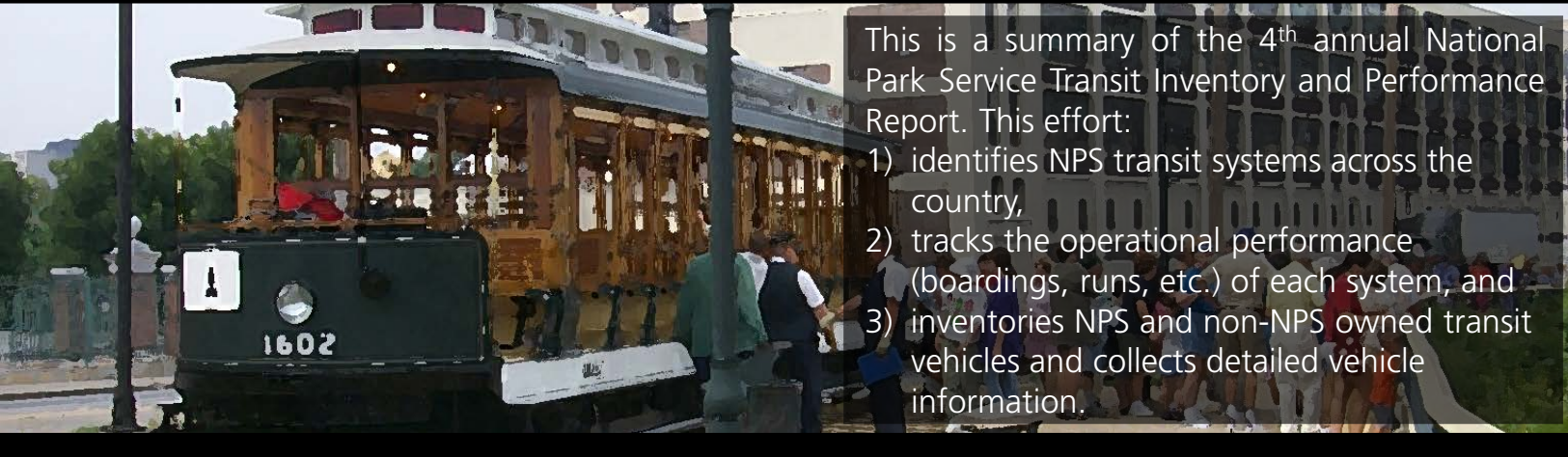


NPS National Transit Inventory and Performance Report, 2015





This is a summary of the 4th annual National Park Service Transit Inventory and Performance Report. This effort:

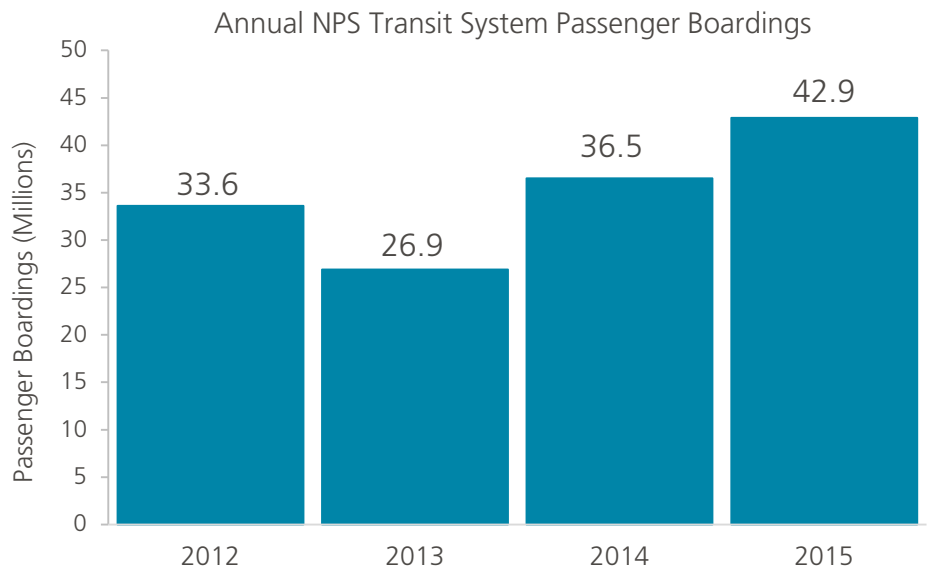
- 1) identifies NPS transit systems across the country,
- 2) tracks the operational performance (boardings, runs, etc.) of each system, and
- 3) inventories NPS and non-NPS owned transit vehicles and collects detailed vehicle information.

64 Parks Represented

127 Transit Systems

42.9 Million Passenger Boardings

1,022 Vehicles



- In 2015, 127 transit systems operated in 64 of the 413 National Park Service units.
- Total passenger boardings across all systems were 42.9 million.
- NPS transit systems can mitigate emissions if NPS transit vehicles are, on average, at least 40 percent occupied.
- Of the 127 systems, NPS owned and operated 20 systems with 275 vehicles. NPS transit vehicles have an estimated \$39 million in recapitalization needs between 2016 and 2027.

Business Model (by # of transit systems)

Mode (by # of transit systems)

Purpose (by # of transit systems)

Service Contract 9%

Snowcoach 2%

Transportation Feature 5%

Special Needs 2%

Interpretive Tour 39%

Cooperative Agreement 12%

Train, Trolley 3%

Critical Access 26%

NPS Owned & Operated 16%

Concession Contract 63%

Boat, Ferry 32%

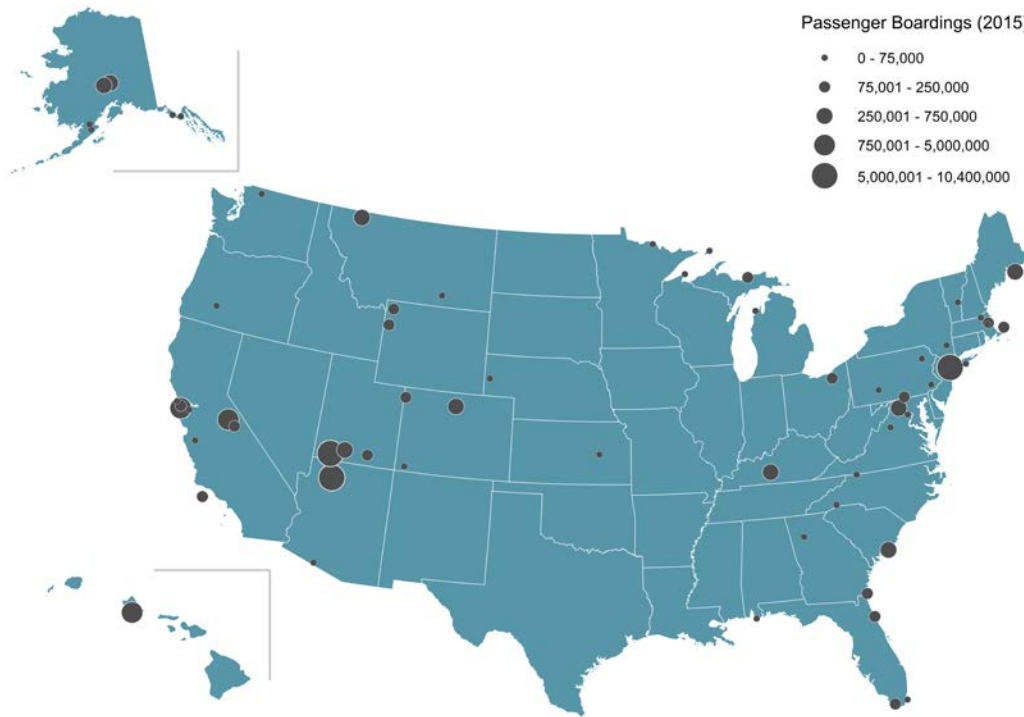
Shuttle, Bus, Van, Tram 51%

Mobility to or Within Park 28%



NPS leverages the private sector to provide the majority of transit services. 107 (84%) of NPS transit systems are operated by a non-NPS entity under an agreement or contract. These systems account for almost 99% of passenger boardings service-wide. The remaining 20 (16%) of transit systems are owned and operated by NPS and account for the remaining 1% of boardings.

NPS continues partnerships with local transit agencies. 13 systems are operated by a local transit agency under a specific agreement with NPS. NPS shares the operations and maintenance costs of several of these systems. This is an increase of one system compared to 2014.



Performance Measures

The majority of the NPS-owned transit system vehicles are accessible for people with mobility impairments. A total of 68.7% NPS-owned vehicles are accessible to people with mobility impairments (e.g. require wheelchair lift), while 31.3% are not accessible.

A higher percentage of NPS-owned vehicles operate on alternative fuel compared to non-NPS transit vehicles. 60.4% of NPS-owned vehicles operate on alternative fuel, while 16.8% of non-NPS-owned vehicles operate on alternative fuel.

NPS transit systems mitigate vehicle emissions. Vehicle data was available for 54 shuttle/bus/van systems to calculate emissions. If NPS transit vehicles are on average at least 40% occupied, then NPS transit systems mitigate—rather than contribute—greenhouse gas emissions.

NPS faces nearly \$40 million in vehicle recapitalization needs in the next ten years. NPS-owned shuttle/bus/van/tram vehicles have an estimated \$3.9 million in overdue recapitalization costs and \$38.7 million in recapitalization needs between 2016 and 2027. Parks with estimated transit vehicle replacement costs over \$1 million during the next ten years are: Adams National Historical Park, Glacier National Park, Grand Canyon National Park, Harpers Ferry National Historical Park, Yosemite National Park, and Zion National Park.

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Acronyms

The following acronyms are used in this report:

AKR	Alaska Region
ATP	Alternative Transportation Program
ATSLAM	Alternative Transportation Systems Lifecycle Asset Management
BISC	Biscayne National Park
BOHA	Boston Harbor Islands National Recreation Area
CHIS	Channel Islands National Park
CO ₂	Carbon Dioxide
EVER	Everglades National Park
FBMS	Financial and Business Management System
GLAC	Glacier Bay National Park
GLCA	Glen Canyon National Recreation Area
IMR	Intermountain Region
MABI	Marsh-Billings-Rockefeller National Historic Park
MAP-21	Moving Ahead for Progress in the 21 st Century
MWR	Midwest Region
NAMA	National Mall and Memorial Parks
NCR	National Capital Region
NER	Northeast Region
NPS	National Park Service
PWR	Pacific West Region
SER	Southeast Region
SOCC	Sustainable Operations and Climate Change
TAPR	Tall Grass Prairie National Preserve
TRIP	Paul S. Sarbanes Transit in Parks Program
VALR	Valor in the Pacific National Monument
VMT	Vehicle Miles Traveled
YOSE	Yosemite National Park



Introduction

The fourth annual National Park Service (NPS) Transit Inventory and Performance Report communicates the service-wide outcomes and status of NPS transit systems (see Appendix A for acknowledgements). The 2012 inventory¹ was the first comprehensive listing of these systems since 1998, covering surface, waterborne, and air systems. The 2012 inventory established a working definition of NPS transit systems for the purpose of this document; helped NPS comply with 23 U.S Code 203(c),² which requires “a comprehensive national inventory of public Federal lands transportation facilities;” and, fulfilled other internal needs.

The 2015 inventory is meant to assist the NPS:

- Advance NPS transit performance measurement;
- Capture asset management and operational information not captured by current NPS systems of record;
- Supports the Green Parks Plan, the National Long Range Transportation Plan, Regional Long Range Transportation Plans, A Call to Action, and the Capital Investment Strategy by providing key transit statistics, which can also be used to track progress towards goals;
- Integrate transit data with NPS systems of record, including asset management data in the Facility and Business Management System for NPS-owned vehicles;
- Comply with Executive Order 13514, which requires federal agencies to measure, manage, and reduce greenhouse gas emissions; and
- Communicate program information and projected vehicle (but not infrastructure) recapitalization needs internally and externally.

Data Collection and Methodology

The NPS has used the same objective definition of NPS transit systems for the transit inventory since 2012 to ensure consistent data collection across the nation and over time. Only units with systems that meet each of the following three criteria are included in this effort (see Appendix B for more information):

1. Moves people by motorized vehicle on a regularly scheduled service;³
2. Operates under one of the following business models: concessions contract; service contract; partner agreement including memorandum of understanding, memorandum of agreement, or cooperative agreement (commercial use authorizations are not included); or NPS-owned and operated;⁴ and
3. All routes and services at a given unit that are operated under the same business model by the same operator are considered a single NPS transit system.

¹ NPS National Transit Inventory, 2012. http://ntl.bts.gov/lib/47000/47800/47871/NPS_WASO_2013_Transit_Inventory.pdf

² 23 U.S. Code 203 Federal lands transportation program: <https://www.gpo.gov/fdsys/pkg/USCODE-2014-title23/pdf/USCODE-2014-title23-chap2-sec203.pdf>

³ Services with a posted schedule that have standard operating seasons/days of week/hours. Services which do not operate on a fixed route, or exist for the sole purpose of providing access to persons with disabilities, are not included.

⁴ For the purposes of the NPS transit inventories, no distinction is drawn between memorandum of understanding, memorandum of agreement, and cooperative agreement. All are recorded as “cooperative agreement.”



The 2015 NPS Transit Inventory is limited to systems in which the NPS either has a direct financial stake or has committed resources to develop a formal contract or agreement.

The majority of systems tend to collect information on a calendar year cycle (January through December), therefore the following information was collected for the 2015 calendar year:

- Transit system name and description;
- Passenger boardings;
- Business model;
- System purpose;
- System type/mode;
- Vehicle information including fuel type, capacity, service miles, accessibility, and age (individual vehicle information for NPS-owned vehicles and system-level information for non-NPS vehicles);
- Vehicle information that is mandatory in the NPS's Financial and Business Management System (FBMS);
- Owner and operator type (NPS or non-NPS) and contact information; and
- Participation of a local transit agency in the service.

The following steps were taken to update the inventory:

- Using the 2014 National NPS Transit Inventory as a starting point, regional transportation program coordinators identified new, closed, or consolidated systems, and updated unit contact information.
- 64 park units were contacted to collect information, primarily using an online form, or through email or phone. Some parks reported incomplete information because they do not track the requested service information or they could not provide the information before the end of the data call. All units responded except for two,⁵ although some units did not report data for all of their systems.⁶
- Data collection efforts were coordinated with known data sources, such as FBMS and the 15 Transportation Fee Parks, to avoid duplicate data calls for park staff.

Appendix D includes a full list of surveyed transit systems by region.

⁵ Wolf Trap National Park for the Performing Arts did not provide data for the Fairfax Connectors Wolf Trap Express. Glacier Bay National Park (GLBA) did not report data for the airport shuttle or day boat tour.

⁶ Several units provided data for some systems at their park, but not all. These non-reporting systems include: Sailors Haven Ferry at Fire Island National Sea Shore and the Yellowstone National Park snow coach system operated by Gary Fales Outfitting Inc.



Inventory Results

Detailed findings of the 2015 inventory are presented in the following sections:

- Inventory Base-Data
- System Characteristics
- Passenger Boardings
- Vehicle Data
- Performance Measures

Inventory Base-Data

Table 1 summarizes the differences in key findings of the NPS National Transit Inventory and Performance Report results from 2012 through 2015.

Table 1: NPS transit systems changes between 2012 and 2015 inventories

Source: 2012 - 2015 NPS National Transit Inventory data

Key Findings	2012	2013	2014	2015
Number of Systems	147	131	121	127
Number of Parks Represented	68	66	63	64
Passenger Boardings	33.2 million	26.9 million	36.5 million	42.9 million
<i>Excluding 10 highest ridership systems</i>	6.1 million	5.9 million	5.6 million	7.2 million
Number of Vehicles	890	927	982	1,022
<i>NPS-Owned</i>	323	278	274	275
<i>Non-NPS</i>	567	651	708	747
Systems operated by Local Transit Agency	12	12	12	13

Three systems were not active or discontinued in 2015. The Biscayne (BISC) National Underwater Park Tour was not active due to contracting issues, and may commence service in 2017 under a new concessions contract. The Yosemite National Park (YOSE) Big Trees Tram Tour (Mariposa Grove Tram) was discontinued at the end of 2014 due to the rehabilitation of the Mariposa Grove. The Marsh-Billings-Rockefeller National Historical Park (MABI) Full Circle Trolley was a pilot project and was discontinued at the end of 2014.

Two new systems were added to the inventory in 2015, the DC Circulator at the National Mall and Memorial Parks (NAMA), and the Key West Sea Plane Adventures at Everglades National Park (EVER). Three systems resumed service in 2015: the Boston Lighthouse Tour at the Boston Harbor Islands National Recreation Area (BOHA); the Antelope Point ferry at the Glen Canyon National Recreation Area (GLCA); and the Tall Grass Prairie National Preserve (TAPR) shuttle bus. Additionally, existing systems at Yellowstone (YELL) were reclassified, accounting for four additional systems in 2015.

There was an approximately 17.5 percent increase in passenger boardings between 2014 and 2015. This increase was led by boarding increases on the Zion National Park Canyon Shuttle (1.3 million additional boardings) and on the World War II Valor in the Pacific National Monument's (VALR) USS Arizona



Memorial Tour (1.6 million additional boardings). It is important to note that more accurate passenger boarding data may have contributed to the increase as well.⁷

Five systems did not provide updated 2015 data. Those systems are excluded from any operations-related information presented (e.g. passenger boardings, service miles), but are included in general inventory data, since the vehicle type, system purpose, and business model did not change.

⁷ Due to a discrepancy, Channel Islands National Park (CHIS) underreported its 2014 passenger boarding data.



System Characteristics

The 2015 inventory identified 127 discrete transit systems throughout 64 of the total 413 NPS units. Figure 1, Figure 2, and Figure 3 place these systems in the context of primary system purpose, mode, and business model. Results for system characteristics in 2015 are similar to the results reported previously in 2014.

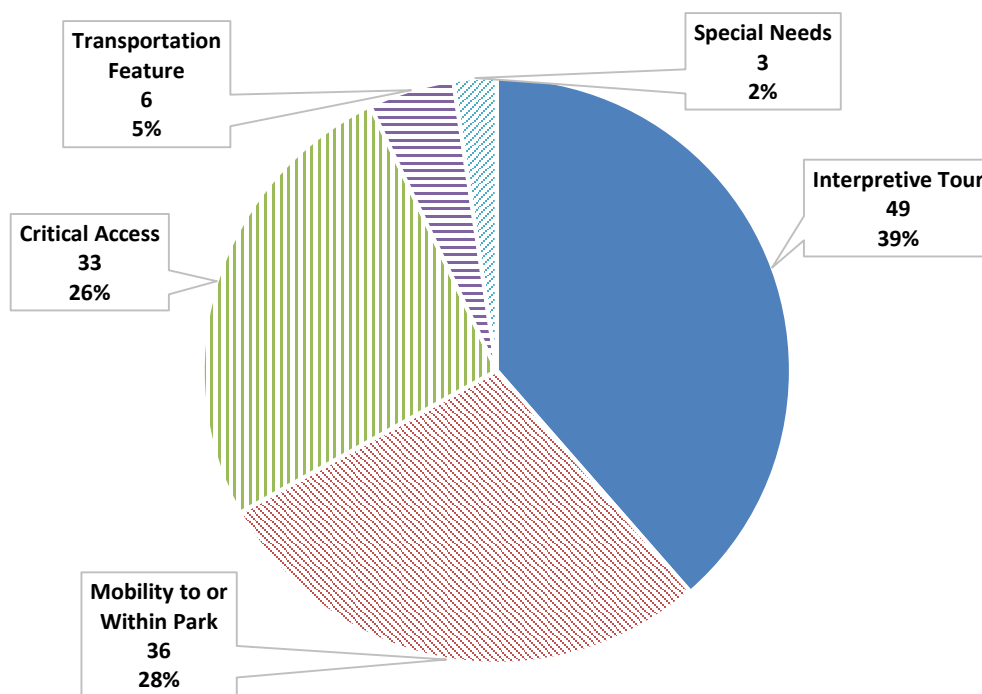
System Purpose & Mode

There are five purposes identified for transit systems and unit staff identified which one was the primary purpose for each system. Although transit systems often provide multiple purposes, unit staff identified the primary purpose of each system. System purposes are described below and depicted in Figure 1.

- 49 systems are guided **interpretive tours**;⁸
- 36 systems provide **mobility to or within a park** as a supplement to private automobile access;
- 33 systems provide **critical access** to an NPS unit or site that is not readily accessible to the public due to geographic constraints, park resource management decisions, or parking lot congestion;
- 6 systems are considered a **transportation feature** (a primary attraction of the park unit); and,
- 3 systems meet the accessibility needs of visitors with **special needs**.

Figure 1: Systems by primary purpose
(N=127 systems)

Source: 2015 NPS National Transit Inventory data



⁸ In 2016, the definition of interpretative tours will be further refined to determine if all systems fit within the definition of transit used for the report.

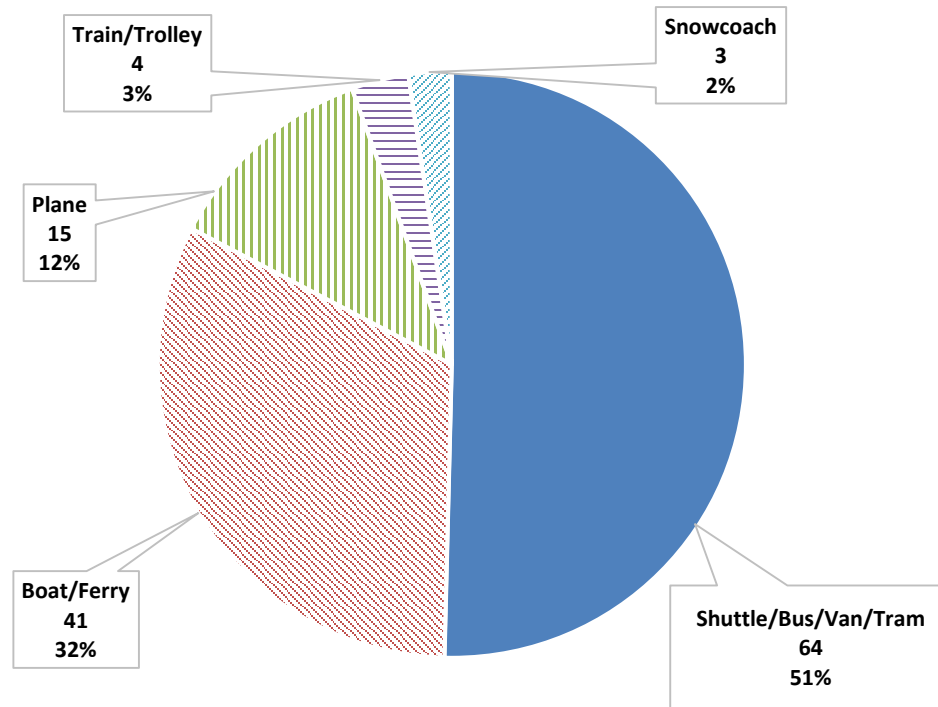


The majority of the transit systems are shuttle/bus/van/tram systems (51 percent), followed by boat/ferry (32 percent), plane (12 percent), trains/trolley (3 percent), and snowcoach (2 percent) (see Figure 2).

Figure 2: Systems by mode

(N=127 systems)

Source: 2015 NPS National Transit Inventory data



Business Models

There are four types of business models under which the 127 NPS transit systems operate, as shown in Figure 3.

- **Concession Contracts:** The majority of identified transit systems, 80 systems, operate through concession contracts under which a private concessioner pays the NPS a franchise fee to operate inside a unit. Seven concession contract systems utilize vehicle fleets owned by the NPS.
- **Service Contracts:** Transit systems that are primarily owned and operated by a private firm fall under service contracts. In 2015, 12 transit systems operated under a service contract. Five service contract systems utilize vehicle fleets owned by the NPS.
- **Cooperative Agreement:** A local government agency or nonprofit operated 15 of the transit systems under a cooperative agreement.
- **NPS Owned and Operated:** The NPS owned and operated 20 of the park transit systems.⁹ These systems tend to be small and provide critical access to a park or park site, are interpretive tours,

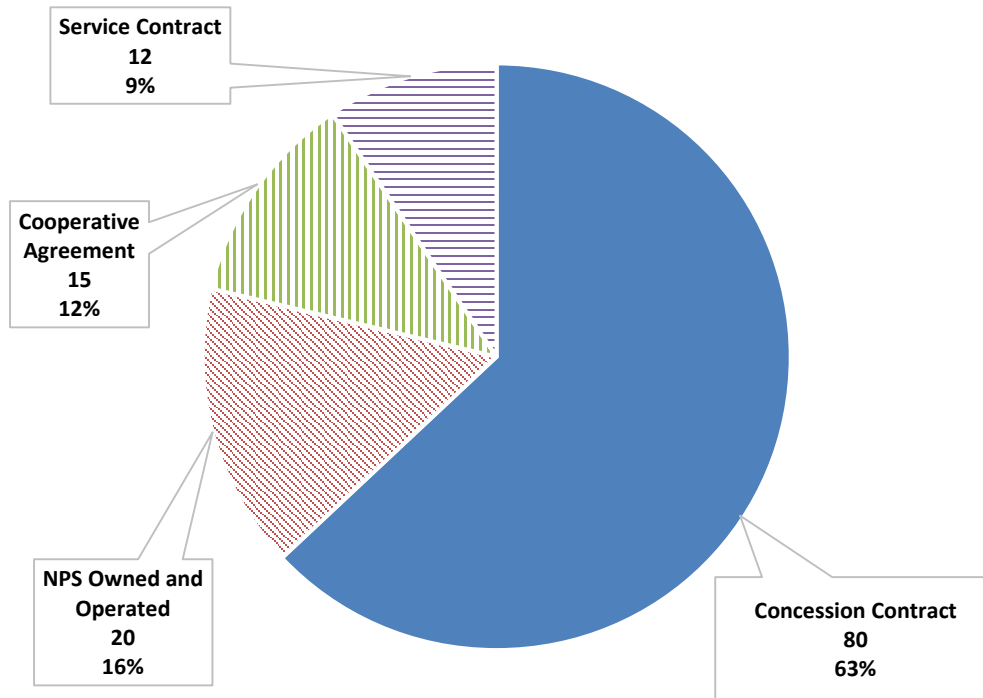
⁹ In total, the NPS owns vehicle fleets for 34 systems, operating 20 of those systems. The remaining systems are operated through concessions agreements (7), cooperative agreements (2), and service contracts (5).



provide service for special needs visitors, or are a park transportation feature not easily provided by a private operator.

Figure 3: Systems by business model
(N=127 systems)

Source: 2015 NPS National Transit Inventory data



Passenger Boardings

In 2015, there were 42.9 million passenger boardings across all NPS transit systems.¹⁰ If the 127 identified systems were considered one enterprise compared to transit agencies across the country in the National Transit Database, that enterprise would rank 34th in the country in terms of passenger boardings.¹¹ Excluding concession contracts and cooperative agreements, NPS owned and operated systems and service contract systems reported 15.5 million trips in 2015.

Table 2 summarizes the methodologies park units use to count boardings. Systems indirectly record most passenger boardings through ticket sales (19.5 million) and manual counts (18.7 million). Estimated and automated counter methodologies comprised approximately 4.0 million passenger boardings.

¹⁰ A “passenger boarding” or “unlinked trip” occurs each time a passenger boards a vehicle. This is an industry standard measure used in the Federal Transit Administration’s National Transit Database.

¹¹ Federal Transit Administration National Transit Database, 2015 data. <http://www.ntdprogram.gov/ntdprogram/>



Table 2: Count methodology**(N = 122 systems¹²)**

Source: 2015 NPS National Transit Inventory data

Count Methodology	Number of Systems	Passenger Boardings (Millions)
Ticket Sales	50	19.5
Manual Counts	58	18.7
Estimated	6	3.9
Automated Counter	2	0.1
Other	6	0.7

Approximately 83.3 percent (35.7 million) of boardings on NPS transit systems in 2015 are attributable to the 10 highest use transit systems (by boardings). Table 3 summarizes these systems and shows passenger boardings for 2015. Passenger boardings increased in 2015 for all of the top 10 systems.

Table 3: Passenger boardings for the 10 highest use transit systems

Source: 2015 NPS National Transit Inventory data

Rank	Park	System Name	2015 Boardings	Business Model	System Purpose
1	STLI/ELIS	Statue of Liberty Ferries	10,343,634	Concession Contract	Critical Access
2	GRCA	South Rim Shuttle Service	7,419,961	Service Contract	Mobility to or within park
3	ZION	Zion Canyon Shuttle	5,297,860	Service Contract	Critical Access
4	YOSE	Yosemite Valley Shuttle	3,620,623	Concession Contract	Mobility to or Within Park
5	GOGA/ALCA	Alcatraz Cruises ferry	3,390,850	Concession Contract	Critical Access
6	VALR	USS Arizona Memorial Tour	2,673,896	Cooperative Agreement	Critical Access
7	NAMA	Big Bus Tours Washington DC ¹³	1,092,049	Concession Contract	Interpretative Tour
8	SAJU	San Juan Trolley	739,891	Cooperative Agreement	Mobility to or Within Park
9	ROMO	Bear Lake & Moraine Park shuttle, Hiker Shuttle to Estes Park	577,029	Service Contract	Critical Access
10	VALR	Ford Island Tour	552,433	Service Contract	Interpretive Tour

¹² An N of 122 is used to exclude the five systems that did not provide boarding information for 2015

¹³ In 2014, the Volpe Center completed a study on passenger boardings for NAMA Big Bus Tours Washington, DC. Using the multiplier found in the study, the corrected 2014 boardings are 1,292,372. The multiplier was used to calculate 2015 boardings.



High-ridership shuttle systems are primarily provided via service contracts, while a greater proportion of the high-ridership water-based systems are provided through concession contracts. This likely reflects a greater business case for bidding out specialized water-based systems to concessioners. In many cases, these systems provide critical access to parks and park sites. High-ridership systems are located primarily in the NPS Intermountain, Northeast, and Pacific West Regions.

The number of cooperative agreements with local transit agencies increased from 12 systems in 2014 to 13 systems in 2015 with the introduction of DC Circulator service to the National Mall. Those partnerships accounted for 5.7 million passenger boardings in 2015. Passenger boardings among NPS owned and operated systems (20 systems) accounted for approximately 636,000 passenger boardings. Most of these systems either provide critical access to a unit/site or an interpretive experience for visitors.

The Intermountain and Northeast NPS regions each reported slightly more than 13 million passenger boardings in 2015, far exceeding other regions; however, if one were to remove the ten highest use systems from consideration, each region ranged from 400,000 to 1.8 million passenger boardings in 2015

Figure 4 shows the geographic distribution of the systems, along with the passenger boardings, and Figure 5 shows passenger boardings by region.



Figure 4: System locations and passenger boardings
(N=121 systems)

Source: 2015 NPS National Transit Inventory data

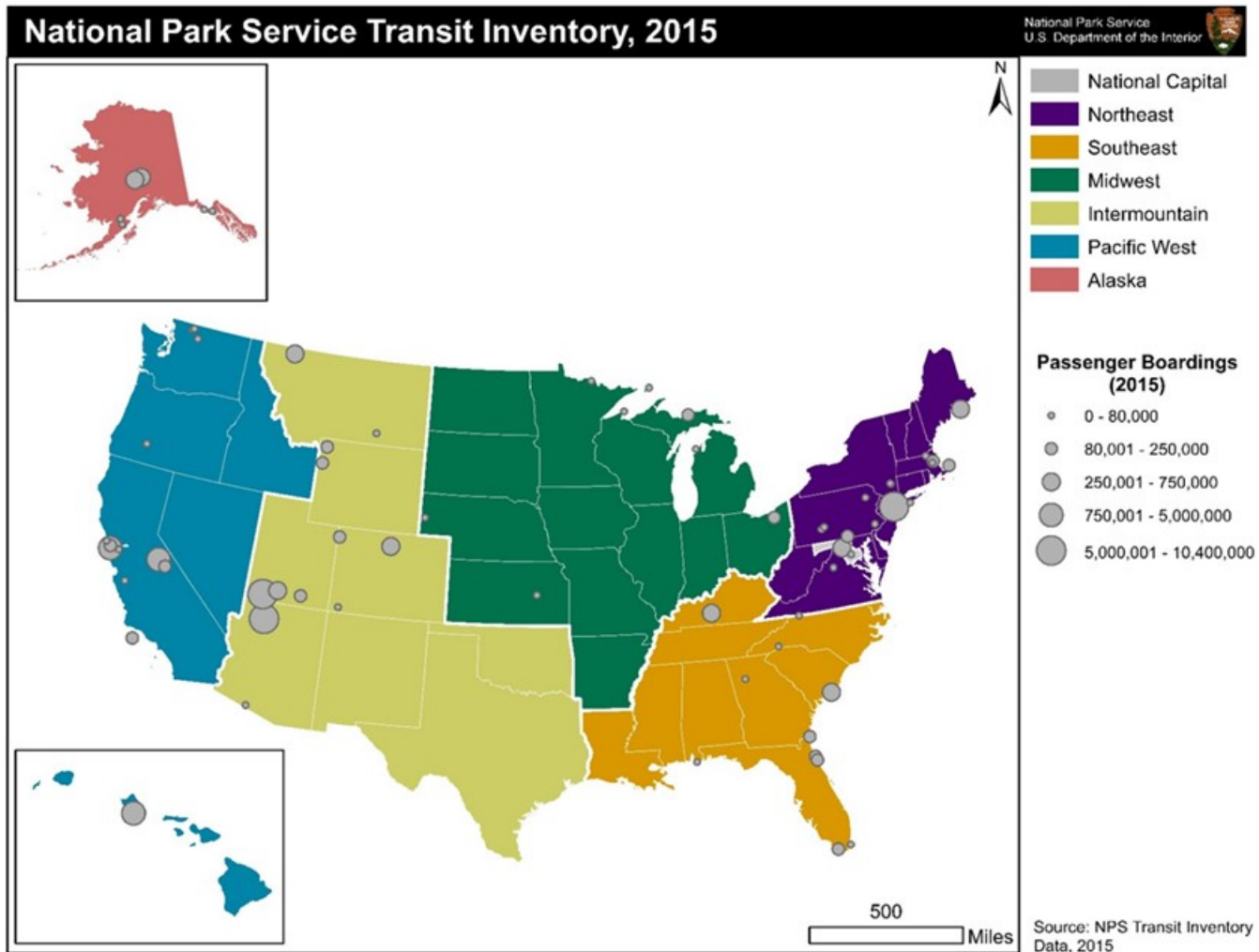


Figure 5: Passenger boardings by NPS region
(N=122 systems)

Source: 2015 NPS National Transit Inventory data

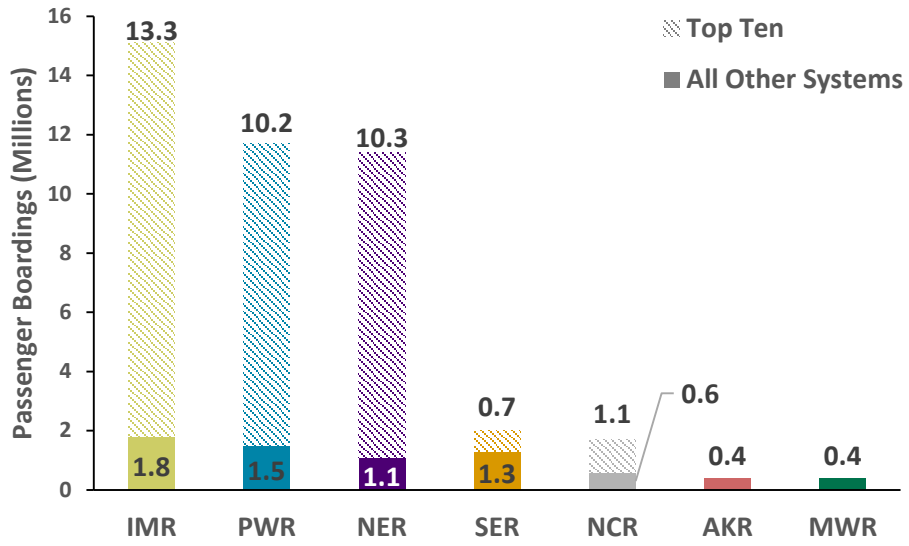
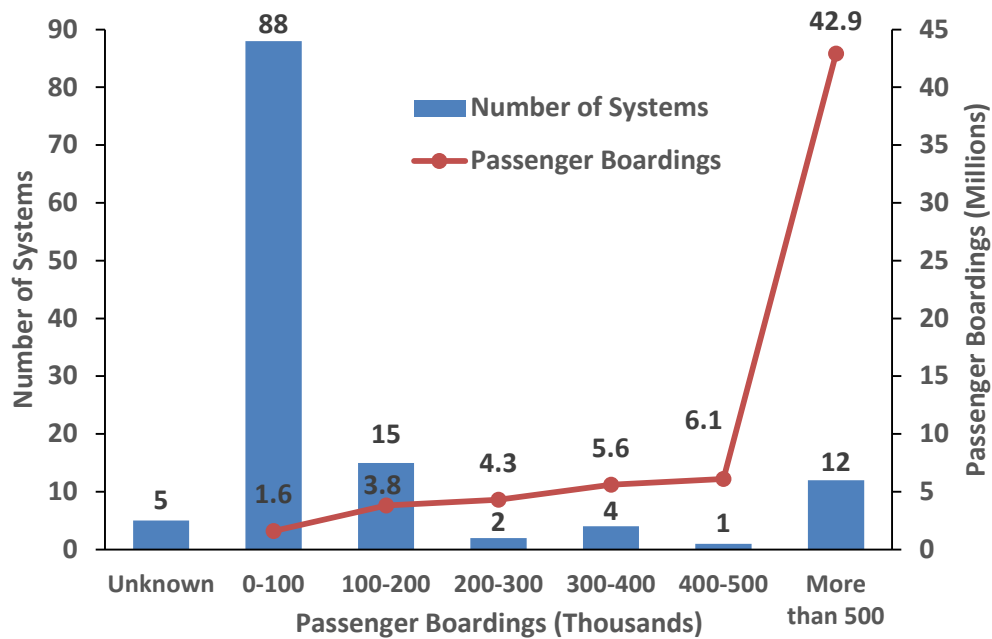


Figure 6 depicts the number of systems and the cumulative total number of passenger boardings at different ranges of passenger boardings. The chart illustrates that while only 12 transit systems have over 500,000 passenger boardings, these systems comprise the largest increase in the cumulative total number of passenger boardings. Furthermore, 88 of the NPS transit systems had fewer than 100,000 passenger boardings, comprising 1.6 million of the total passenger boardings in 2015.

Figure 6: Systems by passenger boardings
(N=127 systems)

Source: 2015 NPS National Transit Inventory data

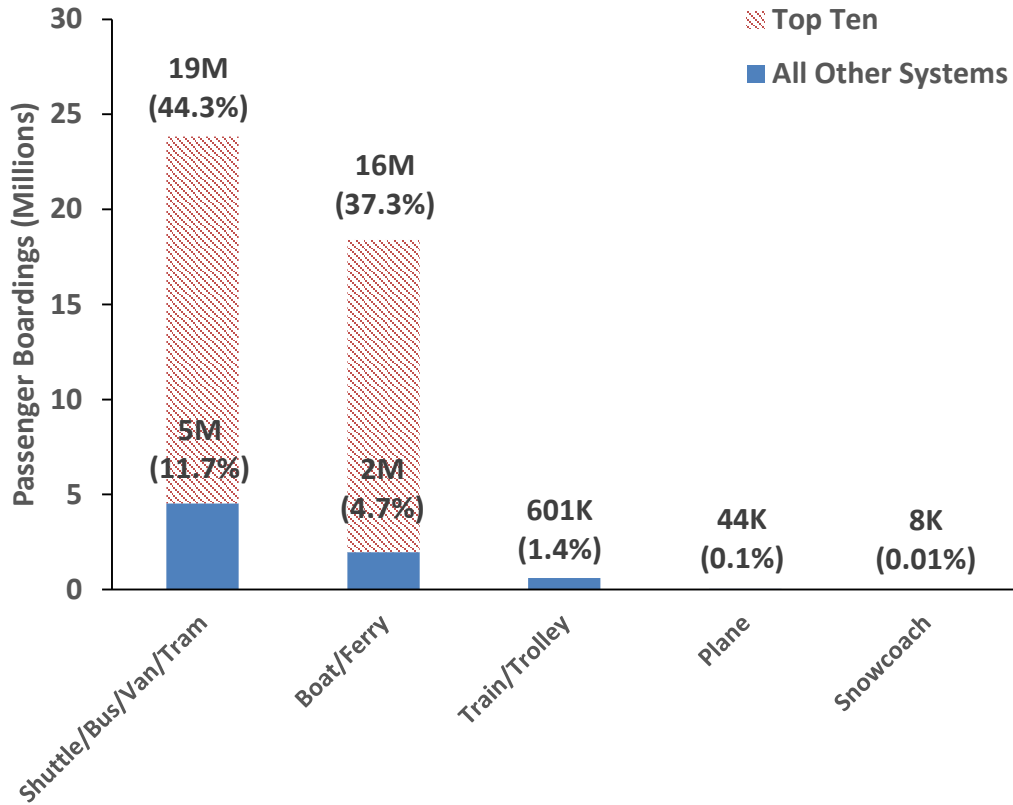


Over half of passenger boardings were on shuttles/buses/vans/trams systems (56 percent) and just under half were on boats/ferries (42 percent). Trains/trolleys, planes, and snowcoaches accounted for only about two percent of all passenger boardings (see Figure 7).

Figure 7: Passenger boardings by mode

(N=122 systems)

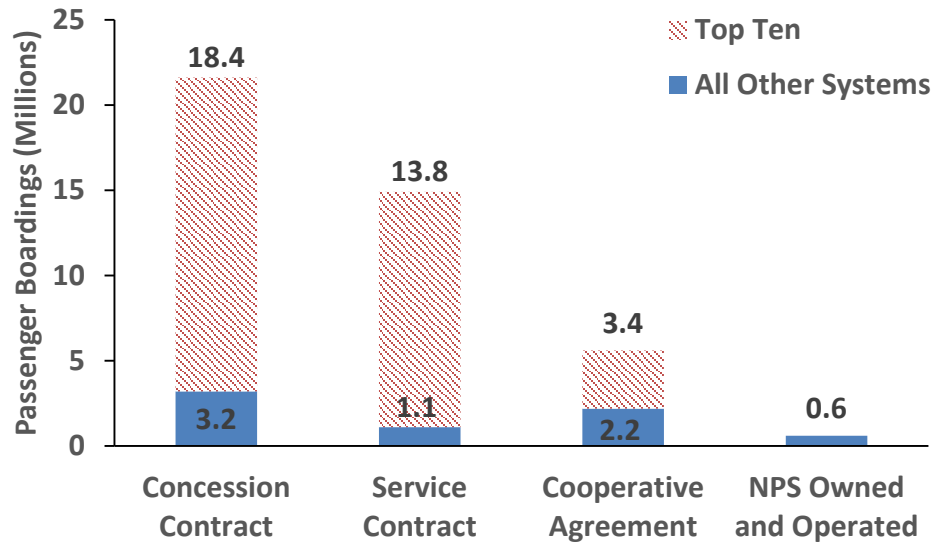
Source: 2015 NPS National Transit Inventory data



Half of passenger boardings (50.4 percent) took place on systems operated under concession contracts. Service contracts carried 34.8 percent of passenger boardings, 13.1 percent under cooperative agreements, and 1.4 percent under NPS owned and operated systems (see Figure 8). Excluding the 10 highest use systems, concession contracts and cooperative agreements accounted for the majority of boardings.

Figure 8: Passenger boardings by business model
(N=122 systems)

Source: 2015 NPS National Transit Inventory data



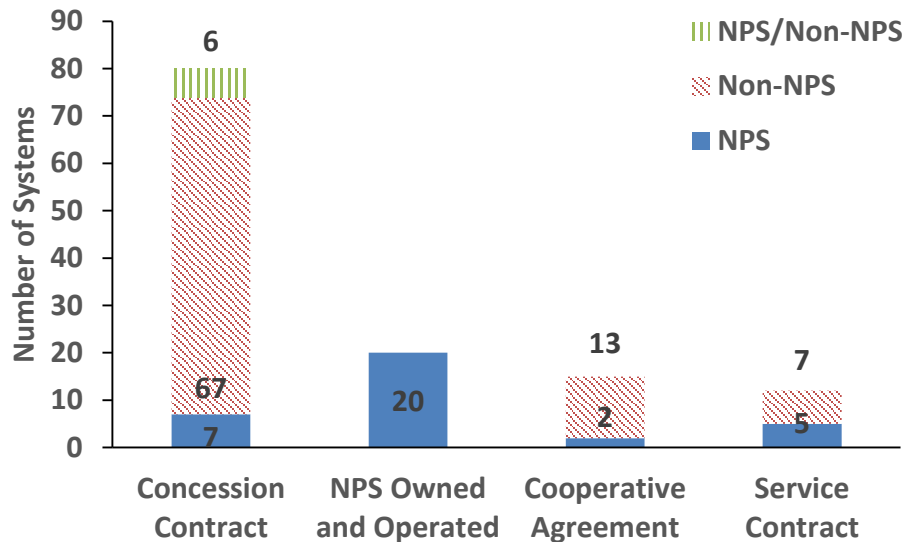
Vehicles

Vehicle Fleets

Over half of the identified transit systems (80 systems, or 63 percent) operate under concession contracts, of which seven systems utilize vehicle fleets owned exclusively by the NPS.¹⁴ These seven fleets are among the 34 total fleets owned by the NPS. The NPS owned and operated 20 of the transit systems (16 percent). These systems tend to be small and provide critical access to a park or park site, are interpretive tours, provide service for special needs visitors, or are a park transportation feature not easily provided by a private operator. Transit systems managed through cooperative agreements account for 15 of the systems (12 percent), of which two of these systems utilize vehicle fleets owned exclusively by the NPS. The remaining 12 transit systems (9 percent) are operated under service contracts, of which five¹⁵ of these systems utilize vehicle fleets owned by the NPS.

Figure 9: Fleet ownership by business model
(N=127 systems)

Source: 2015 NPS National Transit Inventory data



¹⁴ The seven systems operating NPS-owned vehicles under a concession contract are: Glacier Red Bus Tours, North Cascades Rainbow Falls Tours, Yellowstone Historic Yellow Bus Tours, Yosemite Badger Pass Winter Shuttle, Yosemite Mariposa Grove Shuttle, Yosemite Tuolumne Shuttle, and the Yosemite Valley Shuttle.

¹⁵ The five systems operating NPS-owned vehicles under a service contract are: Adams Trolley, Grand Canyon South Rim Shuttle, Harper's Ferry shuttle, Kennesaw Mountain shuttle, and the Zion Canyon shuttle.



The NPS transit fleet is comprised of vehicles operating on both conventional and alternative fuels (the alternative fuel category includes electric and hybrid-electric vehicles, which are shown in Figure 11). The NPS-owned fleet has 275 vehicles, of which 60 percent are classified as alternative fuel vehicles and 40 percent as conventional vehicle fuel. The non-NPS-owned fleet is larger with 747 vehicles, of which 17 percent of the fleet classifies as alternative fuel vehicles and 83 percent classifies as conventional vehicle fuel (see Figure 10 and Figure 11). Most systems operate between 1 and 10 vehicles and most larger systems are not owned by the NPS (see Figure 12).

Figure 10: Fleet: conventional vs. alternative fuel vehicles by ownership
(N=1,022 vehicles)

Source: 2015 NPS National Transit Inventory data

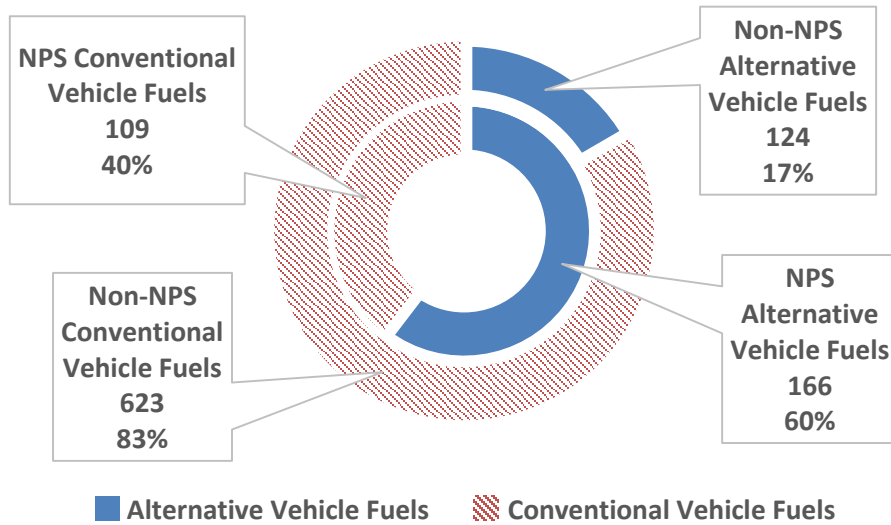


Figure 11: Number of vehicles by fuel type
(N=1,022 vehicles)

Source: 2015 NPS National Transit Inventory data

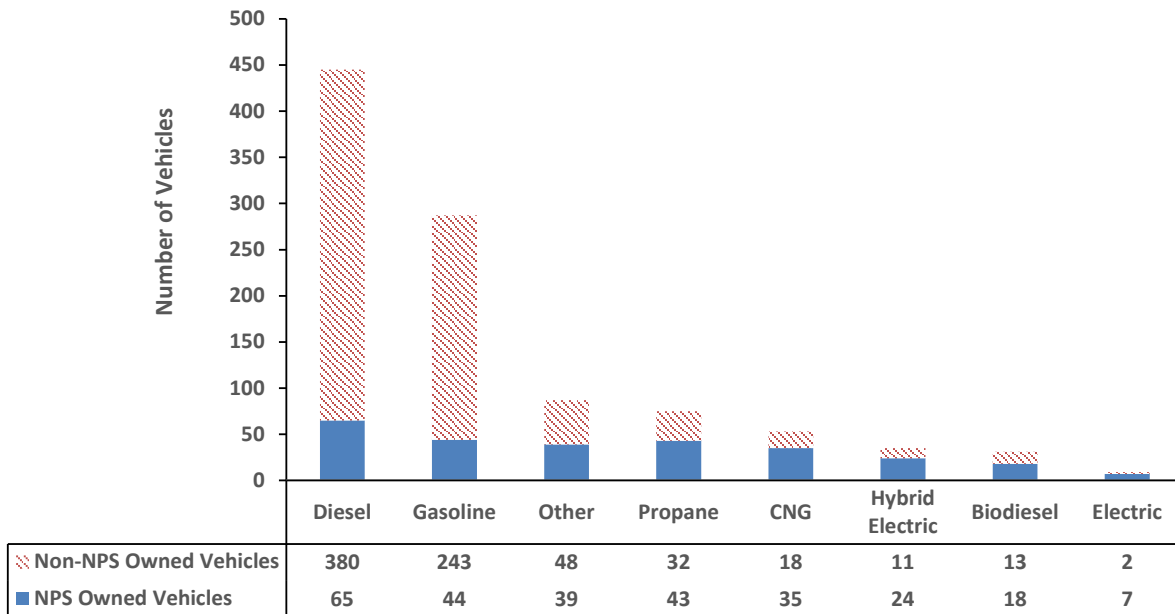
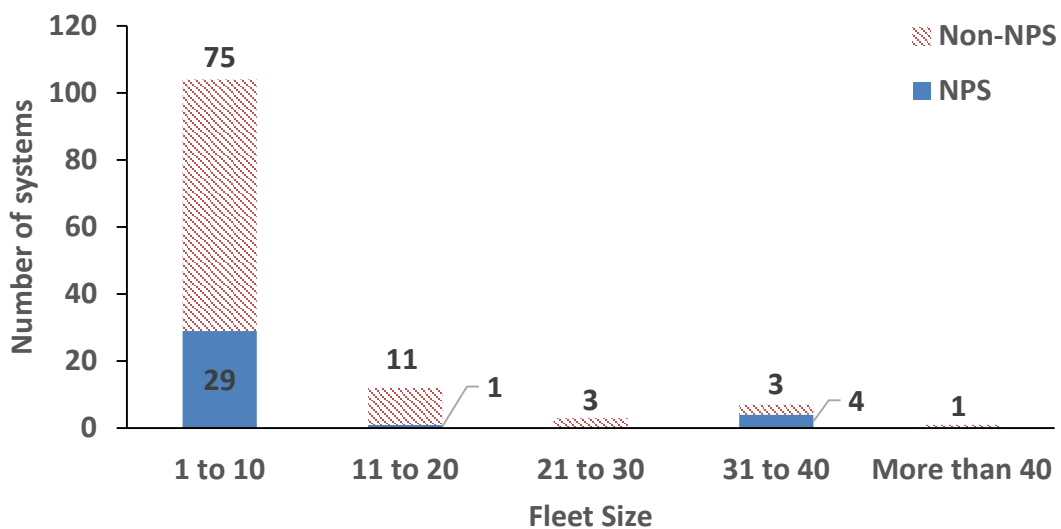


Figure 12: Number of systems by fleet size
(N = 127 systems)

Source: 2015 NPS National Transit Inventory data



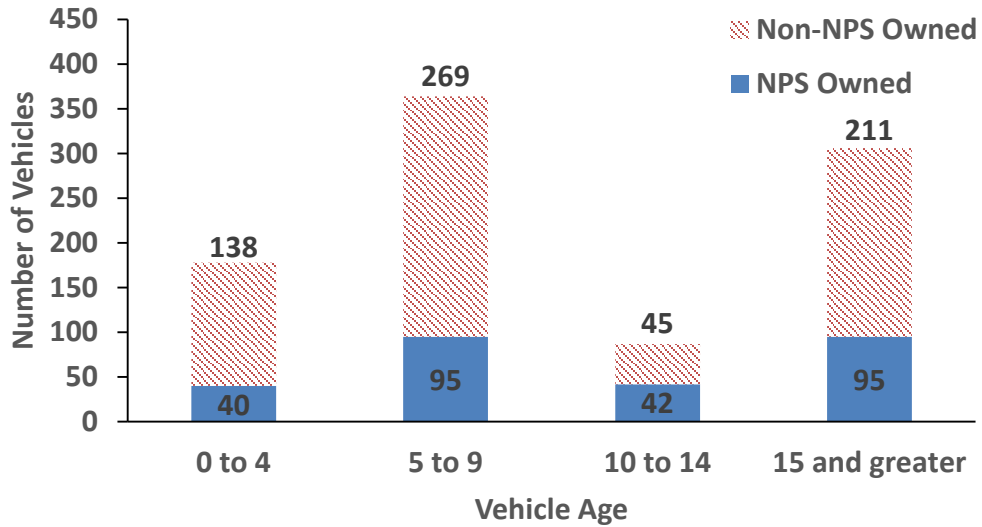
Average Age of Vehicles by Vehicle Type

The majority of vehicles in park transit systems are between 5-9 years old, or 15 years old and greater. A large portion of the vehicles in the 15 years and greater age bracket are owned by non-NPS entities, which could indicate that private sector partners may face significant recapitalization needs in the coming years (see Figure 13). In some cases, this could have implications for a contractor's financial ability to rebid a contract.

Figure 13: All vehicles by age class (years)

(N = 935 vehicles)

Source: 2015 NPS National Transit Inventory data



Performance Measures

A program goal for the NPS Alternative Transportation Program (ATP) is to manage the transportation program based on meaningful, reliable data. The objective is to use measurable, applicable, and achievable performance measures and metrics to guide and support decision-making and management of transit systems in the NPS.

The previous NPS transit inventories (2012-2014) reported performance-oriented findings for CO₂ emissions and fleet recapitalization needs and costs, and the 2015 transit inventory includes these measures and builds upon them.

The performance measures below are split into the following sections which correspond to ATP goals and the Draft NPS National Long Range Transportation Plan: visitor experience; operations; environmental impact; and, asset management. The ATP program goals are included in Appendix C.

Visitor Experience

This performance area addresses how park transportation systems enhance the experience of park visitors. For 2015, the performance measure for visitor experience is accessibility for disabled park visitors (see Figure 14).

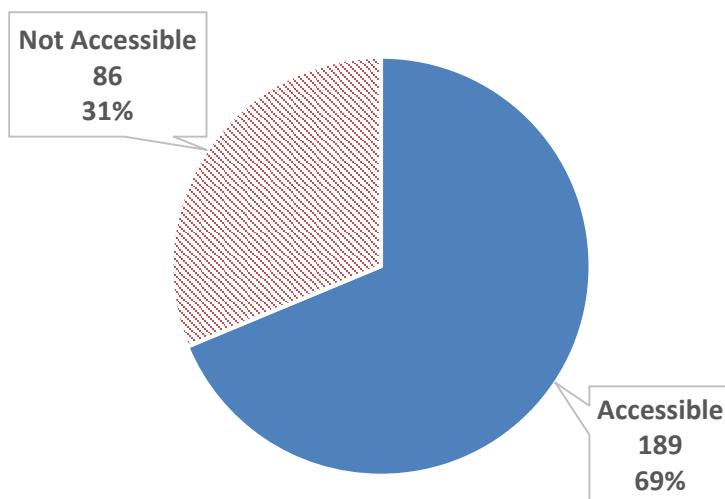
In future years, additional visitor experience measures could evaluate the availability of transit schedule information, the ease of access to the park, and the quality of transit service.

Accessibility for Disabled Visitors

In 2015, a data field was added to determine what percentage of NPS-owned vehicles are accessible for visitors with mobility impairments. The majority (68.7 percent, 189 vehicles) of NPS-owned transit vehicles are accessible for people with mobility impairments (see Figure 14). At the park level, there are 28 parks with NPS-owned vehicles, and five out of the 28 parks with NPS-owned vehicles do not have any vehicles that are accessible.

Figure 14: NPS-owned vehicle accessibility
(N = 275 vehicles)

Source: 2015 NPS National Transit Inventory data



Operations

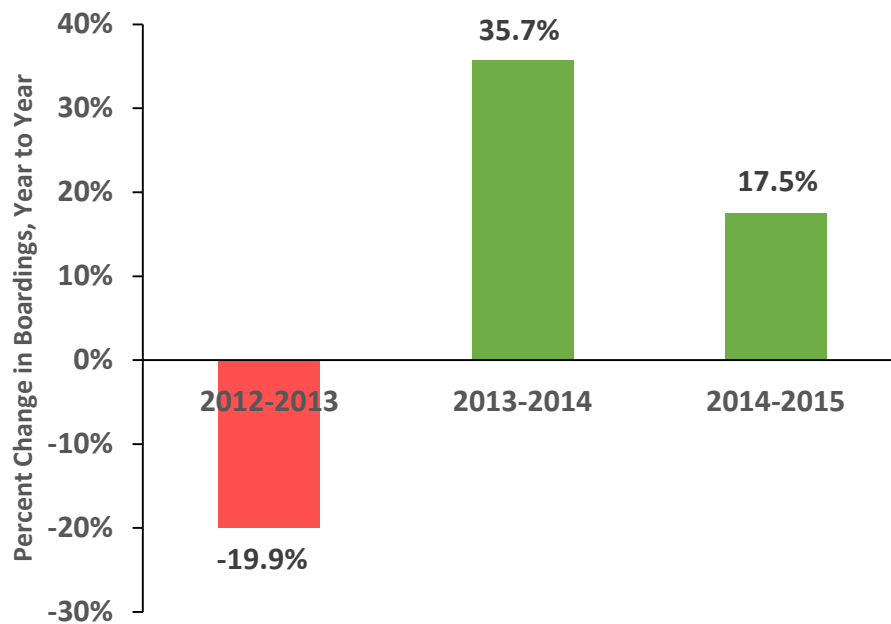
The measure in this area evaluates the operational performance of the NPS transit systems by measuring the percent change in boardings from 2012-2015.

Year-to-Year Trends in Boardings

The graph below shows the percent change in boardings from 2012-2015. From 2012 to 2015, the total boardings across NPS transit systems were 33.2 million, 26.9 million, 36.5 million, and 42.9 million. Boardings decreased in 2013 due to damage from Hurricane Sandy and the government shutdown.¹⁶ Although boardings increased from 2013 to 2015, the percent increase was greatest from 2013 to 2014.

Figure 15: Percent change in boardings from 2012 to 2015

Source: NPS National Transit Inventory data



¹⁶ See the 2013 NPS Inventory Report:
http://ntl.bts.gov/lib/52000/52400/52470/NPS_WASO_2014_National_Transit_Inventory.pdf



Environmental Impact

The 2015 environmental impact measures include estimated annual CO₂ emissions of the bus/shuttle/van/tram systems and the corresponding estimated emissions avoided by visitors using these systems instead of personal automobiles. Additionally, it includes the percentage of NPS transit vehicles that are electric or use alternative fuels.

Annual CO₂ Emissions

It was estimated that 54 shuttle/bus/van/tram systems emitted 12,775 metric tons of CO₂ in 2015. To put this into perspective, the Federal Highway Administration reports that in 2014 the average driver in the U.S. drove 11,048 miles,¹⁷ burning on average 476 gallons of gasoline and emitting 3.8 metric tons of CO₂. It would take 3,345 such drivers to generate the equivalent of the reported shuttle/bus/van/tram system emissions.

Even though the NPS only owns 32 percent of the vehicles, those vehicles travel more miles on average than non-NPS vehicles. NPS-owned vehicles travel 47 percent of the total transit miles, but contribute only 45 percent of the emissions (Table 4).

Table 4: Distribution of miles and CO₂ emissions (metric tons) by vehicle ownership
(N = 54 systems)

Source: 2015 NPS National Transit Inventory data

	Vehicles		Miles Traveled		CO ₂ (Metric Tons)	
	#	%	#	%	#	%
NPS Owned	226	32.0%	3.12M	47.2%	5,725	44.8%
Non-NPS Owned	480	68.0%	3.49M	52.8%	7,050	55.2%

CO₂ Emissions Avoided

The more occupants in a transit vehicle, the more emissions are avoided because of the higher efficiency of the transit vehicle relative to the corresponding number of private automobiles. In the same format as the 2014 Inventory, a range of estimates was used for net CO₂ emissions based on a corresponding range of transit vehicle occupancies.

Table 5 and Figure 16 show these net emissions by vehicle ownership under scenarios for 54 shuttle/bus/van/tram systems where parks provided data on service miles.¹⁸ For very low occupancy levels there are positive values, which indicate that under those scenarios the likely net result of NPS transit would be to contribute to CO₂ emissions, rather than avoid them. If shuttles were at least 40 percent occupied, these systems are estimated to reduce overall emissions. If shuttles were 80 percent filled, they would avoid an estimated net 16,962 metric tons of CO₂ (see Appendix E for methodology).

¹⁷ US Department of Transportation Federal Highway Administration Office of Highway Policy Information, Highway Statistics 2014, Table VM-1. <https://www.fhwa.dot.gov/policyinformation/statistics/2014/pdf/vm1.pdf>

¹⁸ Boat/ferry systems do not replace vehicle trips and therefore are not included in this analysis. There was limited data collection for system types other than shuttle/bus/van/tram. Furthermore, the study team did not estimate emissions mitigated by electric vehicles because it did not collect detailed information about local power generation.



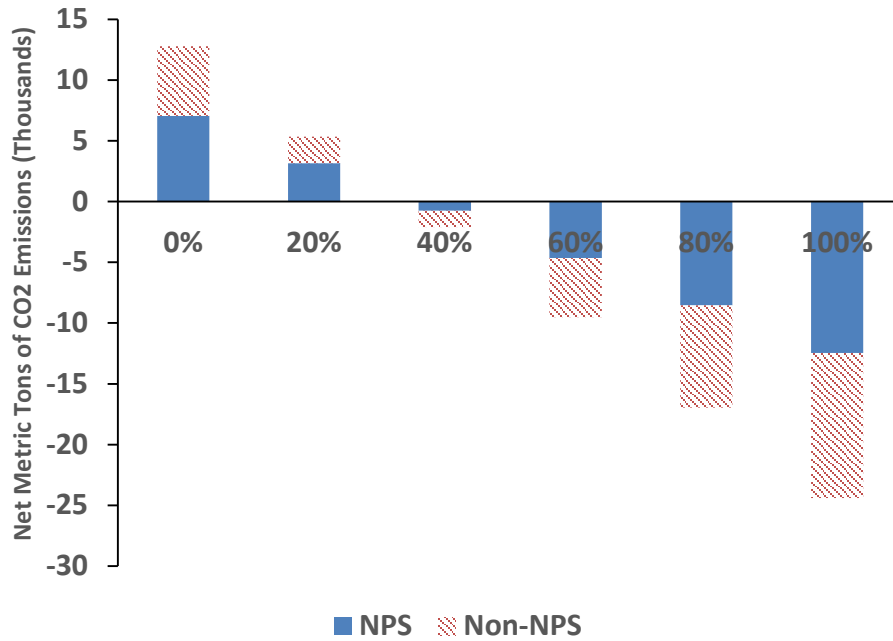
Table 5: Estimated net CO₂ emissions (metric tons) by vehicle ownership
(N = 54 systems)

Source: 2015 NPS National Transit Inventory data

Assumed Transit Vehicle Occupancy	Non-NPS-Owned Systems	NPS-Owned System	Total
0%	7,050	5,725	12,775
20%	3,150	2,191	5,341
40%	-750	-1,344	-2,094
60%	-4,650	-4,878	-9,528
80%	-8,550	-8,412	-16,962
100%	-12,450	-11,946	-24,396

Figure 16: Estimated net CO₂ emissions at various occupancy levels
(N = 54 systems)

Source: 2015 NPS National Transit Inventory data



Alternative Fuel and Electric Vehicles

In 2015, 60 percent of the NPS fleet was electric, hybrid-electric, or used alternative fuels, while 40 percent used conventional fuel. For non-NPS owned vehicles, 17 percent of transit vehicles were classified as using alternative fuels, or as electric/ hybrid-electric (see Figure 10).

Asset Management

Performance measures in this area will help support the long-term financial viability of the NPS transit systems through tracking the age of NPS vehicle fleets, and projected fleet recapitalization costs.

Average Age of NPS Vehicles

Table 6 reports the aggregate average age for NPS-owned transit vehicles service-wide. The average age for some vehicle types may be an indicator of the end of vehicles' service lives.

Table 6: Vehicle age for NPS transit vehicle types

(N=272 vehicles)

Source: 2015 NPS National Transit Inventory data

Vehicle Type	Average Age	Service Life (Years)	Number of Vehicles
6-12 pax Electric Tram	4.8	11	4
Passenger Van	4.7	10	7
Light-Duty Shuttle	8	15	41
Medium-Duty Shuttle	6	15	27
Heavy-Duty Shuttle ¹⁹	8	15	86
Medium-Duty Transit	14.6	18	29
Heavy-Duty Transit	12.8	18	47
Ferry/Boat	20.7	N/A	13
Train/Streetcar	37	N/A	4
Snow Coach	46	N/A	12
School Bus	6	18	2

¹⁹ The GLAC 33 Red Bus Tours vehicles were excluded from this category, as they are approximately 80 years old.



Projected Recapitalization Costs

Using vehicle ages reported by NPS transit systems and standard replacement costs and service life assumptions shown in Appendix E,²⁰ it is estimated that the overdue vehicle recapitalization costs for NPS-owned shuttle/bus/van/tram rolling stock is \$3.9 million (see Table 7). Each park unit is responsible for determining when a vehicle needs to be replaced, which also depends on funding availability. Service life is highly dependent upon utilization, not only vehicle age; therefore, more detailed information is needed.

Table 7: Estimated NPS-owned shuttle/bus/tram/van overdue recapitalization needs, up to 2015
(N = 238 vehicles)

Source: 2015 NPS National Transit Inventory data

Year	Overdue Recapitalization	Number of Vehicles Requiring Replacement (by Type)		Units
		Heavy-Duty Shuttle	Heavy-Duty Transit	
Up to 2015	\$3,870,000	5	7	GRCA, YELL

Assuming each NPS-owned shuttle/bus/tram/van vehicle is recapitalized in-kind at the end of its expected service life, the agency faces an estimated \$38.8 million in rolling stock capital costs between 2016 and 2027. The projected costs are calculated in nominal dollars and vary widely from year to year as vehicles from different systems are due to be replaced. Over the next five years (2016-2020), major recapitalization needs are projected at ADAM and ZION (see Table 8).

²⁰ The service life assumptions used to estimate the recapitalization needs and costs were updated in 2015 to reflect more current cost estimates for the transit vehicles, and to reflect the way NPS transit vehicles are utilized.



Table 8: Estimated NPS-owned shuttle/bus/tram/van rolling stock capital needs, 2016-2027
(N = 238 vehicles)

Source: 2015 NPS National Transit Inventory data

Year	Estimated Capital Replacement Costs	Estimated Number of Vehicles Requiring Replacement (by Type)							Units (Bold and Italics for units requiring > \$1 million) ²¹	
		Passenger Van	Light-Duty Shuttle	Medium-Duty Shuttle	Heavy-Duty Shuttle	Medium-Duty Transit	Heavy-Duty Transit	School Bus		Electric Tram
2016 & 2017	\$568,000	1	5							CACO, PINN, YELL
2018	\$7,425,000					27				ZION
2019	\$1,019,000	2	3		4					GLAC, GRCA, ORPI
2020	\$1,882,000	1	1	1		1	3		1	ADAM , CACO, SHEN, ZION
2021	\$1,865,000	1	13	2	1				1	CUIS, GLAC , HAFE, ZION
2022	\$1,176,000			1	7				2	PINN, YELL
2023	\$18,534,000	2	7	1	26		24			CUIS, GLAC , GRCA , HAFE , JOFL/ALPO, SHEN, YOSE , EUON
2024	\$2,927,000		4	13	4					GLAC, HAFE, NOCA/LACH, ZION
2025	\$842,000		1	5						EUON, MEVE, SCBL, CUIS
2026	\$2,254,000		5	4	6					CACO, GRCA, KEMO, YOSE, CUIS
2027	\$286,000	1						2		YELL, TAPR
Grand Total	\$38,778,000									

²¹ In order to estimate a service-wide transit vehicle replacement cost, replacement years and costs for individual systems are estimated using service-wide assumptions. Year of replacement for individual transit systems is an estimate only and should not be used in place of better information and judgment of park staff making transit system-specific decisions.



Next Steps

The following lessons will be incorporated to improve future transit data calls:

- **Create new and/or refine existing data elements.** The NPS ATP should continue to coordinate with NPS stakeholders to refine the number of fields in the data call and the way in which questions are asked. Potential NPS stakeholders include:
 - Alternative Transportation Systems Lifecycle Asset Management (ATSLAM) Development Group
 - Park Facility Management Division
 - Sustainable Operations and Climate Change (SOCC) Branch
 - Financial and Business Management System Group
 - Commercial Services Program
 - Visitor Use Statistics Office
- **Improve the data collection online tool.** While the website was an improvement from previous years, the online data collection tool needs additional improvements to make it more user-friendly for park staff, and for the analysis of the transit data.
- **Consider tiered data collection, based on system characteristics:** As noted throughout this report, NPS transit systems cover a wide variety of vehicles and service types, some of which operate in similar ways to transit systems in urban areas. These systems with high boardings, that run the service frequently, likely have a larger impact on emissions and recapitalization needs, and the NPS ATP is exploring refinements to data collection for these systems to better understand their impact. Going forward, a tiered data collection based on the number of vehicles and operational characteristics of transit systems in the NPS may help focus data collection and analysis efforts on the systems with the greatest overall impacts.
- **Refine emissions analysis.** The emissions analysis can continue to be refined for units that have the necessary data available. For larger transit systems, additional data collection may enable the NPS ATP to estimate vehicle occupancies, instead of using capacity bucket estimates (see Appendix E). The NPS ATP should consider coordinating with the SOCC Branch to understand ways in which this reporting will be most useful, including looking into effective ways to communicate the emissions savings of NPS transit systems to visitors.
- **Continue to refine service life and replacement costs analysis.** Although the service life and replacement analysis was improved this year with updated assumptions, there are opportunities to incorporate more vehicle and operations data into the analysis. As the NPS ATP considers a tiered data collection, the analysis may be refined based the resulting tiers.
- **Expand performance measures analysis:** The NPS ATP is moving towards quantifying additional performance measures to track progress over time of NPS transit systems, and it may make sense to align a possible tiered data collection approach to the performance measures analysis.
- **Revisit Transit Definition** (see page Appendix B) to reflect new laws and regulations.



Appendix

Appendix A – Acknowledgments

The National Park Service Alternative Transportation Program would like to thank the numerous NPS transit system contacts who graciously provided their time, knowledge, and guidance in the development of this inventory.

Washington Support Office

Nathan Tatum
Alternative Transportation Program

Joni Gallegos
Alternative Transportation Program

Alaska Region

Paul Schrooten
Alaska Region

Melanie Berg
Glacier Bay National Park

Billie Woodcock
Katmai National Park

Jim LeBel
Denali National Park

Intermountain Region

Debra Frye
Intermountain Region

Jack Burns
Zion National Park

Daniel Cloud
Bryce Canyon National Park

Kelly Kager
Glen Canyon National Recreation Area

Pamela Edwards
Grand Canyon National Park

Jean Talbert
Glacier National Park

John Hannon
Rocky Mountain National Park

Allan Loy
Mesa Verde National Park

Dan Johnson
Dinosaur National Monument

Christina Mills
Yellowstone National Park

Donna Sisson
Grand Teton National Park

Stephen Smith
Glacier National Park

Sue Walter
Organ Pipe Cactus National Monument

Ken Woody
Little Bighorn Battlefield National Monument

Midwest Region

Bob Kammel
Midwest Region

Phil Akers
Sleeping Bear Dunes National Lakeshore

Heather Brown
Tallgrass Prairie National Preserve

Coral Conway
Isle Royale National Park

Jennifer McMahan
Cuyahoga Valley National Park

John Patmore
Pictured Rocks National Lakeshore

Chuck Remus
Voyageurs National Park

Chris E. Smith
Apostle Islands National Lakeshore



National Capital Region

Makayah Royal
National Capital Region

Dennis Ebersole
Harpers Ferry National Historical Park

Duane Erwin
Wolf Trap National Park
for the Performing Arts

Dick Swihart
National Mall & Memorial Parks

Northeast Region

Mark Alexander
Northeast Region

Deborah Conway
Steamtown National Historic Site

Christine Bruins
Lowell National Historical Park

John Kelly
Acadia National Park

Graham Delinger
Valley Forge National Historical Park

Ben Hanslin
Statue of Liberty National Monument

John Joyce
Eisenhower National Historic Site

Karst Hoogeboom
Cape Cod National Park

Caroline Keinath
Adams National Historical Park

John Mahoney
Fire Island National Seashore

Christina Marts
Marsh-Billings-Rockefeller National
Historic Park

Keith Newlin
Johnstown Flood National Memorial and
Allegheny Portage Railroad National Historic Site

Giles Parker
Boston Harbor Islands National Recreation Area

Scott Rector
Home of Franklin D. Roosevelt, Eleanor Roosevelt, and
Vanderbilt Mansion National Historic Sites

Tim Taglauer
Shenandoah National Park

Pacific West Region

Dianne Croal
Pacific West Region

Justin DeSantis
Pacific West Region

Travis Poulson
Channel Islands National Park

Jennifer Evans
Crater Lake National Park

Stefanie Martin
Golden Gate National Recreation Area

John Dell'Osso
Point Reyes National Seashore

Paul DePrey
World War II Valor in the Pacific National Monument

Deanna Dulen
Devils Postpile National Monument

Darren Brown
Golden Gate National Recreation Area and
Muir Woods National Monument

Tom Leatherman
Eugene O'Neill National Historic Site

Annelise Lesmeister
North Cascades National Park

Jim Donovan
Yosemite National Park

Sheri Odgen
Yosemite National Park

Mark Rich
Mammoth Cave National Park

Dawn Ryan
Sequoia National Park



Debbie Simmons
Pinnacles National Monument

David Stransky
World War II Valor in the Pacific National Monument

Southeast Region

Kent Cochran
Southeast Region

Lee Edwards
Southeast Region

Julia Treu-Fowler
San Juan National Historic Site

Anthony Paladino
Fort Sumter National Monument

Susan Duke
Buck Island Reef National Monument

William Gordon
Everglades and Dry Tortugas National Parks

Dawn Leonard
Blue Ridge Parkway

Sarah Perschall
Carl Sandburg Home National Historic Site

Andrew Rich
Fort Matanzas and Castillo de San Marcos
National Monuments

Jill Hamilton
Cumberland Island National Seashore

Nancy Walther
Kennesaw Mountain National Battlefield Park

Lindsey Phillips
Gulf Islands National Seashore



Appendix B – Definition of Transit

The NPS Alternative Transportation Program (ATP) developed a definition for an “NPS transit system” prior to conducting the 2012 transit inventory. Only units with systems that met each of these three criteria were considered for the inventory:

1. Moves people by motorized vehicle on a regularly scheduled service;²²
2. Operates under one of the following business models: concessions contract; service contract; partner agreement including memorandum of understanding, memorandum of agreement, or cooperative agreement (commercial use authorizations are not included); or NPS-owned and operated; and²³
3. All routes and services at a given unit that are operated under the same business model by the same operator are considered a single NPS transit system.

This definition was based on a review of past efforts, analysis of the existing transit portfolio, and individual and group conversations with the Regional Transportation Program coordinators and the Federal Lands Highway Program Service-wide Maintenance Advisory Committee (FLHP-SMAC). In response to challenges encountered during the course of the inventory, made small changes to the original draft definition to improve clarity. The definition was uniformly applied to all potential systems to determine whether or not each should be included in the inventory.

The NPS ATP investigated several potential criteria that stemmed from existing ATP documents, Transit in Parks Program (TRIP) documents and applications, and conversations with ATP stakeholders, as presented below.

Provides transit service: An “NPS transit system” should provide transit service. In the glossary of the National Transit Database, the Federal Transit Administration defines transit as synonymous with public transportation and public transportation is defined as follows in the Federal Transit Act, “transportation by a conveyance that provides regular and continuing general or special transportation to the public, but does not include school bus, charter, or intercity bus transportation or intercity passenger rail transportation provided by [Amtrak].” Conversations with NPS regional transportation coordinators further specified transit service should be limited to motorized conveyances. Based on this, the NPS ATP proposed the following criterion: *“moves people by motorized vehicle on a regularly scheduled service.”*

Is important to the NPS mission: The importance of transit systems to fulfilling the NPS mission is a core tenet of the ATP, as established in previous program plans and extensively discussed at program meetings. However, the simple question “Is this system important to the NPS mission?” is subjective and would return inconsistent results. For many systems, particularly those for which the NPS has a financial stake or has a formal contract or agreement in place, the answer seems clear: because the NPS has made an effort to provide the service, the service is assumed to be important to the mission. Other services, particularly those which are operated under commercial use authorization (CUA), are not as clearly essential to the mission. Thus, the NPS ATP proposed the following criterion: *“operates under one of the following business models: concessions contract; service contract; partner agreement including memorandum of understanding, memorandum of agreement, or cooperative agreement (commercial use authorizations are*

²² Services with a posted schedule that have standard operating seasons/days of week/hours. Services which do not operate on a fixed route, are charter services for individual groups, or exist for the sole purpose of providing access to persons with disabilities, are not included.

²³ For the purposes of this inventory, no distinction was drawn between memorandum of understanding, memorandum of agreement, and cooperative agreement. All were recorded as “cooperative agreement.”



not included); or *NPS owned and operated systems*.” The NPS ATP used “cooperative agreement” as a general term, encompassing all qualifying partner agreements (memorandum of understanding, memorandum of agreement, and cooperative agreement).

Concession contracts were included because they require resources and desire by the NPS to initiate. Also, after the bid and award process, concession contracts limit competition with other private operators and thus generally result in close working relationships with the NPS. Commercial use authorizations are not included because prospective CUA operators request permission from NPS to operate. These agreements are not initiated by the NPS and the resulting services are inherently not “NPS” systems.

CUAs were not included because these services are owned and operated by private operators, and the NPS only provides oversight to ensure that the services are operated in accordance with NPS policies and requirements. There are hundreds of CUAs service-wide that provide visitors tours and transportation. Collecting and reporting information on all of these systems could be burdensome to units and regions. If information were to be collected and reported on CUA services at all, an objective measure of importance would need to be identified and two key questions would need to be addressed. First, how does one objectively determine whether a service operated under a CUA is important versus non-essential to the NPS mission? This effort found only one sub-category of CUA that could be considered objective: services that provide sole access to an NPS resource. Second, should NPS represent as its own services for which it has no role in the acquisition, operations, or maintenance activities? Even for CUAs which provide sole access, this effort suggests not. This determination is not to suggest that the service is not important to the NPS, but rather to acknowledge that the service is not the responsibility of NPS – in other words, it is not an “NPS transit system.” These systems could be tracked separately but would not be included in the inventory.

Reduces Vehicle Miles Traveled (VMT): Reduced VMT was a key factor in TRIP applications because, in theory, reducing VMT reduces emissions. However, the simple question of “Does a system reduce VMT?” was tested on candidate NPS transit systems, and answers tended to be complex and debatable. The NPS ATP determined that “reduces VMT” is not an objective criterion. Although reducing VMT can be a goal of NPS transit systems, it should not be a defining characteristic.

Provides critical access: Both TRIP and Category III have traditionally funded systems which provide sole access via alternative transportation. The question “Does a system provide critical access?” was tested on candidate NPS transit systems. However, not all NPS transit systems provide critical access, and not all systems which provide critical access meet other likely criteria of a definition, such as NPS having a financial stake. Thus, this would not contribute toward a simple, clear definition.

Tours versus transportation: The TRIP program made a distinction between interpretive tours and transportation, the former being a recreational activity itself, and the latter being the conveyance of a passenger to or between activities. Whether a system is a tour or provides transportation was tested on candidate NPS transit systems. The distinction was often ambiguous. Many “transportation services” also provide interpretation or offer an experience on board. Many “tours” transport people to activities, allow people to get on and off, and/or take passengers to places in national parks that they could not access in their cars (for example, to a point on a body of water). Furthermore, both tours and transportation services further the visitor experience component of the NPS mission, and the NPS ATP sought not to prioritize one over the other. Although in daily life a transportation trip (often thought to be mandatory, for instance, to the grocery store) might be more important than a tour trip (often thought to be discretionary, for



instance, a historical tour of a battlefield), in a recreational setting such as national park both types of trips may be vital to providing high quality visitor experiences.

Is part of a connected, multimodal network: Several stakeholders suggested this criterion. However, it is vague, and requires further definition of the term “connected, multimodal network.”

Identifying unique systems: In order to be consistent service-wide in counting the number of transit systems, the NPS ATP investigated methods for defining where one transit system stops and another starts and tested these with candidate NPS transit systems, particularly at units thought to have more than one system. Based on this, the NPS ATP proposed a final criterion: *“all routes and services operated by the same operator under the same business model at a given unit are considered a single transit system.”*

Once developed, the pilot definition was shared individually with the Transportation Program Coordinators from each of the seven NPS regions. Feedback from each region was generally supportive. The definition was also presented at the May 2012 Federal Lands Highway Program Service-wide Maintenance Committee. Again, reaction by meeting participants was generally supportive. The Associate Director, Park Planning, Facilities, and Lands, formalized the draft definition in August 2012 in a memo titled: “National Park Service Transit Inventory Definition and Next Steps.



Appendix C – NPS Alternative Transportation Program Goals and Objectives

GOAL: Cultivate improvements in transportation connectivity, convenience, and safety for visitors and workforce.

OUTCOME: Access to, from, and within national park units is convenient, safe, and well-connected via appropriate and integrated transportation solutions.

- Develop transportation options that meet the diverse needs of park visitors and NPS workforce.
- Connect and enhance existing transportation options. (Undecided as to whether this one should remain – as it might inhibit creative solutions that can replace existing that do not function or cost too much money)
- Minimize injuries, fatalities, and crashes associated with all modes of transportation.
- Participate in local, regional, and statewide transportation planning processes to ensure appropriate integration of NPS transportation infrastructure, systems, and services.

GOAL: Provide quality transportation experiences that enhance park visits.

OUTCOME: NPS transportation systems contribute to the positive experience of park visitors.

- Improve visitor access to appropriate destinations.
- Use transportation to educate and inform visitors about park resources and services.
- Reduce disruptions to the visitor experience related to vehicle traffic congestion.
- Design and adapt transportation systems to complement each park's unique context and mission.

GOAL: Demonstrate leadership in environmentally-responsible transportation.

OUTCOME: NPS is recognized as a leader in environmentally-responsible transportation.

- Prioritize investments and operations that reduce vehicle emissions, noise and light pollution, traffic congestion, and unendorsed parking.
- Educate park visitors and workforce about the environmental benefits of transportation options within and beyond park boundaries.
- Contribute to NPS and park unit greenhouse gas emissions reduction goals.
- Implement proven green transportation innovations and best practices where appropriate.

GOAL: Ensure the long-term financial viability of NPS transportation infrastructure, systems, and services.

OUTCOME: Funding is adequate to maintain transportation infrastructure, operate transportation systems, and manage transportation services now and into the foreseeable future

- Consider the full range of business models and associated lifecycle costs (direct and indirect) before making investments.
- Increase the flexibility of funding mechanisms to better support transportation options.
- Right-size and maintain needed transportation assets and services in a state of good repair.



- Develop transportation options with reciprocal benefits for NPS and gateway communities which can be collaboratively funded and/or operated.
- Seek to enhance or develop partnerships with public, private, and philanthropic organizations that are aligned with the NPS mission.

GOAL: Manage the transportation program based on meaningful, reliable data.

OUTCOME: NPS demonstrates accountability in the management of transportation resources.

- Use measurable, applicable, and achievable performance measures and metrics to guide and support decision-making and management of the transportation program.
- Invest in and maintain data that supports performance measures aligned with program goals.
- Continually evaluate transportation options to ensure they meet program goals, and adjust operations to optimize system performance.



Appendix D – 2015 NPS National Inventory System List

Alaska Region (AKR)

Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
DENA	Airplanes owned by Fly Denali	Plane	2,974	Non-NPS	Concession Contract	Interpretive Tour	Jim LeBel
DENA	Airplanes owned by K2	Plane	9,694	Non-NPS	Concession Contract	Mobility to or Within Park	Jim LeBel
DENA	Airplanes owned by Kantishna Air Taxi	Plane	2,343	Non-NPS	Concession Contract	Mobility to or Within Park	Jim LeBel
DENA	Airplanes owned by Sheldon	Plane	1,223	Non-NPS	Concession Contract	Mobility to or Within Park	Jim LeBel
DENA	Airplanes owned by Talkeetna Air Taxi	Plane	13,576	Non-NPS	Concession Contract	Mobility to or Within Park	Jim LeBel
DENA	Bus Tours and Shuttle Service	Shuttle/Bus /Van/Tram	342,896	NPS/Non-NPS	Concession Contract	Critical Access	Jim LeBel
GLBA	Airport shuttle	Shuttle/Bus /Van/Tram	Not reported	Non-NPS	Concession Contract	Mobility to or Within Park	Melanie Berg
GLBA	Day boat tour	Boat/Ferry	Not reported	Non-NPS	Concession Contract	Interpretive Tour	Melanie Berg
KATM	Float plane 1	Plane	69	Non-NPS	Concession Contract	Mobility to or Within Park	Billie Woodcock
KATM	Float plane 2	Plane	77	Non-NPS	Concession Contract	Mobility to or Within Park	Billie Woodcock
KATM	Float plane 3	Plane	80	Non-NPS	Concession Contract	Mobility to or Within Park	Billie Woodcock
KATM	Float plane 4	Plane	86	Non-NPS	Concession Contract	Mobility to or Within Park	Billie Woodcock
KATM	Float plane 5	Plane	87	Non-NPS	Concession Contract	Mobility to or Within Park	Billie Woodcock
KATM	Float plane 6	Plane	32	Non-NPS	Concession Contract	Mobility to or Within Park	Billie Woodcock
KATM	Float plane 7	Plane	28	Non-NPS	Concession Contract	Mobility to or Within Park	Billie Woodcock
KATM	KATM bus tours	Shuttle/Bus /Van/Tram	1,584	Non-NPS	Concession Contract	Mobility to or Within Park	Billie Woodcock



Intermountain Region (IMR)

Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
BRCA	Bryce Canyon Shuttle and Rainbow Point Shuttle	Shuttle/Bus /Van/Tram	487,275	Non-NPS	Service Contract	Mobility to or Within Park	Daniel Cloud
DINO	Tram transit	Shuttle/Bus /Van/Tram	189,374	Non-NPS	Service Contract	Critical Access	Dan Johnson
GLAC	Glacier Park Boat Company -interpretive boat tours	Boat/Ferry	68,459	Non-NPS	Concession Contract	Interpretive Tour	Jean Tabbert
GLAC	Hiker Shuttle	Shuttle/Bus /Van/Tram	3,449	Non-NPS	Concession Contract	Mobility to or Within Park	Jean Tabbert
GLAC	Red Bus Tours	Shuttle/Bus /Van/Tram	43,483	NPS	Concession Contract	Interpretive Tour	Jean Tabbert
GLAC	Sprinter Shuttles & Optima Shuttles	Shuttle/Bus /Van/Tram	145,730	NPS	Cooperative Agreement	Mobility to or Within Park	Stephen N. Smith
GLAC	Sun Tours	Shuttle/Bus /Van/Tram	3,363	Non-NPS	Concession Contract	Interpretive Tour	Jean Tabbert
GLCA	Antelope Point	Boat/Ferry	33,736	Non-NPS	Concession Contract	Interpretive Tour	Kelly Kager
GLCA	Boat tours	Boat/Ferry	118,461	Non-NPS	Concession Contract	Interpretive Tour	Kelly Kager
GLCA	Flatwater tour	Boat/Ferry	53,183	Non-NPS	Concession Contract	Interpretive Tour	Kelly Kager
GLCA	SR276 passenger ferry	Boat/Ferry	7,022	Non-NPS	Service Contract	Transportation Feature	Kelly Kager
GRCA	Grand Canyon Railway	Train/ Trolley	323,114	Non-NPS	Concession Contract	Mobility to or Within Park	Pamela Edwards
GRCA	North Rim Hiker Shuttle	Shuttle/Bus /Van/Tram	718	Non-NPS	Concession Contract	Mobility to or Within Park	Pamela Edwards
GRCA	South Rim Bus Tours	Shuttle/Bus /Van/Tram	94,579	Non-NPS	Concession Contract	Interpretive Tour	Pamela Edwards
GRCA	South Rim Shuttle Service	Shuttle/Bus /Van/Tram	7,419,961	NPS	Service Contract	Mobility to or Within Park	Pamela Edwards
GRTE	Jenny Lake Shuttle Boat	Boat/Ferry	130,978	Non-NPS	Concession Contract	Mobility to or Within Park	Donna Sisson
LIBI	LIBI bus tours	Shuttle/Bus /Van/Tram	9,499	Non-NPS	Concession Contract	Interpretive Tour	Ken Woody
MEVE	Long House Trailhead tram and Half-day ranger guided	Shuttle/Bus /Van/Tram	19,866	Non-NPS	Concession Contract	Mobility to or Within Park	Allan Loy
ORPI	Ajo Mountain Drive tour	Shuttle/Bus /Van/Tram	929	NPS	Concession Contract	Critical Access	Sue Walter



Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
ROMO	Bear Lake & Moraine Park shuttle, Hiker Shuttle to Estes Park	Shuttle/Bus /Van/Tram	577,029	Non-NPS	Service Contract	Critical Access	John Hannon
YELL	Backcountry Adventures (YELL 504)	Shuttle/Bus /Van/Tram	1,238	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Buffalo Bus Touring (YELL 506,509,510) Summer	Shuttle/Bus /Van/Tram	8,997	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Buffalo Bus Touring (YELL 506,509,510) Winter	Shuttle/Bus /Van/Tram	8,197	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Gary Fales Outfitting Inc	Snowcoach	Not reported	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Historic Yellow Bus tours	Shuttle/Bus /Van/Tram	11,785	NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Scenic Safaris (YELL 512,513,514,515,516,517,518)	Shuttle/Bus /Van/Tram	3,900	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	See Yellowstone Alpen Guides (YELL 501,502)	Mixed	12,525	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Xanterra Parks & Resorts interpretive bus tours	Shuttle/Bus /Van/Tram	19,129	NPS/Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Xanterra Parks & Resorts interpretive snowcoaches tours	Shuttle/Bus /Van/Tram	6,638	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	YELL boat	Boat/Ferry	6,384	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	YELL snow coaches	Snowcoach	6,288	NPS/Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Yellowstone Expeditions (YELL 300)	Mixed	2,183	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
ZION	Zion Canyon Shuttle	Shuttle/Bus /Van/Tram	5,297,860	NPS	Service Contract	Critical Access	Jack Burns



Midwest Region (MWR)

Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
APIS	Excursion Boat	Boat/Ferry	38,917	Non-NPS	Concession Contract	Interpretive Tour	Chris E. Smith
CUVA	Cuyahoga Valley Scenic Railroad	Train/Trolley	185,550	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Jennifer McMahon
ISRO	MV Isle Royal Queen IV	Boat/Ferry	10,324	Non-NPS	Concession Contract	Critical Access	Coral Conway
ISRO	MV Ranger III	Boat/Ferry	5,005	NPS	NPS Owned and Operated	Critical Access	Coral Conway
ISRO	MV Sandy tour	Boat/Ferry	3,793	Non-NPS	Concession Contract	Interpretive Tour	Coral Conway
ISRO	MV Voyageur II and Sea Hunter III	Boat/Ferry	8,238	NPS/Non-NPS	Concession Contract	Critical Access	Coral Conway
ISRO	Royale Air Service Inc. float plane	Plane	1,786	Non-NPS	Concession Contract	Critical Access	Coral Conway
PIRO	Pictured Rocks Cruises	Boat/Ferry	146,063	Non-NPS	Concession Contract	Interpretive Tour	John Patmore
SCBL	SCBL free shuttle service	Shuttle/Bus /Van/Tram	2,525	NPS	NPS Owned and Operated	Mobility to or Within Park	Phil Akers
SLBE	Manitou Island Transit	Boat/Ferry	12,195	Non-NPS	Concession Contract	Transportation Feature	Phil Akers
TAPR	TAPR bus tour	Shuttle/Bus /Van/Tram	2,291	NPS	NPS Owned and Operated	Interpretive Tour	Heather Brown
VOYA	VOYA tour boat	Boat/Ferry	2,499	NPS	NPS Owned and Operated	Interpretive Tour	Chuck Remus

National Capital Region (NCR)

Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
HAFE	HAFE shuttle transport	Shuttle/Bus /Van/Tram	367,018	NPS	Service Contract	Critical Access	Dennis Ebersole
NAMA	Big Bus Tours Washington DC	Shuttle/Bus /Van/Tram	1,092,049	Non-NPS	Concession Contract	Interpretive Tour	Dick Swihart
NAMA	DC Circulator	Shuttle/Bus /Van/Tram	264,763	Non-NPS	Cooperative Agreement	Critical Access	Dick Swihart
WOTR	Fairfax Connectors Wolf Trap Express	Shuttle/Bus /Van/Tram	Not reported	Non-NPS	Service Contract	Mobility to or Within Park	Duane Erwin



Northeast Region (NER)

Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
ACAD	Island Explorer & Bicycle Express	Shuttle/Bus /Van/Tram	533,359	Non-NPS	Cooperative Agreement	Mobility to or Within Park	John Kelly
ADAM	Adams trolley	Shuttle/Bus /Van/Tram	62,679	NPS	Service Contract	Critical Access	Caroline Keinath
BOHA	BOHA Ferries	Boat/Ferry	109,661	Non-NPS	Cooperative Agreement	Critical Access	Giles Parker
BOHA	Boston Light Tour	Boat/Ferry	2,292	Non-NPS	Cooperative Agreement	Critical Access	Giles Parker
BOHA	Thompson Island Ferry	Boat/Ferry	30,836	Non-NPS	Cooperative Agreement	Critical Access	Giles Parker
CACO	Coastguard Beach Shuttle	Mixed	99,788	NPS	Concession Contract	Critical Access	Karst Hoogeboom
EISE	EISE shuttle	Shuttle/Bus /Van/Tram	94,922	Non-NPS	Concession Contract	Critical Access	John Joyce
FIIS	Sailors Haven Ferry	Boat/Ferry	Not reported	Non-NPS	Concession Contract	Critical Access	John Mahoney
FIIS	Watch Hill Ferry	Boat/Ferry	36,000	Non-NPS	Concession Contract	Critical Access	John Mahoney
HOFR/E LRO/VA MA	FDR Tram	Shuttle/Bus /Van/Tram	20,089	NPS	NPS Owned and Operated	Special Needs	Scott Rector
HOFR/E LRO/VA MA	Roosevelt Ride	Shuttle/Bus /Van/Tram	24,972	NPS	NPS Owned and Operated	Mobility to or Within Park	Scott Rector
HOFR/E LRO/VA MA	Val-Kill Tram	Shuttle/Bus /Van/Tram	14,923	NPS	NPS Owned and Operated	Special Needs	Scott Rector
JOFL/ALPO	Lakebed Tours	Shuttle/Bus /Van/Tram	1,383	NPS	Cooperative Agreement	Interpretive Tour	Keith Newlin
LOWE	Canal Tours	Boat/Ferry	7,654	NPS	Cooperative Agreement	Interpretive Tour	Christine Bruins
LOWE	LOWE Historic Trolley	Train/ Trolley	63,803	NPS	Cooperative Agreement	Mobility to or Within Park	Christine Bruins
SHEN	Rapidan Camp bus	Shuttle/Bus /Van/Tram	1,679	NPS	NPS Owned and Operated	Interpretive Tour	Tim Taglauer
STEA	Scranton Limited & Live Steam Excursions	Train/ Trolley	28,086	NPS	NPS Owned and Operated	Interpretive Tour	Deborah Conway
STLI/ELIS	Statue of Liberty Ferries	Boat/Ferry	10,343,634	Non-NPS	Concession Contract	Critical Access	Ben Hanslin
VAFO	History of Valley Forge Trolley Tour	Shuttle/Bus /Van/Tram	11,732	Non-NPS	Cooperative Agreement	Interpretive Tour	Graham Delinger



Pacific West Region (PWR)

Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
CHIS	Channel Islands Aviation	Plane	304	Non-NPS	Concession Contract	Critical Access	Travis Poulson
CHIS	Island Packers	Boat/Ferry	136,772	Non-NPS	Concession Contract	Critical Access	Travis Poulson
CRLA	Crater Lake Boat Tour	Boat/Ferry	22,648	Non-NPS	Concession Contract	Interpretive Tour	Sean Denniston
CRLA	Rim Drive Trolley Tour	Shuttle/Bus /Van/Tram	10,353	Non-NPS	Concession Contract	Interpretive Tour	Sean Denniston
DEPO	Reds Meadow Shuttle Bus	Shuttle/Bus /Van/Tram	178,782	Non-NPS	Cooperative Agreement	Critical Access	Deanna Dulen
EUON	NPS Shuttle	Shuttle/Bus /Van/Tram	5,999	NPS	Cooperative Agreement	Critical Access	Tom Leatherman
GOGA/ALCA	Alcatraz Cruises ferry	Boat/Ferry	3,390,850	Non-NPS	Concession Contract	Critical Access	Stefanie Martin
MUWO	Muir Woods Shuttle	Shuttle/Bus /Van/Tram	110,643	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Darren Brown
NOCA/LACH	Rainbow Falls Tours	Shuttle/Bus /Van/Tram	8,356	NPS	Concession Contract	Interpretive Tour	Annelise Lesmeister
NOCA/ROLA	Ross Lake Hiker Shuttle	Boat/Ferry	302	Non-NPS	Concession Contract	Transportation Feature	Annelise Lesmeister
PINN	Pinnacle Shuttle	Shuttle/Bus /Van/Tram	32,853	NPS	NPS Owned and Operated	Mobility to or Within Park	Debbie Simmons
PORE	Headlands Shuttle	Shuttle/Bus /Van/Tram	9,697	Non-NPS	Service Contract	Critical Access	John A. Dell'Osso
SEKI	Gateway Shuttle	Shuttle/Bus /Van/Tram	10,840	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Dawn Ryan
SEKI	Giant Forest Shuttle	Shuttle/Bus /Van/Tram	511,755	Non-NPS	Cooperative Agreement	Critical Access	Dawn Ryan
VALR	Ford Island Tour	Shuttle/Bus /Van/Tram	552,433	Non-NPS	Service Contract	Interpretive Tour	David Stransky
VALR	USS Arizona Memorial Tour	Boat/Ferry	2,673,896	Non-NPS	Cooperative Agreement	Critical Access	David Stransky
YOSE	Badger Pass Winter Shuttle	Shuttle/Bus /Van/Tram	3,504	NPS	Concession Contract	Mobility to or Within Park	Jim Donovan
YOSE	Mariposa Grove Shuttle	Shuttle/Bus /Van/Tram	197,315	NPS	Concession Contract	Mobility to or Within Park	Jim Donovan
YOSE	Tram Tours and Hiker Shuttle	Shuttle/Bus /Van/Tram	86,136	Non-NPS	Concession Contract	Interpretive Tour	Jim Donovan
YOSE	Tuolumne Shuttle	Shuttle/Bus /Van/Tram	33,062	NPS	Concession Contract	Mobility to or Within Park	Jim Donovan



Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
YOSE	YARTS	Shuttle/Bus /Van/Tram	103,523	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Jim Donovan
YOSE	Yosemite Valley Shuttle	Shuttle/Bus /Van/Tram	3,620,623	NPS	Concession Contract	Mobility to or Within Park	Jim Donovan

Southeast Region (SER)

Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
BLRI	Sharp Top Mountain Shuttle	Shuttle/Bus /Van/Tram	5,510	Non-NPS	Concession Contract	Interpretive Tour	Dawn Leonard
BUIS	Big Beards Adventure Tours	Boat/Ferry	16,619	Non-NPS	Concession Contract	Interpretive Tour	Susan Duke
BUIS	Caribbean Sea Adventures	Boat/Ferry	10,951	Non-NPS	Concession Contract	Interpretive Tour	Susan Duke
BUIS	Dragonfly	Boat/Ferry	582	Non-NPS	Concession Contract	Interpretive Tour	Susan Duke
BUIS	Jolly Roger Charters	Boat/Ferry	1,663	Non-NPS	Concession Contract	Interpretive Tour	Susan Duke
BUIS	Llewellyns Charters	Boat/Ferry	993	Non-NPS	Concession Contract	Interpretive Tour	Susan Duke
BUIS	Teroro II, Inc.	Boat/Ferry	2,873	Non-NPS	Concession Contract	Interpretive Tour	Susan Duke
CARL	Electric Shuttle	Shuttle/Bus /Van/Tram	3,433	NPS	NPS Owned and Operated	Special Needs	Sarah Perschall
CUIS	Ferry service	Boat/Ferry	93,396	Non-NPS	Concession Contract	Critical Access	Jill Hamilton-Anderson
CUIS	Land and Legacies Tour	Shuttle/Bus /Van/Tram	3,338	NPS	Concession Contract	Interpretive Tour	Jill Hamilton-Anderson
DRTO	Ferry service	Boat/Ferry	109,992	Non-NPS	Concession Contract	Critical Access	William Gordon
EVER	Gulf Coast and Flamingo Boat Tours	Boat/Ferry	67,917	Non-NPS	Concession Contract	Interpretive Tour	William Gordon
EVER	Key West Seaplane Adventures	Plane	11,738	Non-NPS	Concession Contract	Interpretive Tour	William Gordon
EVER	Shark Valley Tram Tour	Shuttle/Bus /Van/Tram	78,146	Non-NPS	Concession Contract	Interpretive Tour	William Gordon
FOMA/CASA	Ferry service	Boat/Ferry	150,882	NPS	NPS Owned and Operated	Critical Access	Andrew Rich



Park Code	System Name	Vehicle Type	2015 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
FOSU	Ferry service	Boat/Ferry	314,000	Non-NPS	Concession Contract	Critical Access	Anthony Paladino
GUIS	Ship Island Ferry	Boat/Ferry	52,219	NPS/Non-NPS	Concession Contract	Transportation Feature	Lindsey Phillips
KEMO	Shuttle Bus	Shuttle/Bus /Van/Tram	11,493	NPS	Service Contract	Critical Access	Nancy Walther
MACA	Cave Tours Bus Shuttle	Shuttle/Bus /Van/Tram	209,663	NPS/Non-NPS	Concession Contract	Transportation Feature	Mark Rich
MACA	Green River and Houchin Ferries	Boat/Ferry	163,527	NPS	NPS Owned and Operated	Transportation Feature	Steve Kovar
SAJU	San Juan Trolley	Shuttle/Bus /Van/Tram	739,891	NPS	Cooperative Agreement	Mobility to or Within Park	Julia Treu-Fowler



Appendix E – Estimated CO₂ Emissions Methodology

To calculate annual CO₂ emissions avoided, a range of vehicle occupancy scenarios for non-electric shuttle systems was used (0, 20, 40, 60, 80, and 100 percent) where the park provided service miles and vehicle capacity. 54 of 60 systems met these criteria.

Under each of the vehicle occupancy scenarios, the transit vehicle occupancy was divided by the NPS average visitor vehicle occupancy of 2.6 to estimate passenger vehicle trips avoided.

$$\frac{\text{Transit Vehicle Occupancy}}{\text{Average Visitor Vehicle Occupancy}} = \text{Passenger Vehicle Trips Avoided}$$

Passenger vehicle trips avoided were multiplied by the number of service miles for each shuttle system, to estimate avoided passenger mileage.

$$\text{Passenger Vehicle Trips Avoided} \times \text{Service Miles} = \text{Avoided Passenger Mileage}$$

Fuel consumption by transit vehicles were calculated using the following assumptions:

Fuel Economy²⁴

Pre-2014 Vehicle Class	2014 Vehicle Class	MPG
12-pass., full-size van	None	14
15-pass., full-size van	Van	14
28-pass. bus	Light-duty Shuttle	5
Light-duty hybrid-elec. bus	Light-duty Shuttle Hybrid	8
30-pass., 20-40 ft., heavy-duty bus	Medium-duty Shuttle	5
Med. duty hybrid-elec. bus	Medium-duty Shuttle Hybrid	7
40-pass., 30 ft., heavy-duty bus	Heavy-duty Shuttle	4
Heavy-duty hybrid-elec. bus	Heavy-duty Shuttle Hybrid	6
CNG heavy-duty transit bus	Heavy-duty Shuttle CNG	3
54-passenger school bus	54-passenger School Bus	7

CO₂ Emissions by Fuel Type²⁵

Fuel Type	Emissions (grams/gallon)
Propane	5,740
Gasoline (E10)	8,020
Natural Gas	7,905
Diesel	10,150
Biodiesel (B20)	8,120

The following formula was used to calculate transit vehicle fuel consumption:

$$\frac{\text{Transit Vehicle Service Miles}}{\text{Estimated Fuel Economy}} = \text{Transit Vehicle Fuel Consumption}$$

²⁴ Department of the Interior – Bus Lifecycle Cost Modeling. <http://www.volpe.dot.gov/transportation-planning/public-lands/department-interior-bus-and-ferry-lifecycle-cost-modeling>

²⁵ <http://www.eia.gov/oiaf/1605/coefficients.html>



The avoided fuel consumption was calculated using the average on-road fuel economy for passenger vehicles in the U.S. (23.2 miles per gallon).²⁶

$$\frac{\textit{Avoided Passenger Mileage}}{\textit{Estimated Fuel Economy}} = \textit{Avoided Fuel Consumption from Private Vehicles}$$

The fuel consumption figures were then multiplied by the CO₂ emissions coefficients provided by the U.S. Energy Information Administration and subtracted transit emissions from avoided private emissions to arrive at an estimate for net CO₂ emissions avoided.

$$\textit{Transit Vehicle Fuel Consumption} \times \textit{Emissions Coefficient} = \textit{Estimated Transit Emissions}$$

$$\begin{aligned} \textit{Avoided Fuel Consumption from Private Vehicles} \times \textit{Emissions Coefficient} \\ = \textit{Gross Emissions Avoided} \end{aligned}$$

$$\textit{Gross Emissions Avoided} - \textit{Estimated Transit Emissions} = \textit{Estimated Net Emissions Avoided}$$

²⁶ United States Department of Transportation Bureau of Transportation Statistics, Average Fuel Efficiency of U.S. Light Duty Vehicles (Light duty vehicle, short wheel base), 2014.
http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_04_23.htm



Appendix F – Vehicle Replacement Assumptions

Uniform vehicle replacement costs and expected service lives were used to provide service-wide consistency in estimates of vehicle age, remaining service life, and recapitalization costs. For 2015, the assumptions were updated from previous inventories²⁷ to reflect the usage and operating characteristics of NPS vehicles. NPS vehicles are not utilized in the same way that city transit vehicles are; they are typically not used for the entire year, nor are they used as intensively as transit vehicles in an urban environment. Vehicle cost estimates were mostly taken from the General Service Administration’s AutoChoice Database.

Assumptions	Gas/Diesel/Biodiesel/Propane		CNG	
	Replacement Cost	Expected Life	Replacement Cost	Expected Life
Passenger Van	\$33,000	10	N/A	N/A
Light-duty Shuttle	\$107,000	15	\$120,500	10
Medium-Duty Shuttle	\$147,000	15	\$154,000	10
Heavy-Duty Shuttle	\$147,000	15	\$158,000	10
Medium-Duty Transit	\$275,000	18	\$330,000	20
Heavy-Duty Transit	\$440,000	18	\$478,000	20
School Bus	\$126,500	18	N/A	N/A
6-12 pax Electric Tram	N/A	11	N/A	11

²⁷ The 2014 Inventory used Replacement costs and expected life assumptions based on the Federal Transit Administration: Useful Life of Transit Buses and Vans – April 2007 (http://www.fta.dot.gov/documents/Useful_Life_of_Buses_Final_Report_4-26-07_rv1.pdf).



Assumptions	CNG		Electric-Hybrid		Electric	
	Replacement Cost	Expected Life	Replacement Cost	Expected Life	Replacement Cost	Expected Life
Passenger Van	N/A	10	N/A	10	\$100,000	10
Light-duty Shuttle	\$120,500	15	\$136,000	15	\$395,000	15
Medium-Duty Shuttle	\$154,000	15	\$330,000	15	N/A	15
Heavy-Duty Shuttle	\$158,000	15	\$352,000	15	N/A	15
Medium-Duty Transit	\$330,000	18	\$495,000	18	\$500,000	18
Heavy-Duty Transit	\$478,000	18	\$605,000	18	\$605,000	18
School Bus	N/A	18	N/A	18	N/A	18
6-12 pax Electric Tram	N/A	11	\$20,000	11	N/A	11



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As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.