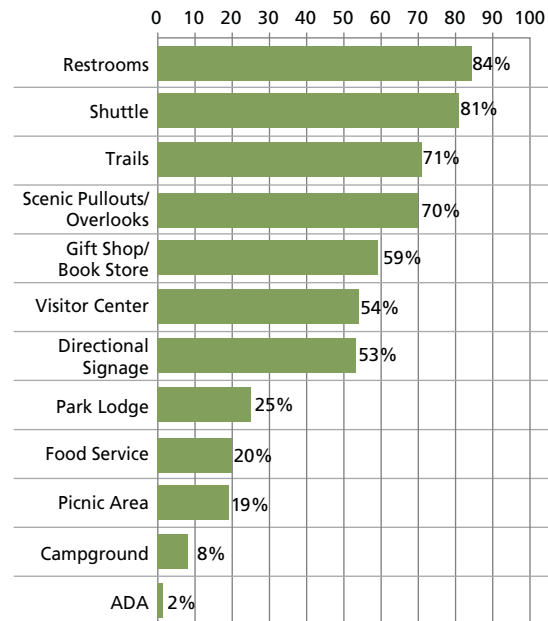
## ACTIVITIES

A majority of visitors participate in two activities, sightseeing/scenic driving and hiking/walking. Visitors also visit the bookstore, picnic, camp and bike within the park. Scenic driving/sightseeing is by far the primary activity within the park.



## VISITOR SERVICES USED

Visitors to Zion National Park use a variety of park services. Over eight in ten visitors use park restrooms and the shuttle system. A majority of visitors also use trails, scenic pullouts/overlooks, book stores and gift shops, the visitor center, and directional signage. About one in five visitors use the park lodge, park food services and picnic areas. Fewer than 5 percent of visitors use provided ADA facilities.



## CONGESTION AND THE VISITOR EXPERIENCE

Assessing the Visitor Experience, especially the transportation element, is a challenge for the NPS. Formal surveys of park visitors (the VSP survey) and staff (the CMS Survey), as well as informal surveys/interviews of park staff (the LRTP process) allow for some documented insight regarding how congestion affects the visitor experience.

- VSP, 2006, stated detractions/negative visitor comments: the crowds, lack of parking, road/tunnel construction, traffic
- 2010 CMS Survey – did not participate
- Staff Surveys & Interviews, 2011
  - Congested locations: parking congestion at South Entrance and on into Springdale;
  - Strategies: bicycle/pedestrian trail, wayfinding and signage, park website, Twitter, VMS, overflow parking lot near Visitor Center

## RESOURCE PROTECTION

Protecting park resources remains a strategic goal for NPS. This section of Baseline Conditions identifies the key resources in Zion National Park.

### AIR QUALITY AND GHG EMISSIONS

Mobile GHG Emissions	
Park Operations (MTCO <sub>2</sub> E)	1,577.0
Visitors (MTCO <sub>2</sub> E)	6,262.0
Concessionaires (MTCO <sub>2</sub> E)	153.9
Total Mobile GHG Emissions	6,415.9

*Climate Leadership In Parks*

The Park had completed an internal baseline assessment of mobile greenhouse gas (GHG) emissions. This assessment gives the park the opportunity to track the change in vehicle emissions over time.

### SIGNIFICANT RESOURCES

The purpose of Zion National Park is to:

- Preserve the dynamic natural process of canyon formation as an extraordinary example of canyon erosion.
- Preserve and protect the scenic beauty and unique geological features: the labyrinth of remarkable canyons, volcanic phenomena, fossiliferous deposits, brilliantly colored strata, and rare sedimentation.
- Preserve the archeological features that pertain to the ancestral Indian tribes and other historic features.
- Preserve the entire area intact for the purpose of scientific research and the enjoyment and enlightenment of the public.
- Provide a variety of opportunities and a range of experiences, from solitude to high use, to assist visitors in learning about and enjoying park resources without degrading those resources.

Zion National Park is unique in many ways. The park’s stunning scenery features towering, brilliantly colored cliffs and associated vegetation highlighted by a backdrop of contrasting luminous southwestern skies. The park is a geologic showcase with sheer sandstone cliffs—among the highest in the world. The Virgin River—one of the last mostly free-flowing river systems on the Colorado Plateau—is responsible for the ongoing carving of this deeply incised landscape. Zion National Park is home to a large assemblage of plant and animal communities. Zion National Park preserves evidence of human occupation from prehistoric to modern times, including American Indian sites, remnants of Mormon homesteading, and engineering and architecture related to park establishment and early tourism.





**THREATENED AND ENDANGERED WILDLIFE AND PLANT SPECIES.....**

Common Name	Species Name	Listing Category	Status in Park
WILDLIFE			
Bald Eagle	Haliaeetus leucocephalus	Delisted Monitored	Current
California Condor	Gymnogyps californianus	Occasional	Current
Desert Tortoise	Gopherus agassizii	Threatened	Current
American Peregrine Falcon	Falco peregrinus	Delisted Monitored	Current
Mexican Spotted Owl	Strix occidentalis lucida	Threatened	Current
Southwestern Willow Flycatcher	Empidonax traillii extimus	Endangered	Current
Virgin Spindace	Lepidomeda mollispinis mollispinis	Delisted	Current
Western Yellow-billed Cuckoo	Coccyzus americanus occidentalis	Candidate	Current
Brown Bear	Ursus arctos	Threatened	Historic
Gray Wolf	Canis lupus	Endangered	Historic
PLANT			
Shivwitz milk-vetch	Astragalus ampullarius	Endangered	Current

## SUSTAINABLE OPERATIONS

The emerging goal of sustainability is designed to support NPS resources and services for the long run. Like all national parks, Zion National Park is home to irreplaceable resources that must be managed effectively for the generations. Risks include potential temperature and precipitation shifts, the need to manage congestion, the risk to infrastructure from declining maintenance funds, and clean air.

..... • **REGIONAL AND COMMUNITY STAKEHOLDERS**

Zion National Park is located in southwest Utah near the St. George metropolitan area. Utah State Highways maintained by Utah DOT provide primary access to the park. Much of the land surrounding the park is managed by the federal government. The BLM manages most surrounding land including two Wilderness Study Areas to the east and south of the park. Dixie National Forest is also in the vicinity of the park.

<b>Regional Communities</b>	<ul style="list-style-type: none"><li>• Springdale, UT</li></ul>
<b>Regional MPOs</b>	<ul style="list-style-type: none"><li>• Dixie MPO (DMPO) – St. George, UT</li></ul>
<b>US Forest Service</b>	<ul style="list-style-type: none"><li>• Dixie National Forest</li></ul>
<b>US Bureau of Land Management</b>	<ul style="list-style-type: none"><li>• Canaan Mountain WSA</li><li>• North Fork Virgin River WSA</li><li>• Orderville Canyon WSA</li></ul>
<b>Indian Nations</b>	<ul style="list-style-type: none"><li>• Paiute</li></ul>
<b>Utah DOT (UDOT)</b>	<ul style="list-style-type: none"><li>• I-15</li><li>• US 89</li><li>• SH 9</li></ul>



## TRANSPORTATION RELATED PARTNERSHIPS .....

Partnerships have become a way to get things done both within and beyond park boundaries. Some NPS parks and programs operate almost exclusively through partnerships. Many of the parks established in the last twenty-five years have clear mandates to partner. Heritage areas and corridors, and national trails and rivers are partnership units. Ecosystem-based resource management requires close collaboration with the array of managers and stakeholders across the ecosystem.

### Existing Partnerships

<ul style="list-style-type: none"> <li>• The park is working with the town of Springdale to better orient visitors to the transportation system through improved wayfinding , signage, and messaging. The park will be making improvements to the park map and guide that identifies shuttle/flag stops in both the park and the town. The park continues to make improvements to signage located in transit bus and shuttle units.</li> <li>• Formal written agreements with key interested parties (Town of Springdale, UDOT, local businesses, etc.) would provide better guidance on the role and responsibility each partner has in the continued success of the shuttle operation along the town loop.</li> <li>• The park is working closely with Springdale in 2012 for funding that has been secured through the Federal Transit Authority to improve visitor wayfinding and information.</li> </ul>	
Zion National Park Foundation	<p>The Zion National Park Foundation is the fundraising arm of Zion Natural History Association. In just a few short years our generous donors have accomplished great things such as:</p> <ul style="list-style-type: none"> <li>-Historic Building Restoration</li> <li>-Natural Resource Research and Management</li> <li>-Youth Education</li> <li>-Historic Art Preservation</li> <li>-Promoting the Creation of Contemporary Art in the Park</li> </ul>

## CLIMATE FRIENDLY PARKS .....

Founded in 2003, the Climate Friendly Parks (CFP) program represents a partnership between the SOCC branch of Park Facility Management Division and the Air Resources Division. Zion National Park has obtained CFP certification.

### Transportation Related Strategies from Climate Change Action Plan

Program	Reduce fuel use and GHG emissions from employee and partner transportation
Project	Obtain alternative transportation for employees and NPS Partners; survey staff; encourage alternative scheduling; identify funding, operational costs, and incentives
Project	Employ alternative fuels (E-10 and B-20): find suppliers, funding source; educate public; improve vehicle efficiency
Project	Supply loaner bikes for employees: survey for interest; run test
Program	Reduce fuel use and GHG Emissions from Park Service Fleet
Project	Improve fleet management; increase use of flex fuel vehicles in fleet; continue vehicle sharing with other parks during off seasons; order new vehicles (hybrid, flex fuel, high-mpg) as needed
Program	Reduce fuel use and GHG emissions from Visitor Transportation
Project	Expand shuttle bus service: assess need/cost, identify options and funding sources
Project	Increase bicycle accessibility of park: explore ways to expand bike trails without threatening resources, explore feasibility of loaner bike program for visitors
Project	Reduce vehicle idling: issue entrance permits; swipe system at entrance stations; educate visitors to turn off cars while waiting

*Zion National Park Environmental Management System Template, March 2005*

.....PARK INTERVIEWS AND SELF-ASSESSMENT: SYNOPSIS

Park managers provided additional qualitative insight for three of the LRTP goal areas. Complete results of the July/August 2011 park manager survey is provided in Appendix A -Summary of Focus Park Interviews and Surveys: Addressing Visitor Experience, Resource Protection, and Sustainable Operations through Transportation.

#### VISITOR EXPERIENCE

- Capacity and Congestion
  - There is a high volume of visitors on buses pulling trailers with a frequency as high as every 6 minutes.
  - Park provides an escort service to over sized vehicles, both recreational and non-recreational, who exceed limits for oversized vehicles. This can create a negative impact to the park visitor who needs to wait in line for the oversized vehicle to exit before they can enter the tunnel.
- Parking
  - Parking congestion at the South Entrance can form lines of cars beyond the park boundary and into the town of Springdale, mostly during high traffic weekends and holidays. The park constructed an overflow parking lot near the Visitor Center to provide more parking capacity, partly relieving congestion at the South Entrance.
  - Limited parking is available in Springdale with shuttle service to the park. The park relies on the town to provide parking to serve the shuttle; however, parking near shuttle stops is inadequate. Local businesses do not like visitors parking in their lots and catching the shuttle into the park.
  - The Springdale route is not connected with Zion Canyon route and is a problem for visitors with disabilities. It is approximately a ¼ mile walk to transfer between Springdale shuttle and Zion Canyon Shuttle.
- ATS
  - The shuttle operates with 3 minute headways between shuttles. The shuttle company is in charge of its own maintenance for the fleet. Many of the shuttles are standing room only during the core months of operation. Riders per hour have increased from 45.53 in 2000 to 73.68 in 2010.
- ITS and Information Systems
  - Park continues to make improvements to signage located in transit bus and shuttle units in regards to the transportation system.
  - A digital display system for the hearing impaired was installed in 2009 that provides general park/shuttle information, shuttle stop locations, etc. The display is synchronized with an automated interpretive message heard by riders on both the bus and trailer units.
- Bicycles and Pedestrians
  - Bicycles are encouraged and popular, with bike racks on buses. There is not room to accommodate pedestrians on the road.

#### RESOURCE PROTECTION

- Resources at Risk
  - Animals biting people (result of increased access to the park).
  - When the shuttle system began operation, the number of animal/vehicle collisions was significantly reduced.
  - Social trailing radiates from shuttle stops in Zion Canyon and parallel to the river. This has been a consequence of dramatically improved transit services.
- Transit and Carrying Capacity
  - The park plans a research study with Utah State University to look at operation of the transit system in Zion Canyon as relates to visitor carrying capacity and resource impacts.

#### SUSTAINABLE OPERATIONS

- Policies
  - There is concern that for every \$20 the park receives as an entrance fee, \$8 goes to NPS. The park doesn't have enough control over transportation fees and how they are spent.
- Climate Change and GHG
  - The transit service provider has, at the request of the park, implemented an idle reduction policy to reduce fuel consumption, vehicle emissions, and noise levels.
  - As technology advances and prices lower, the park would like to employ a fleet of electric powered vehicles. Electric bus units are currently cost prohibitive nor able to make the steep canyon road grade pulling a trailer unit. The transportation fleet is currently fueled with propane - an alternative fuel type. The park conducted a fuel type analysis in 2009 as part of its fleet replacement effort and as a result of that study have meet with biodiesel and ultra low sulfur diesel distributors. Due to the excessive cost of adding infrastructure to operate a mixed fuel fleet the park has decided in the interim to continue with its current fuel type.

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## CHAPTER 5 - DATA AND OTHER INFORMATION GAPS

This long range transportation plan process is hampered by several data gaps and inconsistencies. As a pilot plan, it identifies several areas that should be addressed in future updates including: consistent asset database reporting and interconnectivity, parking and congestion data management, transportation trails, bicycle and pedestrian facilities, resource risk analysis, and regionally consistent sustainable operations reporting.

URS collected limited asset data for each park in the Intermountain Region. For the most part, data was aggregated at the regional level. Additional detail was made available for the 12 focus parks, which were analyzed individually and reported in Chapter 4 – Transportation System: 12 Focus Parks.

Several data gaps were identified during the analysis of baseline conditions and are grouped in the following table by the five transportation planning goal areas which form the principal basis for the organization of this report.

The resolution of these data gaps will increase the accuracy and level of detail for subsequent updates to the IMR LRTP.

**Data Gaps and Information Needs by LRTP Goal Area**

Data Gap	Description	Examples and Questions
<b>Asset Management</b>		
Asset database updates and integration	Complete Roadway Inventory Program (RIP), Bridge Inventory Program (BIP), and Facility Management Software System (FMSS) for all park units in the region (reported in Phase 1 Data Collection, DEA, February 2010). The databases for RIP, BIP, and FMSS should be standardized to simplify their interface.	<p>NPS and FHWA have been working to resolve the differences in reported pavement condition in FMSS and RIP/BIP, but not yet completed required changes.</p> <p>The problem is readily apparent in the application of both systems to the potential decommission or removal of underutilized or poor condition facilities.</p> <p>The reporting systems yield sometimes conflicting information and contribute to a perceived lack of transparency in the decision making process.</p>
Other transportation assets	Incomplete or unreliable data hampers comprehensive data analysis to support DM and CRV.	<p>For example, FMSS lists 1,541 signs as missing or unreadable. Participants in the planning process believe this to be inaccurate.</p> <p>WASO is working to improve process to track walls, guardrails, signs, and other assets.</p>
GIS integration	DEA (and URS) further noted an inability to integrate FMSS data into the GIS environment, and the inability to link/integrate the FMSS datasets to other datasets like the Roadway Inventory Program (RIP), the Bridge Inspection Program (BIP), and the Project Management Information System (PMIS).	For example, RIP data features Route ID numbers which are not included in the FMSS road and parking area asset data, which hinders cross-referencing.
Vehicle counts	The relationship between use and condition is not readily apparent from the data. Better documentation of the level of use of transportation facilities as compared to condition will assist in identifying appropriate assets for decommission.	<p>Traffic counts are typically completed at the park level and not uniformly reported regionally. Recommend that all traffic counts conducted by parks are reported to WASO-monitored databases in a consistent format on a regular schedule. Problems are reported with reliable function of existing counters and should be corrected.</p> <p>Existing permanent counters in focus parks:            GLAC – 3 counters, all functioning            GRCA – 3 counters, all functioning            MEVE – 1 counter, functioning            SAGU – 3 counters, 2 functioning            ROMO – may be added in future            YELL – 4 counters, all functioning</p>
Parking area utilization	A consistent method of reporting parking utilization will assist in identifying existing and future needs.	This issue is similar to roadway and vehicle analysis and is also typically completed at the park level and generally for congested areas only. Consistency of reporting parking area utilization and turnover would assist in identifying high priority needs and in linking general congestion to spot congestion.
Deferred Maintenance and Facility Condition Index	URS consultants (DEA and URS) found that the quality of data is directly related to how recently park staff has updated the data. The FCI value is generated by dividing Current Replacement Value (CRV) by Deferred Maintenance (DM). FCI can be unreliable because of inaccurate DM values.	Evaluate the current methodology for identifying DM values in the FMSS and revise methodology accordingly to avoid inaccurate or outdated DM and FCI values.



**Data Gaps and Information Needs by LRTP Goal Area, continued**

Data Gap	Description	Examples and Questions
<b>Mobility, Access, and Connectivity</b>		
Transportation trails for all parks	Data (and policies) to support a comprehensive assessment of non-motorized transportation trails led to a less than satisfactory treatment of trail condition, service levels, and potentially, needs.	<p>Improve Transportation Trail criteria, delineation, and categorization of transportation trails.</p> <p>For all asset categories (including Trails), develop a consistent format for GIS data so that information can be combined for the park units across the entire IMR.</p> <p>Consider including “recreational trails” as part of the multimodal transportation system for the 1st LRTP update. However, data to support such an effort is not currently readily available.</p> <p>Trail data points should include at a minimum CRV, DM, surface type, condition, date of installation, date of last improvements, length, and purpose of trail.</p>
Traffic volumes	Data to support vehicle Level of Service, congestion/capacity, and crash rates is dependent on good traffic counts. Such counts are not universally available across the system. While permanent counters are available at some parks, they do not give comprehensive coverage and are often based on vehicle counts at entrance stations modified by outdated vehicle occupancy rates. See Visitor Counts in next section.	<p>More consistent region-wide data may be available through NPS and FHWA for the 1st update. However, some substitute methods may be employed to assist the process:</p> <ul style="list-style-type: none"> <li>• NPS is exploring the use of cell phone tracking technology that could provide a wealth of information about travel patterns, including routes used, time in park, average speed, entrance/exit used, etc.</li> <li>• Other agencies may be able to provide assistance by making available traffic counts, vehicle occupancy, vehicle type, etc. on state highways through or approaching the parks. Local route information may be available from adjoining MPOs, counties, or municipalities.</li> </ul>
Vehicle crash data	The most recent crash data available at the regional level for this LRTP dates from 2005.	Develop process to update regional crash statistics on a more frequent basis.
Transit fleet not tracked centrally	Each transit system is currently tracked at the park level. Recapitalization costs have a large bearing on future needs.	All transit systems should report capital and operations data to WASO so as to improve long range cost estimates. Operational data should include miles/costs per rider, maintenance costs, and ridership.
Intelligent Transportation Systems	A better understanding of the cost-benefit ratio of ITS applications, with respect to congestion management and resource impacts, will assist the Intermountain Region in making cost-effective investments	ITS has been implemented in some form at Bryce, Glacier, Grand Canyon, Grand Teton, Rocky Mountain, Yellowstone, and Zion. A composite analysis of the effectiveness will assist in determining appropriate future investments.

Data Gaps and Information Needs by LRTP Goal Area, continued

Data Gap	Description	Examples and Questions
Visitor Experience		
Visitor Counts	<p>Develop consistent and updated visitor counts, including vehicle occupancy rates, and for recreational and non-recreational trips. Methodology changes over time and equipment failures provide an array of statistics that delivers a contradictory or anomalous assessment of visitation.</p> <p>Develop consistent vehicle counts at critical or congested locations</p>	<p>The relationship of visitation to demand for services is not clearly understood. Certain focus parks exhibit anomalies in counts making it difficult to understand long term trends. Short-term changes in visitation at the regional level and at individual parks are probably much less meaningful than long term trends, which are less clearly understood. Significant changes in visitation rates at Grand Teton, San Antonio Missions, Chickasaw, Zion, Yellowstone, and parks along the Mexico border are not well understood.</p> <p>Visitor count methods change with time and may affect documented growth rates over certain periods of time. Individual park visitation rates will become normalized over time as longer time periods are incorporated in the analysis.</p>
Non-Rec Visitation Type of Use	Non-recreation visitation should focus on the type of use. (Include vehicle occupancy rates.)	<p>Focus parks including Saguaro, Grand Teton, and Chickasaw with high non-recreation rates (variable over time) do not clearly identify vehicle throughput for commuting or other local uses that are distinctly non-park related.</p> <p>See Traffic Volumes under the Mobility, Access, and Connectivity heading.</p>
Visitor experience surveys	An impressive catalogue of visitor experience survey responses is documented by park in University of Idaho surveys.	Recommend "mining" this data for themes that are applicable across park boundaries and especially at the regional level. Such information will help establish baseline performance that can be tracked over time.
Relationship of transportation to visitor experience	The effects of transportation, including congestion on roadways and shuttles, roadway condition, safety, vehicle/wildlife crashes, etc. remains largely unstudied.	<p>The tolerance for negative impacts, as well as the benefits, of transportation is little understood with respect to visitation and overall visitor choices. The NPS could consider adding more questions targeted to transportation to the existing University of Idaho survey project or develop studies to directly explore the relationship. The research could include some follow-up to previous efforts related to the limits of acceptable change.</p> <p>See Maintaining the Quality of Park Resources and Visitor Experiences; Anderson, et. Al.; University of Minnesota; 1998; The Visitor Experience and Resource Protection Framework; NPS; 1997; and Visitor Experiences and Transportation Systems in Yosemite National Park; White, et. al.; Arizona State University; 2006.</p>

**Data Gaps and Information Needs by LRTP Goal Area, continued**

Data Gaps	Description	Examples and Questions
Resource Protection		
Interface of transportation system with at-risk cultural and natural resources	Endangered species/habitat	Participants in the planning process noted the lack of consistent data reportable at the regional level. Some individual parks have completed extensive surveys and studies in the subject areas. However, drawing reasonable conclusions at the regional level is difficult, at best.
	Wildlife migration corridors and habitat	<p>Many park managers cite severe impacts to both mega and micro fauna. However, reliable records are thin. For example, while crash histories are readily available for impacts with large animals like deer and elk, other wildlife fatalities may go unreported, at least at the regional level.</p> <p>A Western Transportation Institute initiative under separate contract promises to upgrade mapping that could be adapted to the regional scale. However, the current Roadkill Observation Collection System (ROCS) is currently focused as tool at the park level.</p>
	Wetlands and floodplains	Other integrated GIS-based tools are in development that access databases across state and federal agencies that can be configured to work at larger scales. (See WISDOM.com, a promising application in Wyoming)
	Cultural Resource Impact Areas	<p>The transportation relationship with designated Cultural Resource Impact Areas and other culturally significant maintained landscapes should be further documented and explored in the 1st update.</p> <ul style="list-style-type: none"> <li>• Include inventory of all LCS transportation-related assets for all parks as an appendix.</li> <li>• Compare LCS asset condition to other asset condition.</li> <li>• Calculate dollar amount of needs for all LCS transportation-related assets.</li> </ul>

**INTERMOUNTAIN REGION**  
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**Data Gaps and Information Needs by LRTP Goal Area, continued**

<b>Data Gaps</b>	<b>Description</b>	<b>Examples and Questions</b>
<b>Sustainable Operations</b>		
Total cost of operations	Financial sustainability is heavily dependent on accurate life cycle cost estimates.	Data needs include: <ul style="list-style-type: none"> <li>• average cost per mile to maintain roadway and parking area pavements for all classifications</li> <li>• long term culvert and other drainage costs</li> <li>• transit recapitalization</li> </ul>
Partnership financial support	Relationship of demographic changes to park use and financial support	Consistent and complete data is lacking on the sum and type of all partnership support. This will become more critical in the future, especially if NPS budgets continue to lag demonstrated need.
Community connections	Long term viability of the NPS depends, in part, upon strong community and regional connection.	Community connections includes physical connections as well as financial support (see above). A comprehensive survey of multimodal connectivity would enhance the understanding of how parks can successfully integrate with the larger community. Pedestrian, bicycle, transit, aviation, rail, and communications linkages should be explored.
Detailed risk analysis based on a national framework	Climate change	Climate change – While micro-scale analyses of the effects of climate change over the long term are beginning to become available at the park scale, projected regional effects are very general. The IMR should consider producing a regional framework to catalogue and address the effects of climate change including an assessment of potential impacts by habitat type and longitude/latitude. <ul style="list-style-type: none"> <li>• Consider development of a Regional Climate Change Action Plan with the following elements: <ul style="list-style-type: none"> <li>- Complete Climate Friendly Park/Climate Change Action Plans for all parks.</li> <li>- Establish performance targets at the regional level.</li> <li>- Develop aggregate emissions output for tracking purposes.</li> </ul> </li> </ul>
	Severe weather events	Weather – The potential for severe weather events and their costs are similarly little understood. Locational risks by type, management costs, planning, and design implications should be better understood and incorporated in asset management strategies.
	Wildfire	Wildfire – Document the extent of risks, effects of altered landscapes on visitor experience, effects on habitat, and management costs.
Transportation carrying capacity	Some parks are congested to the point of exceeding the ability of the system to satisfy existing or projected demand.	Research into the ability of transportation to absorb demand within responsible financial and resource protection limits should be explored. Sustainable operations may include demand management techniques such as reservation systems.
Alternative funding guidelines	Comprehensive information regarding the application of alternative funding mechanisms to NPS transportation operations, maintenance, and capital expenses will assist program managers in identifying realistic funding opportunities.	Database - IMR contributing partners with value of contribution, limits on expenditures, agency contacts.  Document local funding mechanisms including special districts, bonds.