



NPS National Transit Inventory and Performance Report, 2014



Clockwise from top left: Red Bus Tours (Glacier National Park); Rapidan Camp Bus (Shenandoah National Park); Cuyahoga Valley Scenic Railroad (Cuyahoga Valley National Park); DEPO Shuttle (Devil's Postpile National Monument)

Agreement No.P12PG70503
September 2015

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Acronyms

The following acronyms are used in this report:

ATP	Alternative Transportation Program
FLTP	Federal Lands Transportation Program
FLREA	Federal Lands Recreation Enhancement Act
MAP-21	Moving Ahead for Progress in the 21 st Century
NPS	National Park Service
TRIP	Paul S. Sarbanes Transit in Parks Program

Key Findings in 2014

- **Providing visitor transit service remained a priority for many parks.** 121 transit systems operated in 63 of the 408 NPS units in 2014. Between 2013 and 2014, ten systems were discontinued or consolidated due to contracting adjustments (6 systems), budget cuts (1 system), inclement weather (1 system), and construction (1 system), resulting in a total loss of transit service at 3 units. Some of these services will restart in future years. No new systems were added, but the utilization of the systems in operation grew. (Page 5)
- **Total NPS passenger boardings are on par with mid-sized U.S. cities.** NPS transit systems accommodated 36.5 million passenger boardings in 2014, similar to cities such as Cleveland, OH and Austin, TX. 30.9 million (84.6%) boardings were associated with the top 10 highest-use systems. (Page 11)
- **NPS leverages the private sector to provide the majority of transit service.** 103 (85%) 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 servicewide. The remaining 18 (15%) of transit systems are owned and operated by NPS and account for 1% of boardings. (Page 16)
- **NPS continues strong partnerships with local transit agencies.** 12 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. (Page 8)
- **Most NPS-owned transit vehicles are represented in the NPS's Financial and Business Management System (FBMS).** The project team coordinated with FBMS staff to identify 209 of the 274 NPS-owned transit vehicles in the database. The project team will work with FBMS staff to add missing transit vehicles. (Page 2)
- **NPS has a significantly higher percentage of alternative fuel vehicles than its contract and concession operators.** 59% of NPS-owned vehicles operate on alternative fuel, while 13% of non-NPS-owned vehicles operate on alternative fuel. (Page 18)
- **NPS transit systems may mitigate vehicle emissions, but the data is incomplete.** Using vehicle data for 45 NPS-owned and operated systems, if NPS transit vehicles are on average at least 40% occupied, then NPS transit systems mitigate, rather than contribute emissions. An attempt was made to collect vehicle occupancy; however, due to incomplete data, such data was not used in this analysis. (Page 20)
- **NPS-owned transit vehicles have relatively high recapitalization needs, particularly large NPS-owned fleets.** NPS-owned shuttle / bus / van / tram vehicles have an estimated \$1.4 million in overdue recapitalization costs and \$30.4 million in recapitalization needs between 2015 and 2026. 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. (Page 24)

Introduction

This third annual National NPS Transit Inventory and Performance Report communicates the service-wide outcomes, benefits, and status of NPS transit to stakeholders, partner agencies, Congress, and the American public. The 2012 inventory¹ was the first comprehensive listing of these systems since 1998, covering surface, waterborne, and air systems. The 2012 inventory established the first accepted definition of NPS transit systems and provided a framework for future data collection; helped NPS comply with Public Law 112-141, Moving Ahead for Progress in the 21st Century (MAP-21), which required the NPS to conduct a facilities inventory; and fulfilled other internal needs. The 2013 inventory built on these successes, but went further by assembling more detailed vehicle and performance information.

The 2014 is meant to help NPS:

- Implement and track progress of the Green Parks Plan, the National Long-Range Transportation Plan, Regional Long-Range Transportation Plans, A Call to Action, and the Capital Investment Strategy,
- Integrate transit data with NPS systems of record, including asset management data in the Facility and Business Management System (FBMS) for NPS-owned vehicles,
- Advance transit performance measurement,
- Comply with Executive Order 13514, which requires federal agencies to measure, manage, and reduce greenhouse gas emissions,
- Communicate program information and projected capital needs internally and externally for future transportation reauthorizations,
- Identify and pursue novel transit funding sources from federal aid programs and partners.

This 2014 inventory includes an update to all of the data elements collected from the previous year, with a few changes, including more detailed transit vehicle asset data. This report provides asset management and operational information not captured by current NPS systems of record and is complementary to more detailed inventories developed by NPS regions. The effort does not replace these regional initiatives and is neither designed nor intended to influence investment or operations decisions associated with individual transit systems. Individual NPS units, in partnership with NPS regions, determine if they need transit systems and how such systems are operated.

Data Collection and Methodology

In preparation for the 2012 National NPS Transit Inventory, the NPS Washington Support Office's Alternative Transportation Program (ATP), in partnership with the transportation coordinators from each of the seven NPS regional offices, developed an objective definition of NPS transit systems to ensure consistent data collection across the nation and over time. Only units with systems that met all of the following three criteria were included in this effort (see Appendix B for more information):

1. Moves people by motorized vehicle on a regularly scheduled service;²
2. Operates under one of the following business models: concessions contract; service contract; partner agreement including memorandum of understanding, memorandum of agreement,

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

² 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.

- or cooperative agreement (commercial use authorizations are not included); or NPS-owned and operated; and³
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.

While there are additional transit systems that are critical to transporting visitors to and within NPS units, the ATP chose to limit the inventory to systems which NPS either has a direct financial stake or has committed resources to develop a formal contract or agreement.

A guiding principle of the effort was that reporting should be only minimally burdensome to unit and regional staff. As such, the inventory sought a modest set of easily reportable information available across all NPS units and system types:

- Transit system name and description;
- Passenger boardings;
- Business model;
- System purpose;
- System type/mode;
- Vehicle information including fuel type, capacity, service miles, 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) (new addition in 2014);
- Owner and operator type (NPS or non-NPS) and contact information; and
- Whether a local transit agency participates in the service.

The NPS ATP requested data for the 2014 calendar year (January through December) because most systems tend to collect information such as passenger boardings on that cycle. Like the previous inventories, this 2014 inventory focused on a limited dataset and relatively modest goals, helping establish a data collection framework that depends on unit-level information. In 2013 the team attempted to collect financial information, but those fields were removed this year due to inconsistent reporting.

The project team worked with the NPS Financial and Business Management System (FBMS) staff to better understand how the two can be integrated in the future. The team determined that by adding in the mandatory FBMS fields, any transit vehicles not already in FBMS could be captured with the NPS Transit Inventory data call. Looking to the future, the FBMS and the project team will continue to work together to refine the transit inventory database and coordinate data collection efforts to avoid duplicate data calls for the park staff.

The project team identified 202 transit vehicles in FBMS based on the 2013 Transit Inventory vehicle data and following the 2014 data collection cycle will be providing the NPS FBMS staff information about 13 vehicles. Currently, FBMS does not track ferries/boats, but the project team is coordinating with an FBMS working group proposing the addition of water-based vehicles owned by NPS.

Using the 2013 National NPS Inventory as a starting point, the NPS ATP asked regional transportation coordinators to review the list of systems; identify new, closed, or consolidated systems; and update unit contact information. Contact information changed for 34 systems. From there, the data collection team reached out to contacts at 66 units. All units responded except for

³ 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."

eight⁴. Appendix C includes a full list of surveyed transit systems by system purpose. Through these communications, the data collection team identified no new systems, four closed systems, and six consolidated systems. Some closed systems may reopen in future years. Some parks reported incomplete information because they do not track certain service information requested or could not provide the information before the end of the data call.

The data collection team used an online form to collect data from the units. The data collection team also gave unit contacts the option of providing the information over the phone or via email. Many units chose to fill out the online form, but some elected to answer over the phone or send the information via email. This data collection methodology greatly differs from the spreadsheet used in 2012 and the Microsoft Access Database used in 2013. While the 2014 collection methodology was greatly improved in terms of more efficient collection, processing, and data pre-population, there were some website issues with using the online tool; resolving these will make the data collection effort even easier in the future.

⁴ The systems that did not respond are: HAFE shuttle transport, MACA Cave Tours Bus Shuttle, and YELL's Buffalo Bus Touring, Backcountry Adventures, Yellowstone Winter Tours, Teton Science Schools Inc, and Yellowstone Year-Round Safaris.

Results

Detailed findings of the 2014 inventory are presented in the following sections:

- Summary of Year-on-Year Changes
- System Purpose
- System Characteristics and Locations
- Business Models
- Passenger Boardings
- Vehicle Fleets and Fuel Types
- Performance-Oriented Findings

Summary of Year-on-Year Changes

Table 1 summarizes the differences in key findings between the 2013 and 2014 NPS National Transit Inventory results for data that the ATP collected both years.

Table 1: Changes to NPS transit systems documented between 2013 and 2014 inventories

Source: 2013 and 2014 NPS National Transit Inventory data

Key Findings	2013	2014
Number of Systems	131	121
Number of Parks Represented	66	63
Passenger Boardings	26.9 Million	36.5 Million
Passenger Boardings (Excluding 10 highest ridership systems)	5.9 Million	5.6 Million
Number of Vehicles	927	982
- NPS-Owned	278	274
- Non-NPS	651	708
Systems operated by Local Transit Agency	12	12
Systems that provide critical access	44	41 ⁵

Ten systems were discontinued or consolidated between 2013 and 2014. BISC, MACA, and MABI each discontinued 1 system and YELL consolidated five systems. TAPR was unable to run its system due to heavy flooding on its route. BOHA Light Tours did not run in 2014 due to construction.

⁵ BOHA Lighthouse Tour, BISC National Underwater Park Tours, and MACA Green River Houchin Ferries were each categorized as critical access in CY13 but did not run in CY14.

BISC, MABI, and TAPR discontinued the only systems at those units; therefore, the total number of units with systems declined by three. Some of these systems may restart in future years.

There was approximately a 27 percent increase in passenger boardings between 2013 and 2014; however, this follows an approximately 19 percent drop between 2012 and 2013. This decline in passenger boardings was due to several factors: the 16-day federal government shutdown in October 2013, the temporary closure of Statue of Liberty and Ellis Island due to Hurricane Sandy, and the discontinuation and consolidation of 16 systems. It is important to note that more accurate passenger boarding data may have contributed to the increase as well, while major reporting discrepancies, such as with STLI/ELIS, were accounted for. Greater effort was put into capturing accurate passenger boardings this year during data collection through increased communication with parks.

This year, eight systems did not provide updated data. Those systems are excluded from any performance-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.

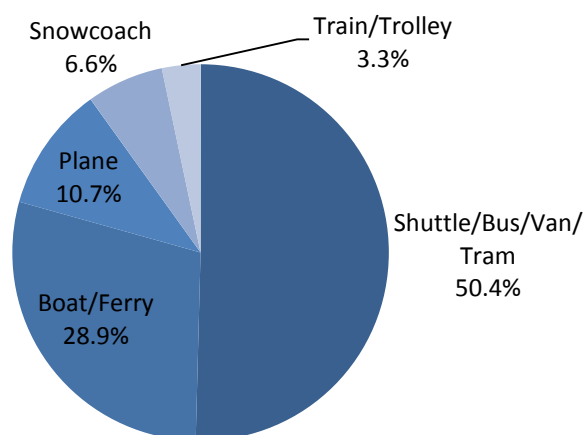
There was no significant change in the number of reported NPS and non-NPS vehicles. In 2014, the data collection team asked for several additional fields of vehicle-specific information to integrate into the NPS Financial and Business Management System (FBMS). The additional information not only assisted in creating more coordinated data collection in the future, but will allow the project team to calculate more accurate vehicle lifecycle costs.

System Purpose

The 2014 inventory identified 121 discrete transit systems spanning 63 of the 408 units of the NPS. NPS transit systems are diverse. Shuttle / bus / van / tram systems make up the largest share of all system types (50.4%), followed by boat / ferry systems (28.9%), planes (10.7%), snowcoaches (6.6%), and trains/trolleys (3.3%) (see Figure 1).

Figure 1: Systems by mode (N=121 systems)

Source: 2014 NPS National Transit Inventory data

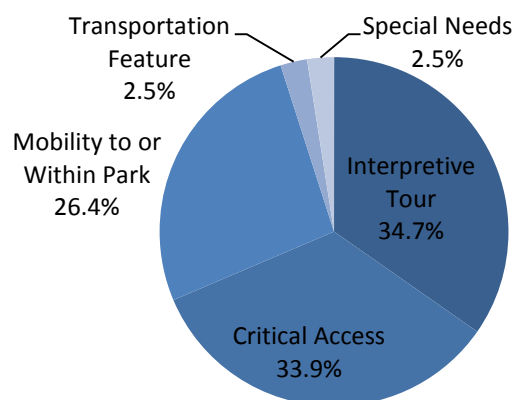


Unit staff identified the primary purpose of each system, as described below and as depicted in Figure 2:

- 42 systems (34.7%) are part of guided **interpretive tours**;
- 41 systems (33.9%) 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;
- 32 systems provide **mobility to or within a park** as a supplement to private automobile access;
- 3 systems are **transportation features** that are a primary attraction of the park unit; and
- 3 systems meet the accessibility needs of visitors with **special needs**.

Figure 2: Systems by primary purpose (N=121 systems)

Source: 2014 NPS National Transit Inventory data



System Characteristics and Locations

As introduced in Table 1 and discussed further below, 121 NPS transit systems operated in 2014. Figure 3 and Figure 4 place these systems in the context of primary system purpose, boardings, geographical location, and business model. Results for system characteristics and locations in 2014 are similar to the results reported previously in 2013. Figure 3 shows that the majority of boardings are on high-ridership shuttle and water-based systems operated through service contracts (13 systems) and concession contracts (80 systems). High-ridership systems are located primarily in the NPS Intermountain, Northeast, and Pacific West Regions. Figure 3 also shows that these services either supplement private automobile access to or within park units, or provide critical access to units/sites not readily accessible by automobile.

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. Approximately 10 million of the 16.8 million passenger boardings recorded for water-based concession systems were associated with ferries for Alcatraz Island and the Statue of Liberty.

The number of cooperative agreements with local transit agencies (12 systems) did not change between 2013 and 2014. Those partnerships accounted for 5.8 million passenger boardings in 2014. Passenger boardings among NPS owned and operated systems (18 systems) accounted for approximately 500,000 passenger boardings. Most of these systems either provide critical access to a unit/site or an interpretive experience for visitors. The inventory also identified several smaller systems, including 14 plane and 11 snowcoach concession systems and four train/trolley systems operated either by NPS, a concessioner, or under a service contract.

Figure 3: Systems by primary system purpose and business model (N=114 systems)

Source: 2014 NPS National Transit Inventory data

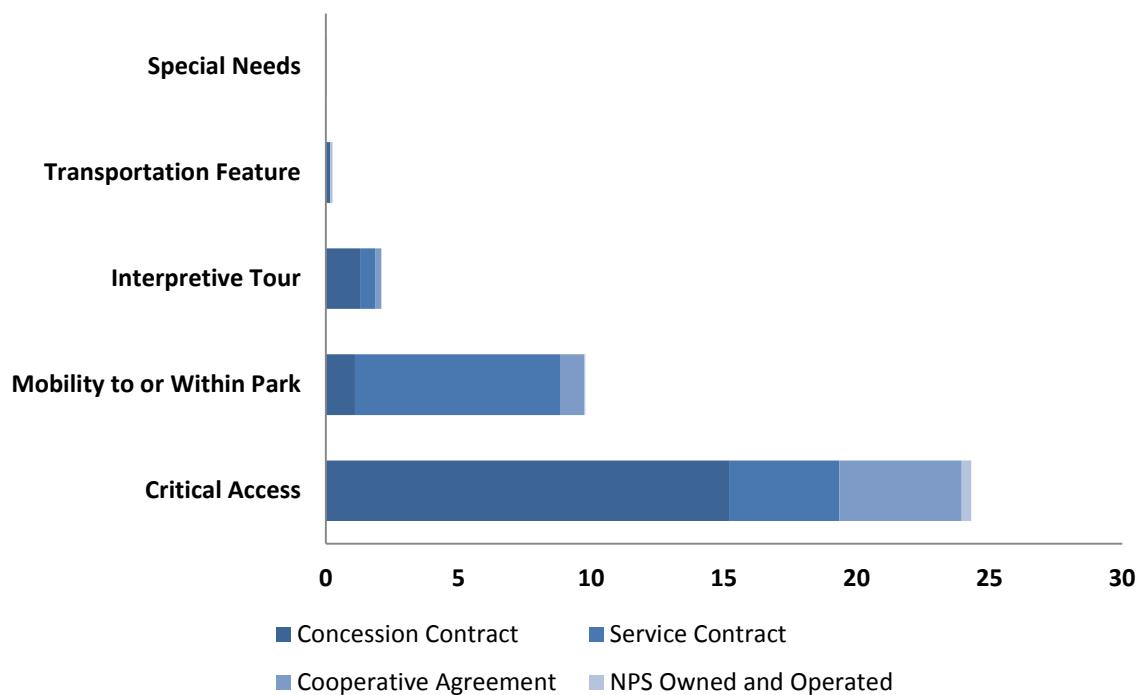
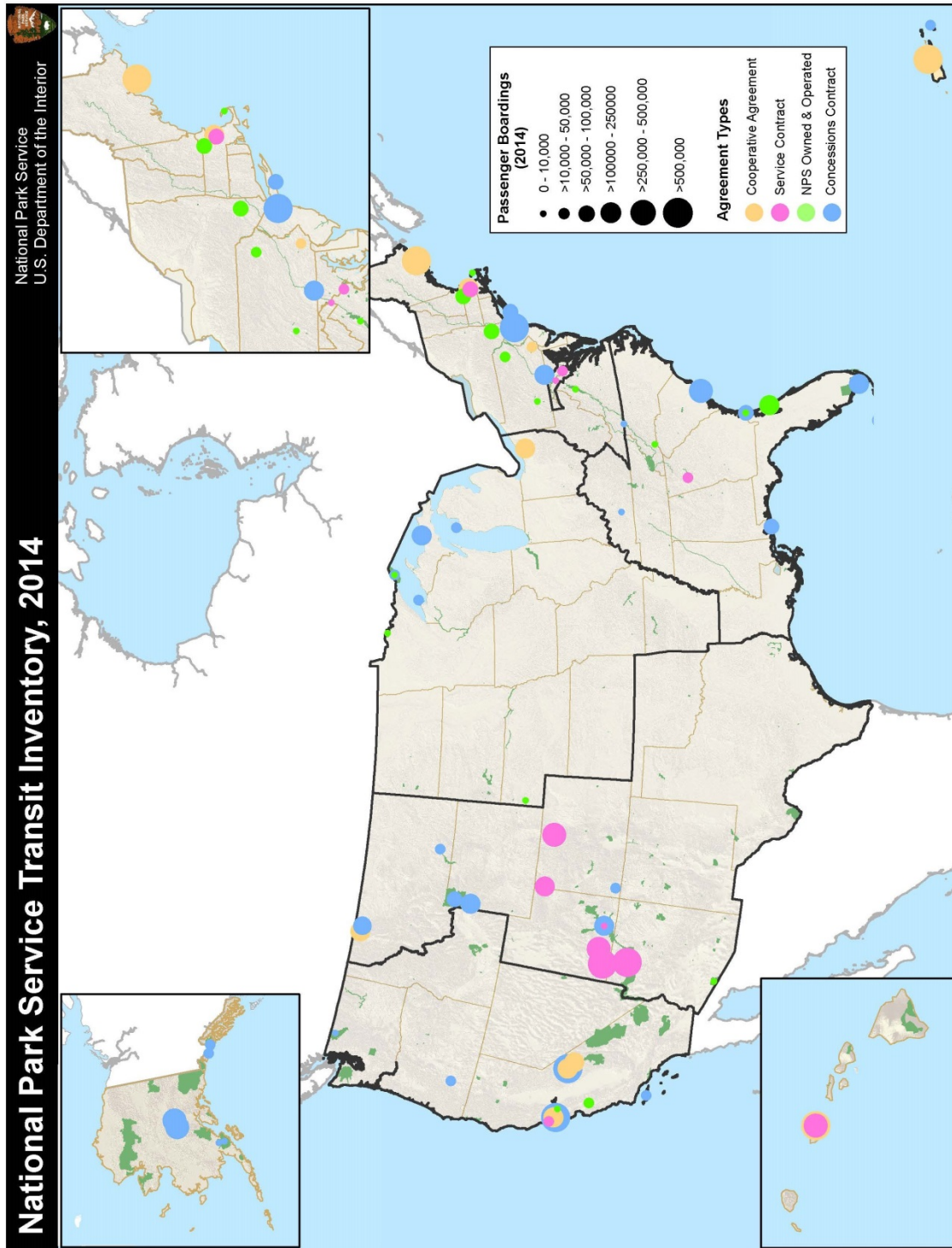


Figure 4: System locations, business models, and passenger boardings (N=121 systems)

Source: 2014 NPS National Transit Inventory data

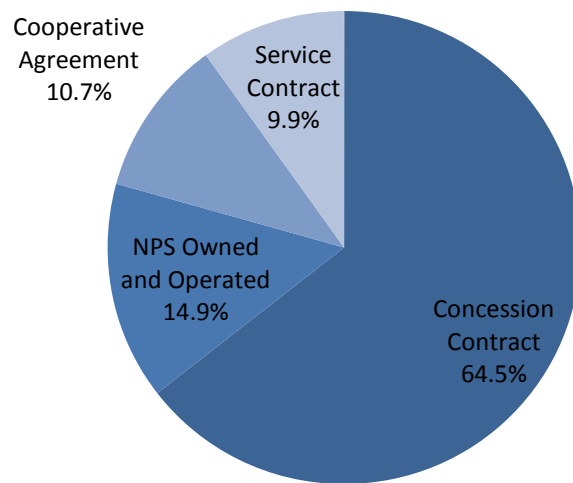


Business Models

Figure 5 shows that 78 (64.5%) of the 121 identified transit systems operate through concession contracts under which a concessioner pays the NPS a franchise fee to operate inside a unit. 18 (14.9%) transit systems are owned and operated exclusively by the NPS. 13 (10.7%) of the transit systems are operated under a cooperative agreement with another government agency or nonprofit. Only 12 (9.9%) of the transit systems are operated by a private firm under a service contract, although, as illustrated in Figure 3 and Figure 9, these 12 systems accounted for a disproportionately high number of passenger boardings (36.5%).

Figure 5: Systems by business model (N=121 systems)

Source: 2014 NPS National Transit Inventory data



Passenger Boardings

In 2014 there were 36.5 million passenger boardings across all NPS transit systems.⁶ If the 121 identified systems were considered one enterprise compared to transit agencies across the country in the National Transit Database, that enterprise would rank 48th in the country in terms of passenger boardings.⁷ For illustrative purposes, this would put NPS transit on-par with the primary transit systems in mid-sized cities like Cleveland, Ohio and Austin, Texas. Excluding concession contracts and cooperative agreements, in which NPS tends to have a much smaller financial stake, NPS owned and operated systems and service contract systems reported 12.9 million trips in 2014, suggesting NPS alone has the equivalent of the 105th largest transit system in the country.

Table 2 summarizes the methodologies park units use to count boardings. Systems indirectly recorded most passenger boardings through ticket sales. The STLI/ELIS system alone accounts for 10.9 million of those boardings. Systems directly counted 17.9 million boardings through manual or automated counts.

Table 2: Count methodology (N = 114 systems)

Source: 2014 NPS National Transit Inventory data

Count Methodology	# of Systems ⁸	Passenger Boardings (in millions)
Ticket Sales	49	17.7
Manual Counts	43	16.9
Estimated	21	0.6
Automated Counter	2	1.0
Other	2	0.1

Approximately 85% (30.9 million) of boardings on NPS transit systems in 2014 are attributable to the 10 highest use transit systems (by boardings). Table 3 summarizes these systems and shows passenger boardings for 2014. Passenger boardings increased for all of the top ten systems. As explained previously, several factors impacted passenger boardings in 2013, such as the government shutdown in October 2013 and the closure of Statue of Liberty and Ellis Islands due to Hurricane Sandy. There is a trend for not only the top ten systems, but also across the other NPS transit systems of increased passenger boardings: 61 out of the 112 systems that reported passenger boardings in both 2013 and 2014 experienced an increase. Figure 6 shows the change in passenger boardings for each year of the transit inventory.

⁶ 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. Although difficult to collect due to a lack of survey data, future inventory efforts may consider directly documenting the number of passengers.

⁷ Federal Transit Administration National Transit Database. <http://www.ntdprogram.gov/ntdprogram/>. 2013 data is the most recent available data set.

⁸ Eight systems did not report passenger boardings or count methodology, although four of them did report passenger boardings for the 2013 inventory. For four out of these eight systems, the data collection team was able to infer count methodology based on business models and system description.

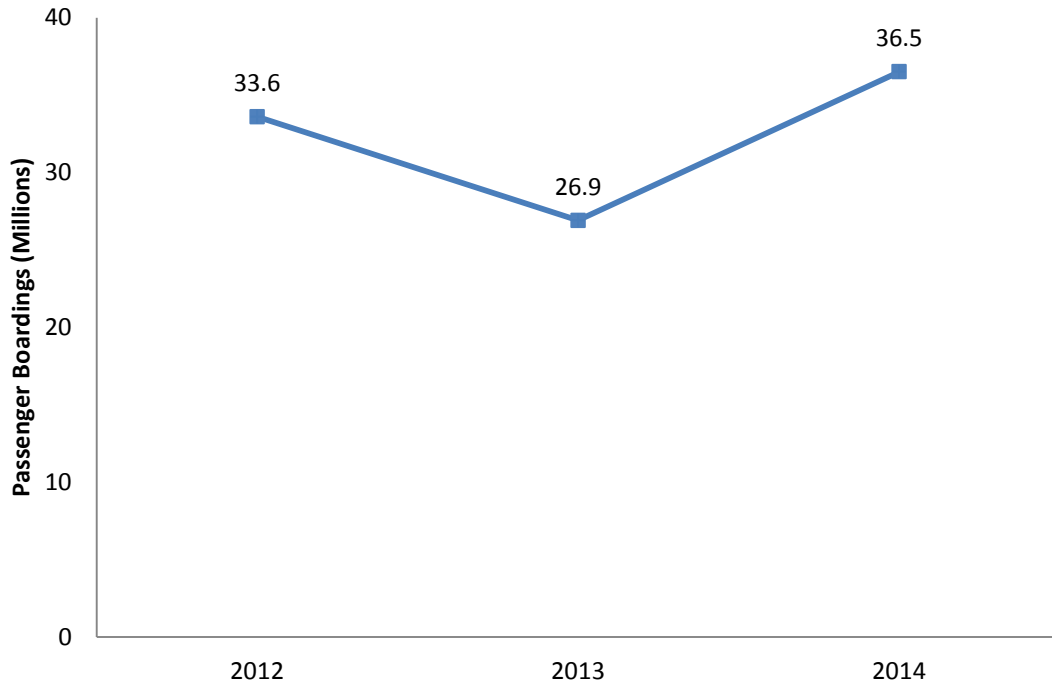
Table 3: Passenger boardings for the 10 highest use transit systems

Source: 2014 NPS National Transit Inventory data

Rank	Park	System Name	2014 Boardings	Business Model
1	STLI/ELIS	Statue of Liberty Ferries	10,916,939	Concession Contract
2	GRCA	South Rim Shuttle Service	6,894,015	Service Contract
3	ZION	Zion Canyon Shuttle	4,031,441	Service Contract
4	GOGA/ALCA	Alcatraz Cruises ferry	3,337,356	Concession Contract
5	VALR	USS Arizona Memorial Tour	3,241,628	Cooperative Agreement
6	SAJU	San Juan Trolley	610,842	Cooperative Agreement
7	ACAD	Island Explorer & Bicycle Express	503,224	Cooperative Agreement
8	YOSE	Mariposa Grove Shuttle	475,621	Concession Contract
9	ROMO	Bear Lake & Moraine Park shuttle, Hiker Shuttle to Estes Park	437,064	Service Contract
10	VALR	Ford Island Tour	429,793	Service Contract

Figure 6: Passenger boardings over time (N=114 systems)

Source: 2012, 2013, and 2014 NPS National Transit Inventory data



The Intermountain and Northeast NPS regions each reported slightly more than 12 million passenger boardings in 2014, far exceeding other regions; however, if one were to remove the ten highest use systems from consideration, each region ranged from 400,000 to 1.6 million passenger boardings (Figure 6).

Figure 6: Passenger boardings by NPS region (N=114 systems)

Source: 2014 NPS National Transit Inventory data

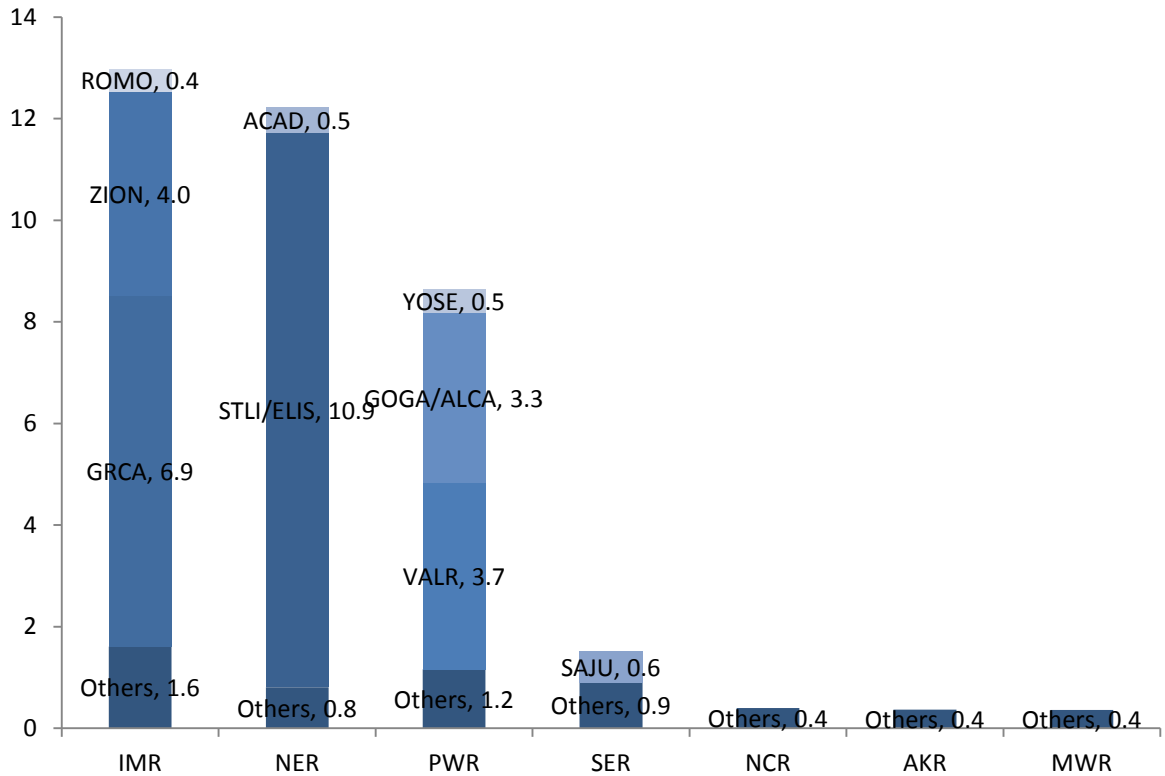
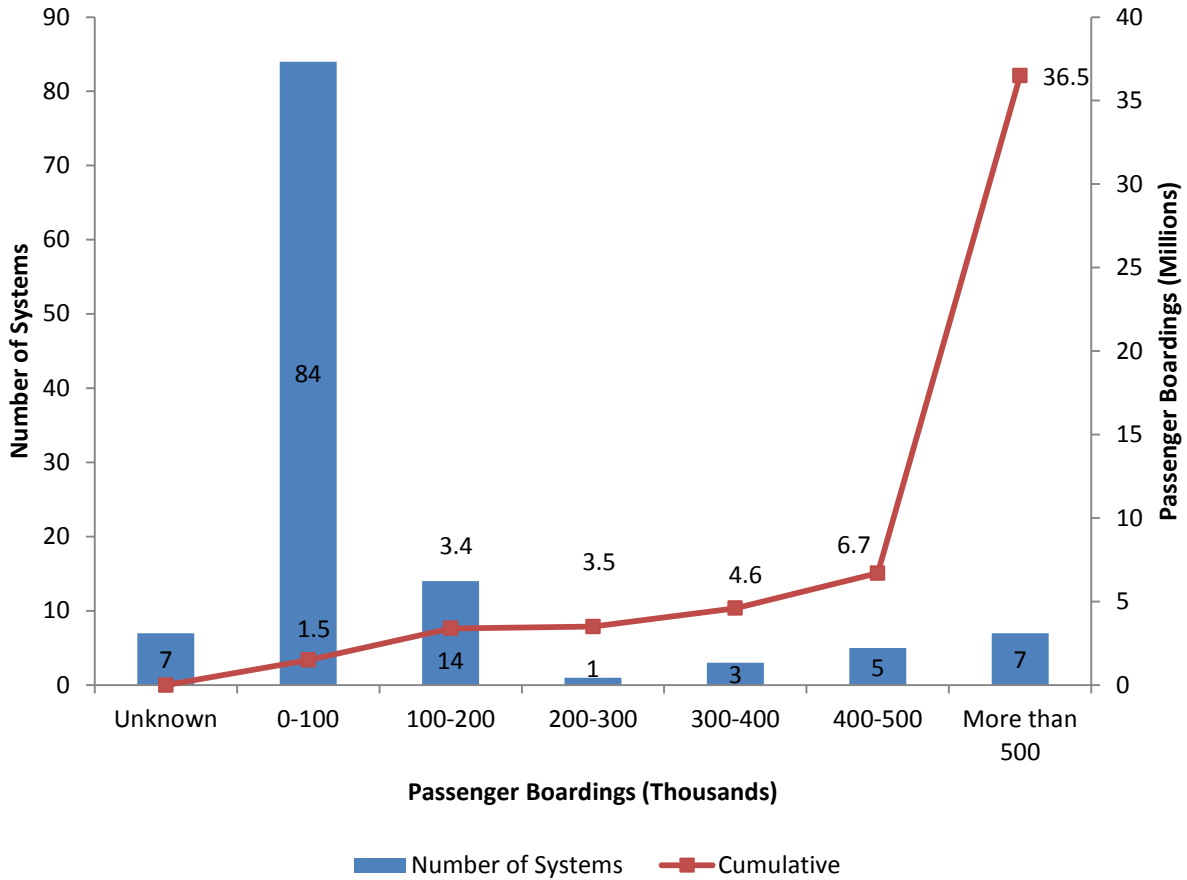


Figure 7 depicts the number of systems at different levels of boardings. 84 of the transit systems had less than 100,000 passenger boardings in 2014 (including 73 systems below 50,000 passenger boardings).

Figure 7: Systems by passenger boardings (N=121 systems)

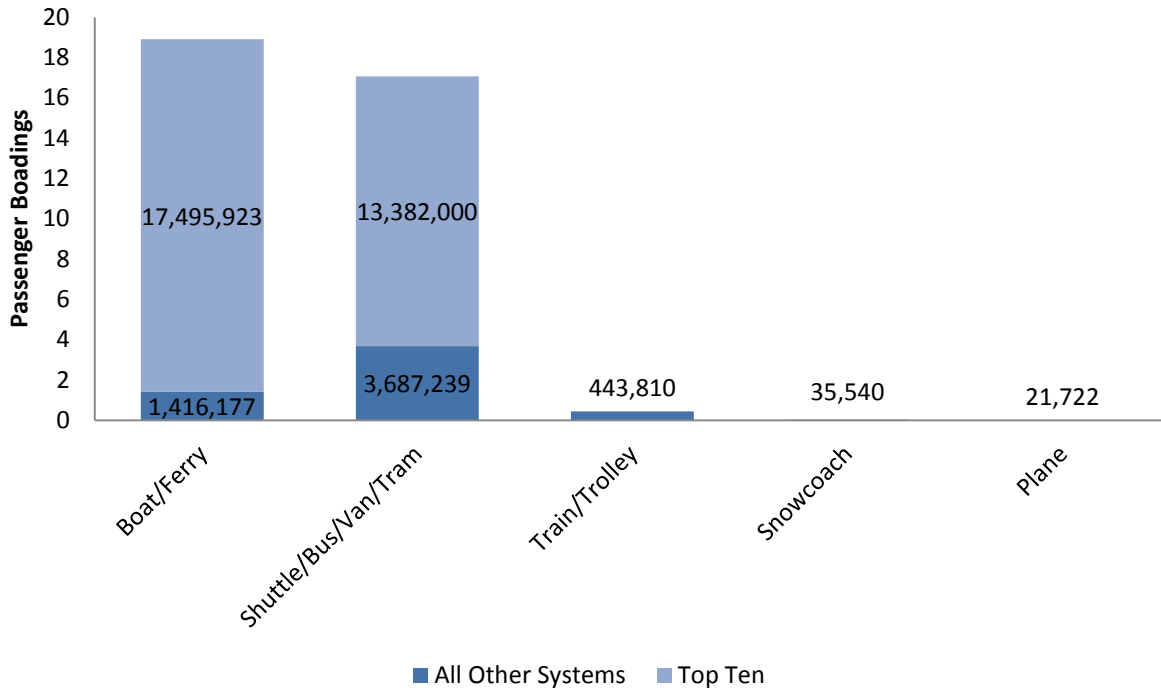
Source: 2014 NPS National Transit Inventory data



Over half of passenger boardings were on boats/ferries (52%) and just under half were on shuttles/buses/vans/trams (47%). Trains/trolleys, planes, and snowcoaches accounted for 1.4% of all passenger boardings. However, excluding the ten highest use systems, the share of passenger boardings for boats/ferries declined to 3.7% (see Figure 8).

Figure 8: Passenger boardings by mode (N=114 systems)

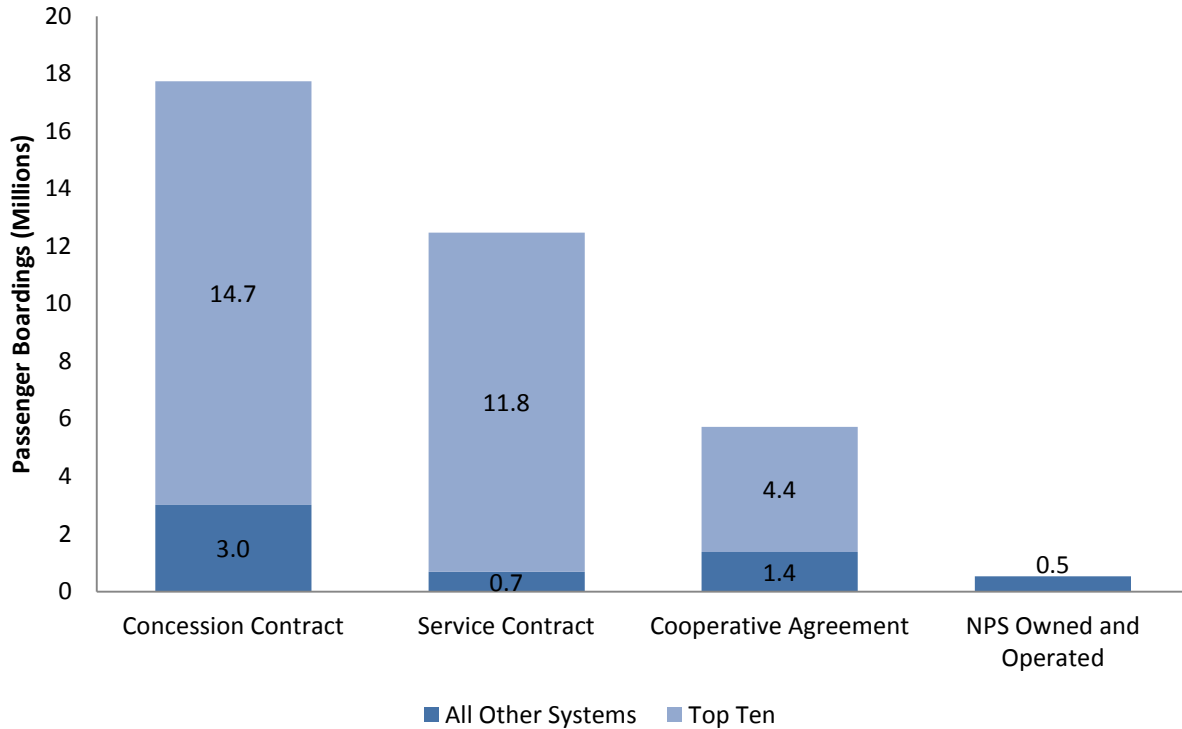
Source: 2014 NPS National Transit Inventory data



Slightly less than a majority of passenger boardings (48.6%) took place on systems operated under concession contracts. 34.2% took place under service contracts, 15.7% under cooperative agreements, and less than 1% under NPS owned and operated systems (see Figure 9). The 10 highest use systems, three of which are concession contracts and four of which are service contracts, contribute greatly to those business models majority of boardings.

Figure 9: Passenger boardings by business model (N=114 systems)

Source: 2014 NPS National Transit Inventory data

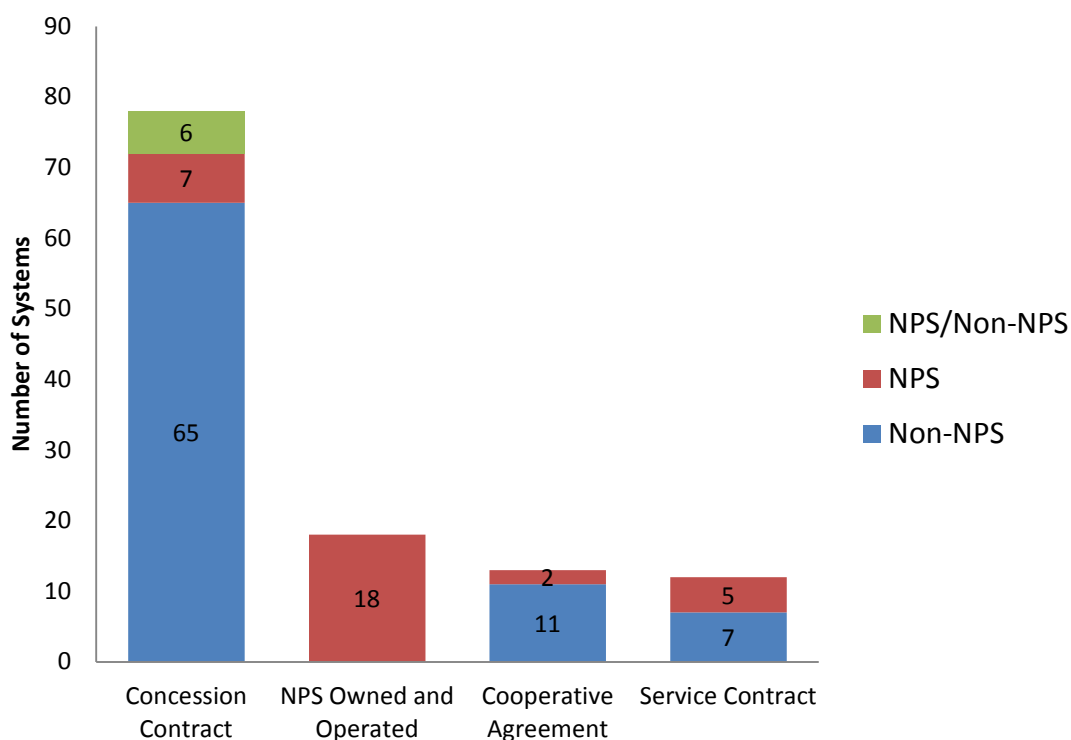


Vehicle Fleets and Fuel Types

A large percentage of the transit systems (64.5%) operate under concession contracts, of which seven systems utilize vehicle fleets owned exclusively by NPS. 18 (14.9%) of the transit systems are owned and operated exclusively by NPS. These systems tend to be small and provide critical access to a park or park site (five systems), are interpretive tours (six systems), provide service for special needs visitors, or are a park transportation feature not easily provided by a private operator. 13 (10.7%) of the transit systems are operated under a cooperative agreement. 12 (9.9%) transit systems are operated under a service contract, of which 5 have fleets owned by NPS (see Figure 10).

Figure 10: Fleet ownership by business model (N=121 systems)

Source: 2014 NPS National Transit Inventory data



The NPS transit fleet is composed of diverse vehicles operating on both conventional and alternative fuels. The NPS-owned fleet (272 vehicles) is 60.9% classified as alternative fuel vehicles. The much larger (708 vehicle) non-NPS-owned fleet is 13% alternative fuel vehicles (see Figure 11 and Figure 12). Most systems operate between 1 and 10 vehicles and most larger systems are not owned by the NPS (see Figure 13).

Figure 11: Fleet: Conventional vs. Alternative fuel vehicles by ownership (N=982 vehicles)

Source: 2014 NPS National Transit Inventory data

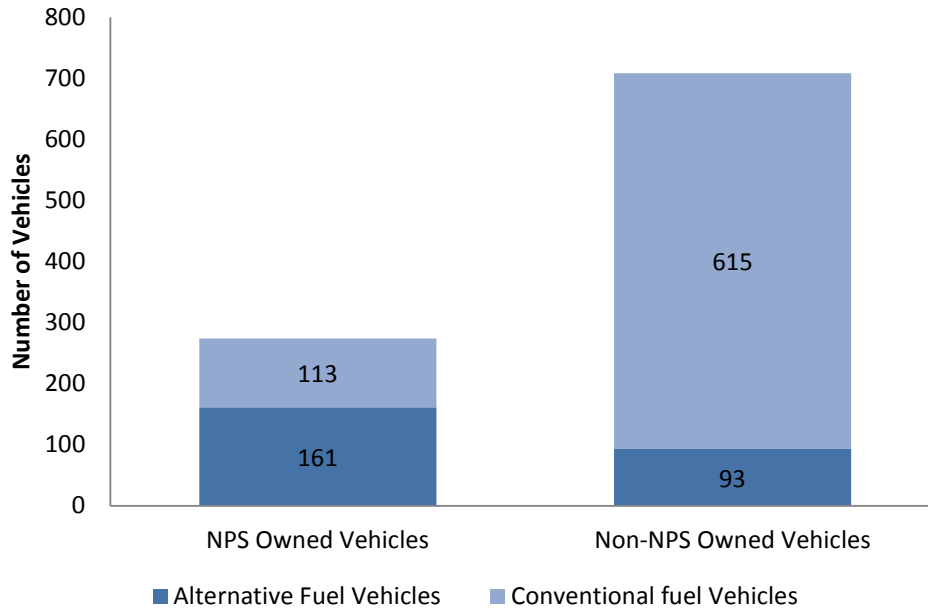


Figure 12: Number of vehicles by fuel type (N=982 vehicles)

Source: 2014 NPS National Transit Inventory data

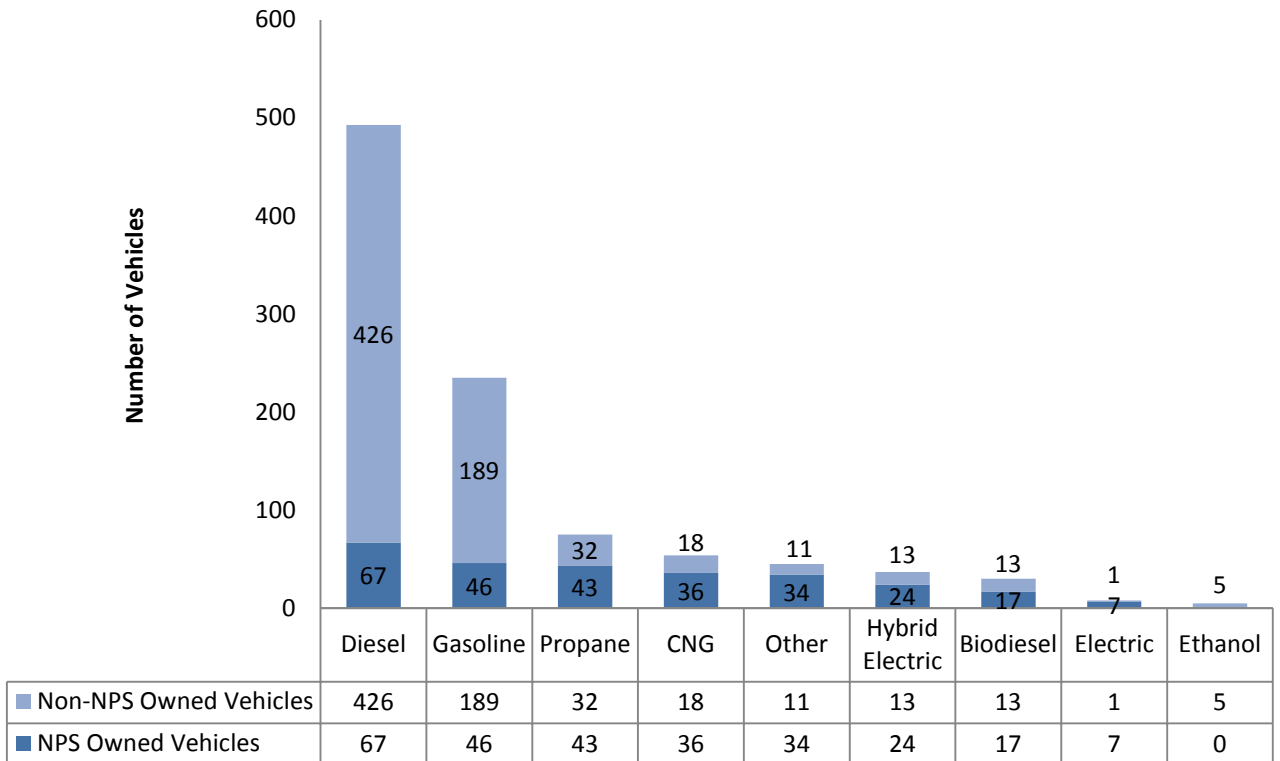
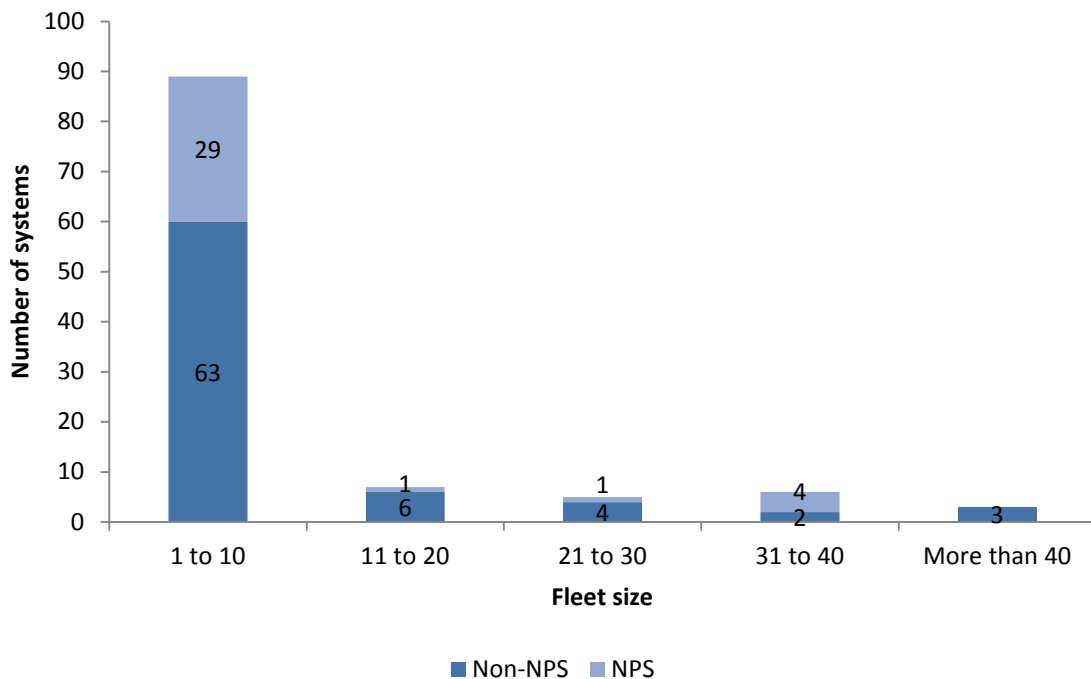


Figure 13: Number of systems by fleet size (N = 113 systems)

Source: 2014 NPS National Transit Inventory data



Performance-Oriented Findings

Annual CO₂ Emissions

The study team documented 12,206 metric tons of CO₂ emissions from 46 shuttle / bus / van / tram systems. This includes 5,722 metric tons of CO₂ emissions from NPS-owned shuttle / bus / van / tram systems. To put this into perspective, the Federal Highway Administration reports that in 2013 the average driver in the U.S. drove 11,397 miles; 3,384 such drivers would generate the equivalent of the reported shuttle / bus / van / tram system emissions.

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 2013 Inventory, the study team used a range of estimates for net CO₂ emissions based on a corresponding range of transit vehicle occupancies. Table 4 and Figure 14 show these net emissions by vehicle ownership under scenarios for 46 shuttle / bus / van / tram systems where parks provided data on service miles.⁹ For very low occupancy levels there are negative 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 16,992 metric tons of CO₂ (see Appendix D for methodology).

Table 4: Estimated net CO₂ emissions (metric tons) avoided by vehicle ownership (N = 45 systems)

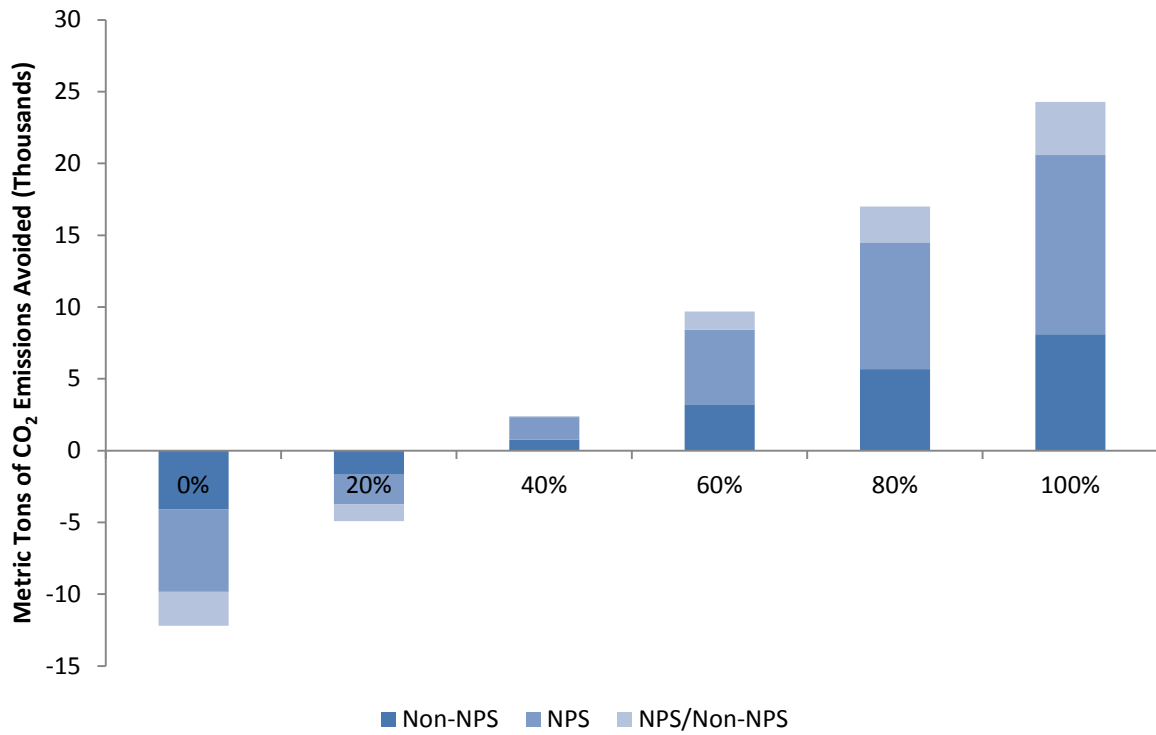
Source: 2014 NPS National Transit Inventory data

Assumed Transit Vehicle Occupancy	Non-NPS-Owned Systems	NPS-Owned System	NPS/Non-NPS-Owned Systems	Total
0%	-4,113	-5,723	-2,371	-12,206
20%	-1,667	-2,082	-1,157	-4,907
40%	778	1,558	57	2,393
60%	3,223	5,199	1,270	9,693
80%	5,669	8,839	2,484	16,992
100%	8,114	12,479	3,698	24,292

⁹ Boat/ferry systems do not avoid 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.

Figure 14: Estimated net CO₂ emissions avoided at various occupancy levels (N = 46 systems)

Source: 2014 NPS National Transit Inventory data



Average Age of Vehicles by Vehicle Type

Many non-NPS-owned vehicles are 15 years old or greater, which indicates that private sector partners may face significant recapitalization needs in the coming years (see Figure 15). In some cases, this could have implications for a contractor's financial ability to rebid a contract.

Figure 15: All Vehicles by Age Class (N = 664 vehicles)

Source: 2014 NPS National Transit Inventory data

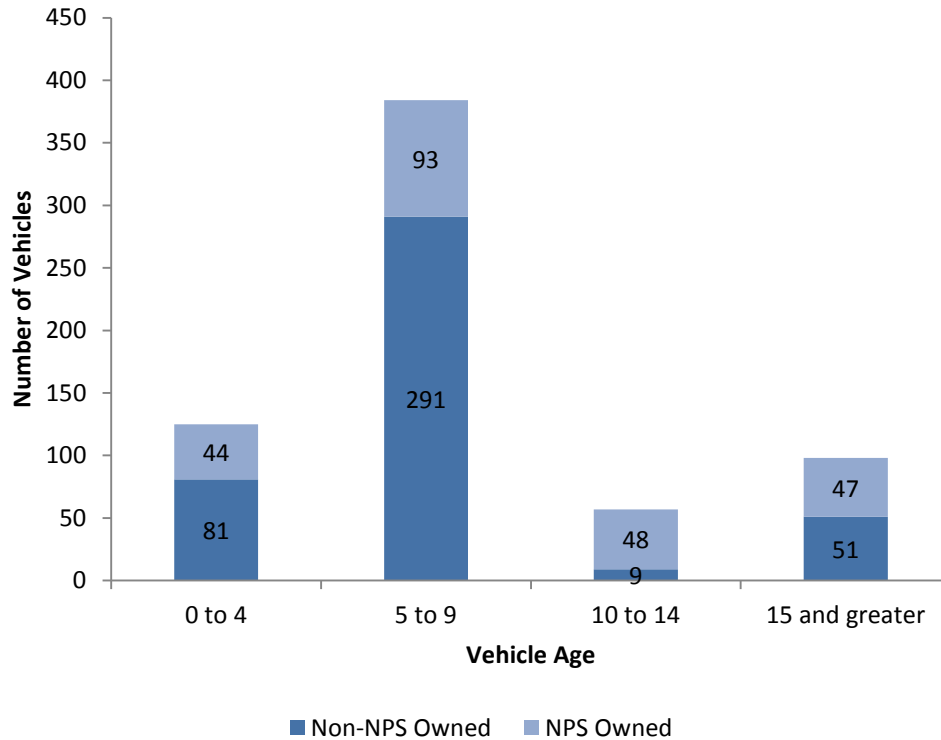


Table 5 reports the aggregate average age for NPS-owned transit vehicles servicewide. The average age for some vehicle types, including light, medium, and heavy-duty shuttles and medium-duty transit vehicles are approaching recommended service life. Some parks may need to examine odometer readings on each vehicle to develop more precise service life estimates since NPS tends to use these vehicles more lightly than traditional transit agencies. The project team is working with NPS staff and FBMS data to understand NPS-owned vehicle service life at a more granular level.

Table 5: Vehicle age for NPS transit vehicle types (N=207 vehicles)

Source: 2014 NPS National Transit Inventory data

Vehicle Type	Average Age	Service Life (years)	Number of Vehicles
6-12 pax electric tram	3.8	7	4
Passenger Van	4.0	8	7
Light-Duty Shuttle	7.0	10	34
Medium-Duty Shuttle	7.5	10	26
Heavy-Duty Shuttle	6.7	10	52
Medium-Duty Transit	13.6	20	29
Heavy-Duty Transit	7.1	20	40
Ferry/Boat	14.7	N/A	11
Train/Trolley	80.7	N/A	6

Projected Recapitalization Costs

Using vehicle ages reported by NPS transit systems and standard replacement costs and service life assumptions shown in Appendix E, the project team estimates \$1.4 million in overdue vehicle recapitalization costs for NPS-owned shuttle / bus / van / tram rolling stock (see Table 6). Each park unit is responsible for determining when a vehicle needs to be replaced. Service life is highly dependent upon utilization, not only vehicle age; therefore, more detailed information is needed.

Table 6: Estimated NPS-owned shuttle/bus/tram/van overdue recapitalization needs, 2008-2014 (N = 209 vehicles)

Source: 2014 NPS National Transit Inventory data

Year	Overdue Recapitalization	Number of Vehicles Requiring Replacement (by Type)				Units
		Passenger Van	Light-Duty Shuttle	Medium-Duty Shuttle	Heavy-Duty Shuttle	
2008-2014	\$1,385,000	1	3	9	4	EUON, PINN, ZION, CACO

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 \$30.4 million in rolling stock capital costs between 2015 and 2026. Several vehicles, according to the project team's assumptions, would have to be replaced twice during this time period. 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 GLAC, GRCA, and ZION (see Table 7).

Table 7: Estimated NPS-owned shuttle/bus/tram/van rolling stock capital needs, 2015-2026 (N = 207 vehicles)

Source: 2014 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)*
		Passenger Van	Light-Duty Shuttle	Medium-Duty Shuttle	Heavy-Duty Shuttle	6-12 Pax Electric Tram	Medium-Duty Transit	Heavy-Duty Transit	
2016	\$1,410,000		13	3	1	1			CARL, GLAC, ZION, HAFE, CACO
2017	\$175,000	2		1		1			CUIS, ORPI, PINN
2018	\$4,730,000	1	6	1	26	2			HOFR/ELRO/AMA, SHEN, GLAC, GRCA
2019	\$1,210,000	1	4	4	4				CUIS, GLAC, NOCA/LACH, GRCA, HAFE
2020	\$7,870,000			4	6		27		MEVE, SCBL, GLAC, YOSE, ZION
2021	\$1,340,000	2	2	4	4				CUIS, JOFL/ALPO, YOSE, KEMO, GRCA, CACO
2022	\$1,450,000						1	3	ZION, ADAM
2023	\$305,000		3			1			CARL, GLAC, EUON
2024	\$15,000					1			CUIS
2025	\$10,590,000	3						24	EUON, ORPI, YOSE, HAFE
2026	\$1,325,000	1	13		1		2		ZION, SHEN, GLAC, HAFE
Grand Total	\$30,420,000								

* In order to estimate a servicewide transit vehicle replacement cost, replacement years and costs for individual systems are estimated using servicewide 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

As suggested in the 2013 report, the project team coordinated with other strategic program areas within NPS on data collection and alignment with existing asset management database. The project team will continue coordination with these group and other stakeholders:

- **Commercial Services Program**
- **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 (FBMS) group**
- **Visitor Use Statistics Office**

The following lessons learned during this year's data collection period will be incorporated to improve future inventories:

- **Create new and/or refine existing data elements.** The project team will continue to coordinate with NPS branches to refine the number of fields in the data call and the way in which questions are asked. In particular, the project team will focus on coordination with ATSLAM, FBMS, and SOCC to refine vehicle data.
- **Improve data collection online tool.** While the website was an improvement from previous years, the online tool's data input will be improved and further integrated with FBMS. Additionally, the password-protected website will be updated to create a more official and digestible layout for parks.
- **Provide system-level data to staff.** With three years of data collected, the project team will disseminate reports and embedded graphics to disseminate a time series of system-level data to park staff.
- **Expand emissions analysis.** The emissions analysis can be greatly expanded in a separate report. The project team will coordinate with the Sustainable Operations and Climate Change Branch to understand ways in which this reporting will be most useful.
- **Expand service life and replacement costs analysis.** With further FBMS integration, the project team may be able to use vehicle odometer readings to create a more granular analysis of projected replacement costs.

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

Shawn Norton
Sustainable Operations and Climate Change Branch

Kurt Rausch
Commercial Services Program

Alaska Region

Paul Schrooten
Alaska Region

Melanie Berg
Glacier Bay National Park

Billie Ford
Katmai National Park

Jim LeBel
Denali National Park

Intermountain Region

Debra Frye
Intermountain Region

Sena Wiley
Intermountain Region

Jack Burns
Zion National Park

Daniel Cloud
Bryce Canyon National Park

Carl Elleard
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

Doyle Carson
Dinosaur National Monument

Dale Reinhart
Yellowstone National Park

Donna Sisson
Grand Teton 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

Jennifer McMahon
Cuyahoga Valley National Park

Marshall Plumer
Isle Royale National Park

Chuck Remus
Voyageurs National Park

John Patmore
Pictured Rocks National Lakeshore

Chris E. Smith
Apostle Islands National Lakeshore

National Capital Region

Makayah Royal
National Capital Region

Duane Erwin
Wolf Trap National Park
for the Performing Arts

Dick Swihart
National Mall & Memorial Parks

Northeast Region

Peter Steele
Northeast Region

Mark Alexander
Northeast Region

Deborah Conway
Steamtown National Historic Site

Christina Briggs
Lowell National Historical Park

John Kelly
Acadia National Park

Deirdre Gibson
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

Dave Ashe
Channel Islands National Park

Dawn Ryan
Sequoia National Park

Jennifer Evans
Crater Lake National Park

Jessica Carter
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

Marvin Mann
Yosemite National Park

Eileen Martinez
World War II Valor in the Pacific National Monument

Sheri Odgen
Yosemite National Park

Mark Rich
Mammoth Cave 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

Mark Davis
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

Joseph Hughes
Cumberland Island National Seashore

Nancy Walther
Kennesaw Mountain National Battlefield Park

Lindsey Phillips
Gulf Islands National Seashore

Appendix B – Definition of Transit

The NPS WASO 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;¹⁰
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; and¹¹
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 Managers and the Federal Lands Highway Program Service-wide Maintenance Advisory Committee (FLHP-SMAC). In response to challenges encountered during the course of the inventory, the project team made small changes to the original draft definition to improve clarity. The team applied the definition uniformly to all potential systems to determine whether or not each should be included in the inventory.

In formulating the draft definition, the NPS ATP pursued two tandem goals: agreement and objectivity. As the seven regions of the park service have unique management, assets, services, needs, and approaches it was unlikely that a single definition could meet all needs entirely, but one goal was to create a single definition that all regions and WASO could agree upon and that met most of everyone’s needs. The second goal was to create an objective definition such that two different, reasonable people would apply the definition in the same way.

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.*”

¹⁰ 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.

¹¹ 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.”

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 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 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 Manager 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 – 2014 NPS National Inventory System List

Critical Access Systems

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
STLI/ ELIS	NER	Statue of Liberty Ferries	Boat/Ferry	10,916,939	Non-NPS	Concession Contract	Ben Hanslin
ZION	IMR	Zion Canyon Shuttle	Shuttle/Bus /Van/Tram	4,031,441	NPS	Service Contract	Jack Burns
GOGA/ ALCA	PWR	Alcatraz Cruises ferry	Boat/Ferry	3,337,356	Non-NPS	Concession Contract	Jessica Carter
VALR	PWR	USS Arizona Memorial Tour	Boat/Ferry	1,121,580	Non-NPS	Cooperative Agreement	David Stransky
SAJU	SER	San Juan Trolley	Shuttle/Bus /Van/Tram	610,842	NPS	Cooperative Agreement	Julia Treu-Fowler
SEKI	PWR	Giant Forest Shuttle	Shuttle/Bus /Van/Tram	424,310	Non-NPS	Cooperative Agreement	Dawn Ryan
FOSU	SER	Ferry service	Boat/Ferry	317,908	Non-NPS	Concession Contract	Mark Davis
DEPO	PWR	Reds Meadow Shuttle Bus	Shuttle/Bus /Van/Tram	162,562	Non-NPS	Cooperative Agreement	Deanna Dulen
BOHA	NER	BOHA Ferries	Boat/Ferry	145,227	Non-NPS	Cooperative Agreement	Giles Parker
FOMA/ CASA	SER	Ferry service	Boat/Ferry	131,340	NPS	NPS Owned and Operated	Andrew Rich
GLCA	IMR	Boat tours	Boat/Ferry	112,500	Non-NPS	Concession Contract	Carl Elleard
EISE	NER	EISE shuttle	Shuttle/Bus /Van/Tram	101,276	Non-NPS	Concession Contract	John Joyce
DRTO	SER	Ferry service	Boat/Ferry	91,832	Non-NPS	Concession Contract	William Gordon
CUIS	SER	Ferry service	Boat/Ferry	87,000	Non-NPS	Concession Contract	Joseph Hughes
ADAM	NER	Adams trolley	Shuttle/Bus /Van/Tram	68,979	NPS	Service Contract	Caroline Keinath
GUIS	SER	Ship Island Ferry	Boat/Ferry	56,008	NPS/Non-NPS	Concession Contract	Lindsey Phillips
FIIS	NER	Sailors Haven Ferry	Boat/Ferry	46,000	Non-NPS	Concession Contract	John Mahoney
MEVE	IMR	Long House Trailhead tram and Half-day ranger	Shuttle/Bus /Van/Tram	35,666	Non-NPS	Concession Contract	Allan Loy

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
		guided					
PORE	PWR	Headlands Shuttle	Shuttle/Bus /Van/Tram	32,064	Non-NPS	Service Contract	
BOHA	NER	Thompson Island Ferry	Boat/Ferry	28,787	Non-NPS	Cooperative Agreement	Giles Parker
FIIS	NER	Watch Hill Ferry	Boat/Ferry	28,000	Non-NPS	Concession Contract	John Mahoney
PINN	PWR	Pinnacle Shuttle	Shuttle/Bus /Van/Tram	24,299	NPS	NPS Owned and Operated	Debbie Simmons
BUIS	SER	Big Beards Adventure Tours	Boat/Ferry	12,174	Non-NPS	Concession Contract	Susan Duke
KEMO	SER	Shuttle Bus	Shuttle/Bus /Van/Tram	11,259	NPS	Service Contract	Nancy Walther
BUIS	SER	Caribbean Sea Adventures	Boat/Ferry	10,722	Non-NPS	Concession Contract	Susan Duke
SLBE	MWR	Manitou Island Transit	Boat/Ferry	10,064	Non-NPS	Concession Contract	Phil Akers
ISRO	MWR	MV Isle Royal Queen IV	Boat/Ferry	9,576	Non-NPS	Concession Contract	Marshall Plumer
CHIS	PWR	Island Packers	Boat/Ferry	9,533	Non-NPS	Concession Contract	Dave Ashe
EUON	PWR	NPS Shuttle	Shuttle/Bus /Van/Tram	5,860	NPS	NPS Owned and Operated	Tom Leatherman
GLCA	IMR	SR276 passenger ferry	Boat/Ferry	4,525	Non-NPS	Service Contract	Carl Elleard
ISRO	MWR	MV Voyageur II and Sea Hunter III	Boat/Ferry	3,949	NPS/Non-NPS	Concession Contract	Marshall Plumer
BUIS	SER	Teroro II, Inc.	Boat/Ferry	2,531	Non-NPS	Concession Contract	Susan Duke
BUIS	SER	Jolly Roger Charters	Boat/Ferry	1,655	Non-NPS	Concession Contract	Susan Duke
ISRO	MWR	MV Ranger III	Boat/Ferry	1,654	NPS	NPS Owned and Operated	Marshall Plumer
BUIS	SER	Llewellyns Charters	Boat/Ferry	742	Non-NPS	Concession Contract	Susan Duke
BUIS	SER	Dragonfly	Boat/Ferry	648	Non-NPS	Concession Contract	Susan Duke
ISRO	MWR	Royale Air	Boat/Ferry	569	Non-NPS	Concession	Marshall

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
		Service Inc. float plane				Contract	Plumer
CHIS	PWR	Channel Islands Aviation	Plane	531	Non-NPS	Concession Contract	Dave Ashe
CACO	NER	Coastguard Beach Shuttle	Shuttle/Bus /Van/Tram	0	NPS	NPS Owned and Operated	Karst Hooeboom
HAFE	NCR	HAFE shuttle transport	Shuttle/Bus /Van/Tram	0	NPS	Service Contract	Dennis Ebersole
MACA	SER	Cave Tours Bus Shuttle	Shuttle/Bus /Van/Tram	0	NPS/Non-NPS	Concession Contract	Mark Rich

Interpretive Tours

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
VALR	PWR	Ford Island Tour	Shuttle/Bus /Van/Tram	429,793	Non-NPS	Service Contract	David Stransky
NAMA	NCR	Open Top/Big Bus	Shuttle/Bus /Van/Tram	385,683	Non-NPS	Concession Contract	Dick Swihart
CUVA	MWR	Cuyahoga Valley Scenic Railroad	Train/Trolley	185,912	Non-NPS	Cooperative Agreement	Jennifer McMahon
DINO	IMR	Tram transit	Shuttle/Bus /Van/Tram	147,272	Non-NPS	Service Contract	Doyle Carlson
YOSE	PWR	Tram Tours and Hiker Shuttle	Shuttle/Bus /Van/Tram	135,877	Non-NPS	Concession Contract	Marvin Mann
PIRO	MWR	Pictured Rocks Cruises	Boat/Ferry	109,029	Non-NPS	Concession Contract	John Patmore
GRCA	IMR	South Rim Bus Tours	Shuttle/Bus /Van/Tram	94,928	NPS	Concession Contract	Pamela Edwards
EVER	SER	Gulf Coast and Flamingo Boat Tours	Shuttle/Bus /Van/Tram	87,764	Non-NPS	Concession Contract	William Gordon
EVER	SER	Shark Valley Tram Tour	Shuttle/Bus /Van/Tram	74,879	Non-NPS	Concession Contract	William Gordon
GLAC	IMR	Glacier Park Boat Company - interpretive boat tours	Boat/Ferry	70,136	Non-NPS	Concession Contract	Jean Tabbert
YOSE	PWR	Big Trees Tram Tour	Shuttle/Bus /Van/Tram	62,276	NPS	Concession Contract	Marvin Mann

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
		(Mariposa Grove Tram)					
GLCA	IMR	Flatwater tour	Boat/Ferry	52,100	Non-NPS	Concession Contract	Carl Elleard
GLAC	IMR	Red Bus Tours	Shuttle/Bus /Van/Tram	41,616	NPS	Concession Contract	Jean Tabbert
VAFO	NER	History of Valley Forge Trolley Tour	Shuttle/Bus /Van/Tram	33,282	Non-NPS	Cooperative Agreement	Deirdre Gibson
APIS	MWR	Excursion boat	Boat/Ferry	32,774	Non-NPS	Concession Contract	Chris E. Smith
YELL	IMR	Historic Yellow Bus tours	Shuttle/Bus /Van/Tram	21,752	NPS	Concession Contract	Dale Reinhart
CRLA	PWR	Crater Lake Boat Tour	Boat/Ferry	19,505	Non-NPS	Concession Contract	Jennifer Evans
YELL	IMR	Xanterra Parks & Resorts interpretive snowcoaches tours	Snowcoach	14,523	Non-NPS	Concession Contract	Dale Reinhart
NOCA/ LACH	PWR	Rainbow Falls Tours	Shuttle/Bus /Van/Tram	12,289	NPS	Concession Contract	Annelise Lesmeister
YELL	IMR	Xanterra Parks & Resorts interpretive bus tours	Shuttle/Bus /Van/Tram	11,740	NPS/Non-NPS	Concession Contract	Dale Reinhart
YELL	IMR	See Yellowstone Alpen Guides (YELL 501,502)	Snowcoach	11,228	Non-NPS	Concession Contract	Dale Reinhart
LIBI	IMR	LIBI bus tours	Shuttle/Bus /Van/Tram	10,483	Non-NPS	Concession Contract	Ken Woody
CRLA	PWR	Rim Drive Trolley Tour	Shuttle/Bus /Van/Tram	10,192	Non-NPS	Concession Contract	Jennifer Evans
LOWE	NER	Canal Tours	Boat/Ferry	9,131	NPS	NPS Owned and Operated	Christina Briggs
YELL	IMR	YELL snow coaches	Snowcoach	8,689	NPS/Non-NPS	Concession Contract	Dale Reinhart
GLBA	AKR	Day boat tour	Boat/Ferry	6,211	Non-NPS	Concession Contract	Melanie Berg
BLRI	SER	Sharp Top Mountain Shuttle	Shuttle/Bus /Van/Tram	5,481	Non-NPS	Concession Contract	Dawn Leonard
CUIS	SER	Land and	Shuttle/Bus	3,843	NPS	NPS Owned	Joseph

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
		Legacies Tour	/Van/Tram			and Operated	Hughes
JOFL/ ALPO	NER	Lakebed Tours	Shuttle/Bus /Van/Tram	3,531	NPS	NPS Owned and Operated	Keith Newlin
GLAC	IMR	Sun Tours	Shuttle/Bus /Van/Tram	3,236	Non-NPS	Concession Contract	Jean Tabbert
VOYA	MWR	VOYA tour boat	Boat/Ferry	2,541	NPS	NPS Owned and Operated	Chuck Remus
DENA	AKR	Airplanes owned by Fly Denali	Plane	2,274	Non-NPS	Concession Contract	Jim LeBel
ISRO	MWR	MV Sandy tour	Boat/Ferry	1,806	Non-NPS	Concession Contract	Marshall Plumer
SHEN	NER	Rapidan Camp bus	Shuttle/Bus /Van/Tram	1,470	NPS	NPS Owned and Operated	Tim Taglauer
YELL	IMR	Scenic Safaris (YELL 512,513,514, 515,516,517, 518)	Snowcoach	862	Non-NPS	Concession Contract	Dale Reinhart
ORPI	IMR	Ajo Mountain Drive tour	Shuttle/Bus /Van/Tram	566	NPS	NPS Owned and Operated	Sue Walter
YELL	IMR	Gary Fales Outfitting Inc	Snowcoach	238	Non-NPS	Concession Contract	Dale Reinhart
YELL	IMR	Buffalo Bus Touring (YELL 506,509,510)	Snowcoach	0	Non-NPS	Concession Contract	Dale Reinhart
YELL	IMR	Backcountry Adventures (YELL 504)	Snowcoach	0	Non-NPS	Concession Contract	Dale Reinhart
YELL	IMR	Yellowstone Winter tours	Snowcoach	0	Non-NPS	Concession Contract	Dale Reinhart
YELL	IMR	Teton Schience Schools Inc	Shuttle/Bus /Van/Tram	0	Non-NPS	Concession Contract	Dale Reinhart
YELL	IMR	Yellowstone Year-Round Safaris	Shuttle/Bus /Van/Tram	0	Non-NPS	Concession Contract	Dale Reinhart

Mobility to or Within a Park

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
GRCA	IMR	South Rim Shuttle Service	Shuttle/Bus /Van/Tram	6,894,015	NPS	Service Contract	Pamela Edwards
ACAD	NER	Island Explorer & Bicycle Express	Shuttle/Bus /Van/Tram	503,224	Non-NPS	Cooperative Agreement	John Kelly
YOSE	PWR	Mariposa Grove Shuttle	Shuttle/Bus /Van/Tram	475,621	NPS	Concession Contract	Marvin Mann
ROMO	IMR	Bear Lake & Moraine Park shuttle, Hiker Shuttle to Estes Park	Shuttle/Bus /Van/Tram	437,064	Non-NPS	Service Contract	John Hannon
BRCA	IMR	Bryce Canyon Shuttle and Rainbow Point Shuttle	Shuttle/Bus /Van/Tram	412,713	Non-NPS	Service Contract	Daniel Cloud
DENA	AKR	Bus Tours and Shuttle Service	Shuttle/Bus /Van/Tram	332,101	NPS/Non-NPS	Concession Contract	Jim LeBel
GRTE	IMR	Jenny Lake Shuttle Boat	Shuttle/Bus /Van/Tram	219,619	Non-NPS	Concession Contract	Donna Sisson
GLAC	IMR	Sprinter Shuttles & Optima Shuttles	Shuttle/Bus /Van/Tram	168,566	NPS	Cooperative Agreement	Stephen N. Smith
YOSE	PWR	YARTS	Shuttle/Bus /Van/Tram	111,018	Non-NPS	Cooperative Agreement	Marvin Mann
MUWO	PWR	Muir Woods Shuttle	Shuttle/Bus /Van/Tram	102,950	Non-NPS	Cooperative Agreement	Darren Brown
YOSE	PWR	Tuolumne Shuttle	Shuttle/Bus /Van/Tram	34,324	NPS	Concession Contract	Marvin Mann
HOFR/ ELRO/ VAMA	NER	Roosevelt Ride	Shuttle/Bus /Van/Tram	23,262	NPS	NPS Owned and Operated	Scott Rector
WOTR	NCR	Fairfax Connectors Wolf Trap	Shuttle/Bus /Van/Tram	10,926	Non-NPS	Service Contract	Duane Erwin

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
		Express					
SEKI	PWR	Gateway Shuttle	Shuttle/Bus /Van/Tram	9,381	Non-NPS	Cooperative Agreement	Dawn Ryan
DENA	AKR	Airplanes owned by K2	Plane	8,115	Non-NPS	Concession Contract	Jim LeBel
DENA	AKR	Airplanes owned by Talkeetna Air Taxi	Plane	7,594	Non-NPS	Concession Contract	Jim LeBel
GLBA	AKR	Airport Shuttle	Shuttle/Bus /Van/Tram	6,420	Non-NPS	Concession Contract	Melanie Berg
YOSE	PWR	Badger Pass Winter Shuttle	Shuttle/Bus /Van/Tram	4,462	Non-NPS	Concession Contract	Marvin Mann
KATM	AKR	KATM bus tours	Shuttle/Bus /Van/Tram	2,522	Non-NPS	Concession Contract	Billie Ford
DENA	AKR	Airplanes owned by Kantishna Air Taxi	Plane	1,667	Non-NPS	Concession Contract	Jim LeBel
SCBL	MWR	SCBL free shuttle service	Shuttle/Bus /Van/Tram	1,636	NPS	NPS Owned and Operated	Tom Schaff
GLAC	IMR	Hiker Shuttle	Shuttle/Bus /Van/Tram	1,411	Non-NPS	Concession Contract	Jean Tabbert
DENA	AKR	Airplanes owned by Sheldon	Plane	906	Non-NPS	Concession Contract	Jim LeBel
GRCA	IMR	North Rim Hiker Shuttle	Shuttle/Bus /Van/Tram	718	Non-NPS	Concession Contract	Pamela Edwards
NOCA/ ROLA	PWR	Ross Lake Hiker Shuttle	Shuttle/Bus /Van/Tram	332	Non-NPS	Concession Contract	Annelise Lesmeister
KATM	AKR	Float plane 4	Plane	138	Non-NPS	Concession Contract	Billie Ford
KATM	AKR	Float plane 7	Plane	120	Non-NPS	Concession Contract	Billie Ford
KATM	AKR	Float plane 1	Plane	115	Non-NPS	Concession Contract	Billie Ford
KATM	AKR	Float plane 2	Plane	91	Non-NPS	Concession Contract	Billie Ford
KATM	AKR	Float plane 3	Plane	75	Non-NPS	Concession Contract	Billie Ford
KATM	AKR	Float plane 5	Plane	57	Non-NPS	Concession Contract	Billie Ford

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
KATM	AKR	Float plane 6	Plane	39	Non-NPS	Concession Contract	Billie Ford

Special Needs

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
HOFR/ ELRO/ VAMA	NER	FDR Tram	Shuttle/Bus /Van/Tram	20,129	NPS	NPS Owned and Operated	Scott Rector
HOFR/ ELRO/ VAMA	NER	Val-Kill Tram	Shuttle/Bus /Van/Tram	15,689	NPS	NPS Owned and Operated	Scott Rector
CARL	SER	Electric Shuttle	Shuttle/Bus /Van/Tram	6,849	NPS	NPS Owned and Operated	Sarah Perschall

Transportation Feature

Park Code	Region	System Name	Vehicle Type	2014 Passenger Boardings	Vehicle Ownership	Agreement Type	NPS Contact Name
GRCA	IMR	Grand Canyon Railway	Train/ Trolley	164,828	Non-NPS	Concession Contract	Pamela Edwards
LOWE	NER	LOWE Historic Trolley	Train/ Trolley	62,884	NPS	NPS Owned and Operated	Christina Briggs
STEA	NER	Scranton Limited & Live Steam Excursions	Train/ Trolley	30,186	NPS	NPS Owned and Operated	Deborah Conway

Appendix D – CO₂ Emissions Methodology

To calculate annual CO₂ emissions avoided, the project team used a range of vehicle occupancy scenarios for non-electric shuttle systems (0, 20, 40, 60, 80, and 100 percent) where the park provided service miles and vehicle capacity. 38 systems met these criteria.

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

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

The team then multiplied passenger vehicle trips avoided by the number of service miles for each shuttle system to estimate avoided passenger mileage.

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

Then the team calculated fuel consumption for transit vehicles using the following assumptions:

Fuel Economy¹²

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 Type¹³

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:

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

The team also calculated the avoided fuel consumption using the average on-road fuel economy for passenger vehicles in the U.S. (25.3 miles per gallon).¹⁴

¹² 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>

¹³ <http://www.eia.gov/oiaf/i605/coefficients.html>

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

The study team then multiplied the fuel consumption figures 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.

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

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

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

⁴ University of Michigan Transportation Research Institute, Average sales-weighted fuel-economy rating, 2014. http://www.umich.edu/~umtriswt/EDI_sales-weighted-mpg.html.

Appendix E – Vehicle Replacement Assumptions

Uniform vehicle replacement costs and expected service lives were used to provide servicewide consistency in estimates of vehicle age, remaining service life, and recapitalization costs.

Assumptions	Gas/Diesel/Biodiesel/Propane Vehicle		Electric/CNG	
	Replacement Cost	Expected Life	Replacement Cost	Expected Life
Passenger Van	\$30,000	8	N/A	N/A
Light-duty Shuttle	\$75,000	10	\$125,000	10
Medium-Duty Shuttle	\$100,000	10	\$150,000	10
Heavy-Duty Shuttle	\$120,000	10	\$170,000	10
Medium-Duty Transit	\$250,000	20	\$300,000	20
Heavy-Duty Transit	\$400,000	20	\$450,000	20
School Bus	\$125,000	12	N/A	N/A
6-12 pax Electric Tram	N/A	7	\$15,000	7

*Replacement costs and expected life assumptions are 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).

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