National Park Service
U.S. Department of the Interior

Adams National Historic Park
Quincy, Massachusetts

Adams National Historical Park
Trolley Vehicle Replacement Selection Analysis

Adams NHP Trolley
Source: Volpe Center

PMIS No. 232156A
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Volpe The National Transportation Systems Center

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Report notes

This report was prepared by the U.S. Department of Transportation John A. Volpe National Transportation Systems Center, in Cambridge, Massachusetts. The project team was led by Scott Lian, of the Energy Analysis and Sustainability Division, and included Frances Fisher, of the Transportation Planning Division.

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Introduction

Adams National Historical Park (NHP) is located approximately 10 miles south of Boston in Quincy, MA (Figure 1). The park consists of three separate properties – the Visitor Center, the Birthplaces of John Adams and John Quincy Adams ("Birthplaces"), and the Old House ("Old House"), the Adams family residence that includes John Quincy Adams' Stone Library (Figure 2). In total, the park includes a historic landscape of 13 acres with 11 historic structures and the Visitor Center. The story told by Adams NHP is that of five generations of the Adams family from 1720 to 1927 including two U.S. presidents. A trolley service connects all three sites (Figure 2) and is included in the cost of the tour. Tours cost $10 for adults and are free for children under the age of 16.

Project Purpose

Adams NHP owns three trolley vehicles built by Chance Coach, which are operated and maintained under a contract. The trolleys were purchased in the early 2000s and, while their accrued mileage remains low, they have reached the end of their useful lives due in large part to vehicle parts becoming unavailable. Although the trolleys remain operational, the wheelchair lifts on the trolleys have been inoperable for several years. Both the original trolley vehicle manufacturer as well as the wheelchair lift manufacturer have since gone out of business. The Volpe Center has been tasked to carry out a review of potential replacement vehicles to allow Adams NHP to provide a fully accessible transportation service and have vehicles that can be maintained into the future.

Adams NHP has been contracting for operation of its shuttle service since 1993. The last RFP for services in 2014 received only one bid submittal. The current contract includes both operation and maintenance costs. The Volpe Center has also been tasked to review the current service contract and explore different operational approaches that may attract more competition and keep costs down.

Figure 1
Location of Adams NHP
Source: Harpers Ferry Center (http://www.nps.gov/hfc)

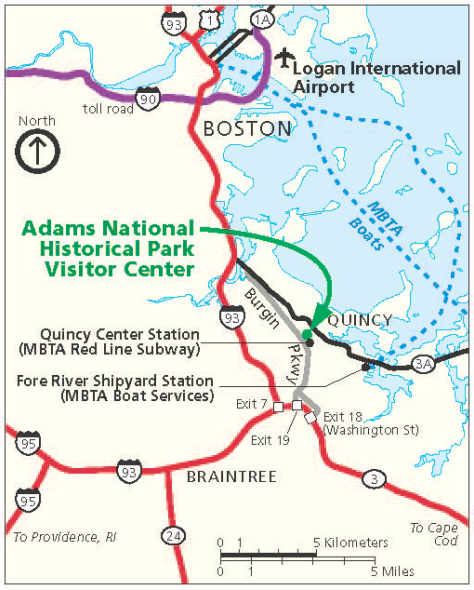
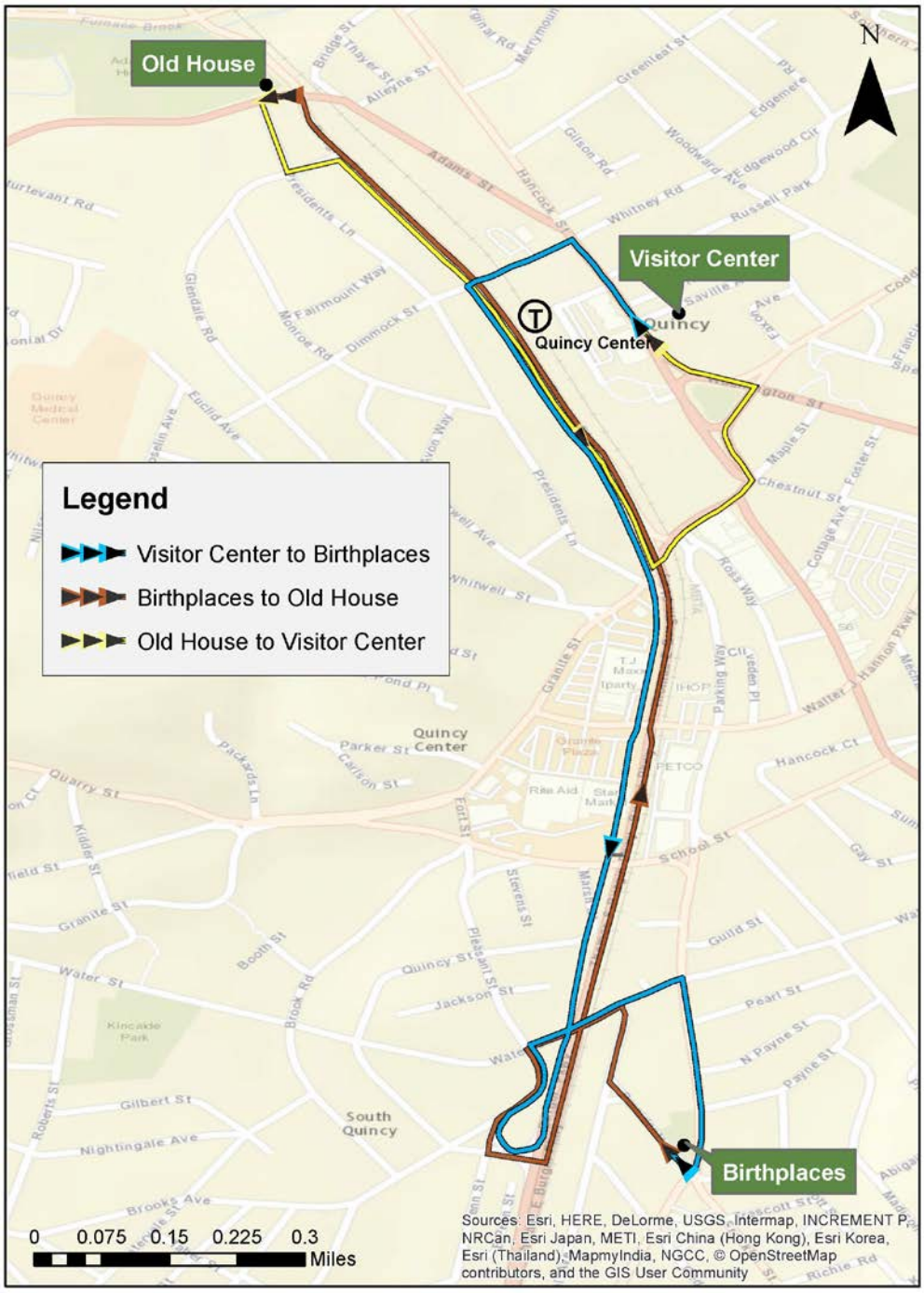


Figure 2
Adams NHP Existing Shuttle Route
Source: Volpe Center



Existing Conditions

Access to Adams NHP sites

Access by Private Vehicle

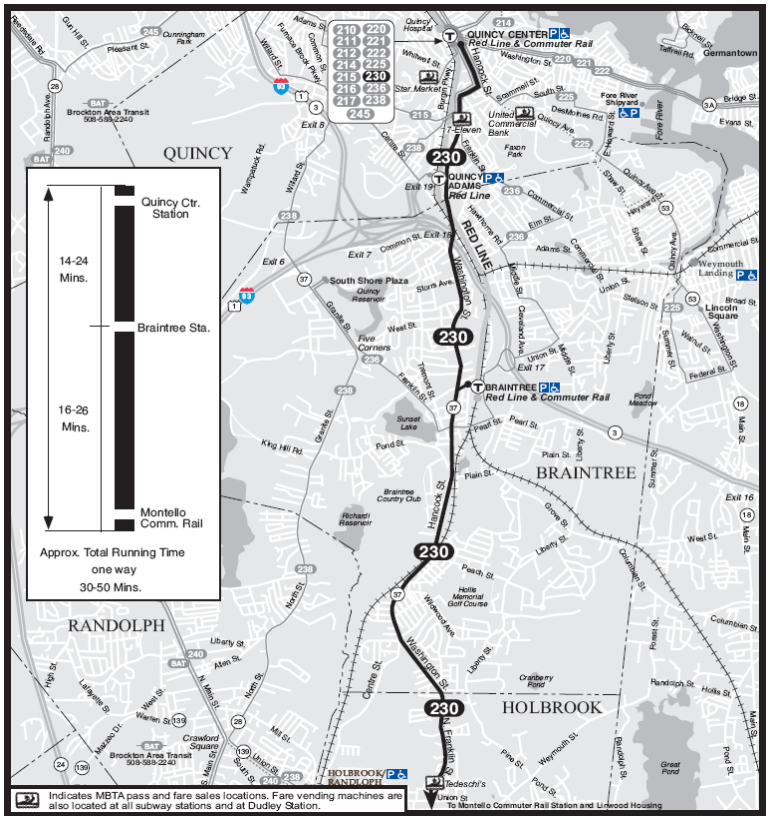
The Visitor Center is located within a multi-tenant building and offers validated parking for a parking garage at the rear of the building. Visitors are encouraged to leave their cars in favor of the trolley service as there is no on-site parking at the historic sites and very limited on-street parking. The trolley service is included in the cost of the tour. While visitors may visit the grounds of Adams NHP without a ticket, a ticket is required for the tour and entrance to the historic buildings. Tickets for the tour must be purchased at the Visitor Center.

Access by Public Transit

The Visitor Center, located in downtown Quincy, is accessible by public transit and is located less than a quarter of a mile from the Quincy Center station, which is served by the Massachusetts Bay Transportation Authority (MBTA)'s Red Line subway, three commuter lines (Greenbush, Kingston/Plymouth, and Middleborough/Lakeville), and several bus routes. The Old House site is a half-mile north of the Quincy Center station and the Birthplaces site is located approximately a mile from both Quincy Center Station and Quincy Adams Station.

MBTA Bus 230, which runs from Quincy Station to Braintree, serves the Birthplaces site, but only runs every 30 minutes to an hour on the weekdays, every hour on Saturday, and every hour and a half on Sunday (Figure 3). The Old House site can be accessed by MBTA Bus 211, 217, and 245 near the intersection of Adams Street and Newport Avenue. These routes run on a similar schedule as MBTA Bus 230, but requires visitors to cross the intersection of Adams Street and Newport Avenue and then walk down Adams Street to access the main entrance to the Old House site.

Figure 3
Map of MBTA Bus Route 230
Source: www.mbta.com



Current Trolley Service

The Adams NHP trolley service was first introduced in 1993 in order to improve visitor access to the park sites and to help minimize traffic congestion in downtown Quincy and around the individual historic sites. The Adams NHP trolley facilitates the interpretation of the park sites, and provides an enhanced visitor experience allowing visitors to move easily through the park sites in chronological sequence following the lives of the two Adams Presidents and their families from birth to death. Prior to the introduction of the trolley service, visitation at the various sites was loosely connected and navigation between the sites often confusing for people unfamiliar with the City of Quincy. Park staff view the trolley as an essential visitor service. Nearly half of all visitors currently use the trolley to visit the historic buildings. The remaining visitors either choose not to take the tour or tour only the Old House site which is a half-mile walk from the Visitor Center.

The current vehicle fleet includes three rubber-tired historic replica trolleys purchased by Adams NHP in 2002 (Figure 4). These trolleys replaced contractor-owned vehicles that were in use at the time. The current trolleys are operated by a contractor from April 19 to November 10 each year and after 10 seasons have 45,000-65,000 miles on each.[1] The trolley service is paid for using park operating funds.

[1] Each vehicle averages 4,500 to 6,500 miles annually, or 16,000 miles annually between the three vehicles.

Figure 4
Current Adams NHP Trolley
Source: Volpe Center

The trolleys leave the Visitor Center approximately every 30 minutes beginning on the quarter-hour. The trolley stops first at the Birthplaces site and then at the Old House site before returning back to the Visitor Center (Figure 2). Trolley riders receive a 30 minute guided tour at the Birthplaces site and a one hour tour at the Old House site, traveling as a group from site to site. If the visitor takes both tours, the entire trip will take approximately two hours.

The time allotted to each site allows for both a formal tour and time to walk the grounds. Tour groups are limited to 10 visitors to minimize the impact to the historic structures, which are key cultural resources for the park. During the peak season (primarily weekends in late June through September), every other trolley trip is doubled up, meaning that the trolley carries 20 passengers instead of 10 passengers and at each site the passengers are divided into two groups for tours. In the case of the Old House site, half of the visitors tour the grounds first while the other half begin a tour of the Old House (the double tours do not extend the overall tour time for any visitors). During peak times, the park feels that there is demand for more tour capacity. If wait times to go on the next available tour are too long, some visitors decide not to take the tour. In other cases people who arrive near the end of the day may find the remaining tours for the day full.

The trolley route is 3.3 miles long, with an approximate travel time of 12-15 minutes, not including passenger boarding time. The current operation is set up so that a single vehicle is in service at a given time with the shuttle dropping off one group and picking up the next group waiting to be transported to the next stop. While the current service can be provided with one vehicle, two vehicles are used each day. The first driver operates one trolley in the morning and then pulls back to the storage area once the second driver and vehicle have arrived for the afternoon shift. Conceptually, one vehicle could be used for the entire day if transport of the drivers to/from the vehicle in service could be arranged so that the vehicle in service did not need to go back to the storage area to change drivers. Even if a single vehicle is used for the entire day, access to a second backup vehicle is needed for when the vehicle in service requires maintenance.

Current Trolley Vehicle Maintenance

The current Chance Coach trolley vehicles are 12-year, 500,000 mile Altoona rated[2] vehicles and include custom wheelchair lift systems, which were required due to the narrower than industry standard door openings. The trolleys and non-standard equipment require specialized and dedicated maintenance that can prove challenging for smaller operators, especially when the vehicles and equipment are not representative of the majority of their fleet.

The wheelchair lift systems within the current trolleys failed several years ago and attempts to repair the systems have been thwarted by the manufacturer of the lift systems going out of business. Facilitating repair of the wheelchair lift systems would require either re-engineering of the current lift system or replacing the lifts with another brand that offers maintenance support. Both of these approaches were pursued by the current contract operator, Brush Hill; however, either technical or cost factors limited their rehabilitation or replacement.

Installers of Braun and Ricon brand replacement lifts confirmed the current trolley vehicles would need significant structural modifications to accommodate the wider industry-sized lift systems. Both re-engineering the lift systems through a third party or modifying the frame and chassis of the current trolleys to fit available replacement lift systems are too costly to justify spending on vehicles that are well beyond their designed lifespan of 12-years.

Need for Replacement

With the wheelchair lift systems on all three trolleys inoperable and too costly to repair, all of the current trolleys are non-compliant with access for people with disabilities (the Americans with Disabilities Act (ADA)). Furthermore, the park indicated during the site visit that the accessibility limitations extend beyond wheelchairs and visitors often struggle to climb the three large steps into the trolley. All shuttle systems operated within federal lands must accommodate all visitors, both disabled and ambulatory. The current trolleys have lasted beyond their designed life, are not accessible, and are proving more costly to maintain as they age. The park requires replacement vehicles that resolve these accessibility issues while also offering greater reliability and maintainability.

Replacement Vehicle Requirements[3]

Accessibility

Adams NHP is required by law to be compliant with the ADA and vehicles utilized for transportation of visitors must offer accessibility to all persons, including those with disabilities or in a wheelchair. These requirements include a minimum of two wheelchair positions on-board group transportation service vehicles.

A desire for vehicle "kneeling" capability and/or extending ramps is preferred over vehicles that require a wheelchair lift, as it would assist in accessibility for more than just wheelchairs. Beyond ADA compliance, the park expressed a desire to provide for the capability to accommodate visitors with strollers. "Low-

[2] Testing performed at the Altoona Bus Research and Testing Center comprises tests for: safety, structural integrity and durability, reliability, performance, maintainability, noise, fuel economy, braking systems and emissions. The series of tests have different benchmarks for a vehicle's designed-life, and vehicles are tested in 5-, 7-, 10-, and 12-year categories where the year represents the expected life of the vehicle when utilized in a transit service environment.

[3] This section covers the operational requirements for the trolley vehicles as discussed during the site visit to Adams NHP on January 20, 2017. Participants in that meeting are listed in the acknowledgements.

floor" style vehicle designs with ramps would alleviate the large steps present on the current trolley and would increase accessibility for both those with limited mobility or strollers.

Capacity

As previously noted, tours are limited to 10 visitors and during peak visitation double tours may be run, requiring a vehicle that can transport at minimum 20 passengers. Unless alternative operations plans are considered, replacement vehicle capacity should provide an equivalent capacity of at least 20 seated passengers and up to as many as 25 seated passengers. Vehicles providing any larger capacity are generally considered too large for the route.

Comfort

The current trolleys feature lacquered wooden seats, which are uncomfortable and slippery. Instances of passengers complaining about sliding back and forth on the seats during the route have been reported. The diesel engines and drivetrain on the existing vehicles are loud and intrusive. The park expressed concerns regarding noise and tailpipe emissions, and desire a quieter alternative if possible. Additionally, heating, ventilation and air conditioning (HVAC) systems are necessary as the service operates in all weather conditions.

Identity

The park currently runs unique branded trolley vehicles for the route. Park staff have articulated the importance of having a vehicle that is easily identifiable and branded for the Adams NHP. The current trolley vehicles provide an aesthetic that visitors are "stepping back in time" while visiting the historic sites. A unique vehicle wrap may be one way to achieve a desired aesthetic and branding on a new vehicle. An example of a full-body bus wrap is shown in Figure 5.

Figure 5
Before and after example of a bus wrap
Source: https://freerangequest.wordpress.com/2013/06/14/unwrapping-the-wrap-alfies-big-reveal/ completed by www.pdxwraps.com

Before

After

Other Goals

Adams NHP expressed a desire for their replacement vehicles to be environmentally friendly and as quiet as possible. The park also desires replacement vehicles that are able to be generally serviced without the requirement of maintaining custom- or "non-standard" vehicles or equipment. Vehicles built off mass-

produced platforms and those that employ industry standard equipment are preferred to ensure availability of parts and long-term maintainability.

Replacement Vehicles Considered

The National Park Service (NPS) is required to procure new vehicles from the General Services Administration (GSA); however, if the GSA does not offer a specific vehicle or similar vehicle, the park may obtain a waiver and seek a vehicle from a commercial outlet. The GSA offers vehicles through their AutoChoice program, including buses, shuttle-buses, passenger vans, wheelchair vans, and light-trucks with various bodies. The GSA does not offer any "classic trolley" vehicles and an in-kind, like-replacement trolley may be procured outside of GSA once a waiver is obtained.

Vehicle options explored below are bound by the following assumptions, based on park feedback and existing service and route conditions:

- Passenger capacity of 22+
- ADA compliant with ramps preferred versus lifts
- Climate control / HVAC
- Comfortable and safe seating (no slippery wood seats)
- Reliable and lower maintenance costs
- Quieter and cleaner emissions than current vehicles

The vehicle options to address the needs above and maintain the current trolley vehicle aesthetic include the traditional full-sized trolley and a "trolley-on-a-truck," a trolley platform built on a domestic truck chassis. Additionally, medium-duty, low-floor (MD LF) and light-duty, high-floor (LD HF) shuttle buses offer economical and reliable solutions for transporting people. Passenger vans were not pursued due to the capacity restrictions of the smaller vehicle when paired with an ADA compliant wheelchair lift. Heavy-duty vehicles rated for transit use were also not pursued, as they are a poor match for Adams NHP's relatively light service requirements and are generally more complex to operate and maintain.

Replacement vehicle types are summarized in Table 1 below. The purchase cost is approximate and final pricing will vary depending on desired vehicle options/add-ons. The reported vehicle dimensions are also approximate and represent the largest dimensions, which may include equipment, such as roof-top HVAC units, when applicable.

Table 1
Replacement Vehicle Options Considered
Source: Volpe Center Analysis

Type	Image	Purchase Cost	Rated Life (years / miles)	Pax. Capacity	Dimensions (LxWxH)	Fuels
Full size trolley		$180,000 - $300,000	12 / 500,000	20-32	29-40′ x 100″ x 126″	Diesel, Gas, Propane
Trolley-on-truck		**$120,000 - $180,000**	**5 / 150,000**	**18-24**	**21-24′ x 96″ x 126″**	**Diesel, Gas, Propane, CNG**
Medium-Duty Low Floor Bus		$200,000 - $250,000	12 / 500,000	20-30	30.5′ x 102″ x 122″	Diesel, Gas, Propane
Light-Duty High Floor Bus		$90,000 - $120,000	5 / 150,000	20-24	29′ x 96″ x 120″	Diesel, Gas, Propane

Vehicle Recommendation

The trolley-on-truck option is recommended to replace the current full-size trolley vehicles at Adams NHP for the following reasons:

"Right-sized" Capacity

Current service at Adams NHP is limited by the capacity restrictions at the resources within the park. A vehicle sized for roughly 20 passengers is ideal. A smaller vehicle option, such as a passenger van, is limited to roughly 10 passengers when equipped with a wheelchair lift. The smaller vehicle option would be too costly requiring twice as many drivers and vehicles to operate at the current level of service. On the other end of the spectrum, a large vehicle with a capacity for 30 or more passengers would be too large and cumbersome to operate along the route and the additional visitor capacity with a large vehicle are beyond what the park's resources can support at one time.

The passenger capacity and small footprint afforded by the trolley-on-truck are ideally suited for Adams NHP's needs and offer sufficient passenger capacity with enhanced maneuverability compared to the existing full-size trolleys.

Light-duty Service

Current service entails roughly 16,000 miles per year combined between both vehicles in use.[4] None of the existing vehicles will reach even half their rated life in miles by the time they are retired from service. 10-year, 300,000 mile medium-duty platforms and 12-year, 500,000 mile, heavy-duty platforms come at a premium because they are designed for all-day transit applications that accrue mileage at a much faster rate. The trolley-on-truck option is a 7-year, 200,000 mile Altoona tested vehicle and is a more appropriate match with the service requirements at the park.[5]

There is no benefit from medium- or heavy-duty platforms when utilization of the design-life of the vehicle cannot be realized. Even a light-duty platform, will likely age out before the drivetrain reaches its end of life.

Lower maintenance costs, greater serviceability

A light-duty "truck" chassis and drivetrain is serviceable by almost any certified mechanic familiar with domestic work trucks and will share a plethora of parts with their mass produced counterparts.

A domestic "truck" based chassis and drivetrain will have lower repair costs, greater parts availability, and more flexibility with maintenance, service, and repair providers.

Enhanced accessibility without a premium price

"Cutaway" style shuttle buses are only available as low-floor variants in medium- and heavy-duty platforms, both of which are roughly double the cost of a high-floor counterpart. [6]

The trolley-on-truck has a low-floor configuration available which enables the accessibility benefits of a low-floor vehicle at the price point of a light-duty shuttle bus.

Market research performed by the Volpe Center determined that Hometown Trolley offers the only carriage-style trolley vehicle produced on a domestic truck chassis, described in Table 1 as "trolley-on-truck." An Altoona tested 7-year / 200,000 mile small trolley called The Carriage (Figure 6) is available in multiple fuel options and with a Braun or Ricon fold-out ADA ramp, various restraint options, and flip-seat options to accommodate preferred seating arrangements. Hometown Trolley estimated The Carriage with popular options would cost around $145,000-$155,000.

[4] The current fleet is comprised of three vehicles; however, one vehicle is kept as a spare and only two vehicles are routinely used with only one being in active service at any given time.

[5] The design life is typically calculated in miles put on the drivetrain and converted to years based on the fleet's typical annual mileage, which for medium-duty vehicles far exceed the annual mileage accrued by Adams NHP's vehicles. It is also important to note that putting half as many miles on the vehicle annually does not double the vehicle life.

[6] Shuttle-buses available for purchase through the GSA.

Figure 6
Hometown Trolley – The Carriage
Source: http://hometowntrolley.com/

Business Models

There are four primary components to the Adams NHP shuttle service: vehicle ownership, vehicle maintenance (daily checks, preventative maintenance, and heavy maintenance and repair), vehicle storage, and operation of the vehicle. Since Adams NHP purchased their current fleet, a single service contract has been used to cover vehicle maintenance, summer vehicle storage, and operation of the system. Having a contract for operations and maintenance has allowed Adams NHP to have minimal involvement in the service operations. Vehicles are stored off-site, refueled, inspected, maintained, and driven by the contractor, with the park involved with ticket sales, oversight of the contract, and winter storage of the vehicles. While this model reduces the need for Adams NHP staff to be actively involved with shuttle operations, some concerns have been raised as to whether the current contract is as cost effective as it could be. NPS only received one bid in response to the last RFP for contracting services and the maintenance costs for the current contract are much higher than would be expected given the vehicles modest use and low mileage accrual.[7]

In order to analyze potential cost savings, options for handling the primary service requirements are described below and the business models for managing these components are explored.

[7] Questions arise as to how the singular bid with high maintenance costs has occurred, including:

- Is it the type of contract that is being put out to bid? Fixed Price vs. Cost Plus? Does having a single contract for service and maintenance limit the pool of bidders? Does the current fleet of vehicles "scare" potential bidders away?
- Is it lack of outreach to potential bidders who therefore do not know that the contract is available to bid on? Is the length of the contract too long/short?

Vehicle Ownership

There are three options for vehicle ownership. Adams NHP may purchase vehicles (current vehicles are purchased) to operate the Adams NHP tour, elect to have vehicles provided by a service provider as part of an operations contract, or pursue leasing vehicles from the organization providing operations support.

Traditional leasing of vehicles is often difficult to accomplish as GSA fleet lease vehicles are built to a common specification and may not provide all features required by Adams NHP. This is particularly true if use of a specialty vehicle, such as a trolley, is desired. In the past when lease options have been explored by the Volpe Center project team on behalf of other public lands, GSA has not been able to accommodate the request and indicated that vehicle availability is not guaranteed. Other companies may advertise the ability to lease vehicles, but prior Volpe Center experience has shown that the type of vehicle often desired to meet public lands transportation needs are not the types of vehicles available for lease. This is especially true if the park is looking for a unique vehicle.

A handful of private bus leasing companies exist across the country and the project team has listed a few in Appendix A that may be worth considering for the Adams NHP service. In general, lease fleets are ordered in large quantities and may have limited ability to customize the vehicle for a given lessee's needs.

Adams NHP previously utilized contractor-owned vehicles to provide their service, but desired a unique vehicle that offered park-specific branding and an image that provided separation from other vehicles operating in and around Quincy. An approach requiring the vehicles be provided under contract to operate could result in reduced competition for the contract, particularly if the contract operators' fleet are not compatible with the parks' needs or regulatory requirements (such as ADA accessibility for all vehicles, etc.). A contractor who is required to purchase a vehicle outside their standard fleet to meet the parks needs is likely to add a premium to the cost of the vehicle, which would be seen by the park in increased contractual costs.

Vehicle Maintenance

Daily Checks

The day-to-day operations of the vehicles must include daily checks and cleaning, which can be performed by drivers or mechanics. The daily vehicle checks should include:

- doors open/close properly;
- windows, wiper systems, and HVAC systems function properly;
- signage (if applicable) functions properly;
- wheelchair lift system operates properly;
- tire pressures checked (visually or with a tire pressure gauge); and
- fuel level is sufficient for the day's use.

The status of each item reviewed on the daily checks should be documented and made immediately available to maintenance personnel if issues are identified. Whether drivers or mechanics perform these checks can depend on how the operation is structured and whether the vehicles are stored at the maintenance facility, on-site, or at a dedicated storage location.

Preventative Maintenance

Preventative Maintenance (PM) is maintenance performed on-schedule, ideally prior to any sort of mechanical failure. Manufacturers outline recommended maintenance schedules for their vehicles. Ford recommends their basic maintenance to be carried out at 7,500 miles on their light-duty truck platforms. PM may include items such as:

- changing engine and transmission oil;
- changing filters for oil, fuel, and air;
- replacing brake pads and rotors;
- rotating or replacing tires;
- inspection and lubrication of chassis and drivetrain components;
- checking battery health;
- changing wiper blades; and
- other various wear items that need regular replacement.

These tasks must be performed by a general mechanic and often require access to suitable lifts and professional tools, including diagnostic software and specialty tools that may be required for servicing certain vehicle components. A robust and proactive approach to PM has been shown to reduce long-term operational costs, reduce mechanical break downs or failures requiring road-calls or extensive repairs, and aids in ensuring that the vehicles used to transport visitors are clean, safe, and mechanically sound.

The vehicles at Adams NHP accumulate relatively low annual mileage and PM could be accomplished by a pre-season "spring" service when the vehicles are taken out of winter storage and a post-season "fall" service when the vehicles are prepped for winter storage. Engine oil and filter replacements have the shortest mileage intervals at 7,500 miles which exceeds the mileage accrued by each vehicle during the season. There are no other PM-related items requiring shorter maintenance intervals.

Heavy Maintenance & Repair

Heavy Maintenance and Repair (HMR) generally requires a vehicle to be removed from service and may include significant scheduled maintenance (such as an engine or transmission rebuild, suspension overhauls, and brake relining) or unscheduled maintenance. Significant HMR activities involves the vehicle being on the lift and worked on for multiple days. This may be due to either lengthy procedures (removing several components or systems to access the failed part or system) or having to wait for parts that are not usually stocked. While scheduled HMR based can be scheduled for the off-season, unscheduled HMR occurs more frequently on older, higher-mileage vehicles; new vehicles may also experience failures that can cause lengthy down-time to either perform the repair or to wait for parts. HMR activities require professional mechanics, tools, and vehicle lift equipment and should be performed by a certified and/or factory trained mechanic. Unscheduled maintenance is the primary reason for having an additional vehicle in the fleet that is above and beyond the number of vehicles needed to provide peak season service.

HMR activities could benefit from being performed under a maintenance contract, which would facilitate repairs being made in a more timely fashion. It is commonplace for even those entities that perform their own PM to transport the vehicles to another facility to receive HMR. Depending on local resources, contracting to include HMR or seeking out HMR-related services when needed are both viable options to consider.

Vehicle Storage

The current contractor stores the Adams NHP trolleys inside during the season. Off season, the trolleys are stored at the park and covered. While the trolleys are stored outside at the park in the off-season, the park has been reluctant to store them at the park during the peak season. Indoor storage limits deterioration of the vehicles in general, including its body, paint, wheels, and tires. Outdoor storage of the vehicles during the season, when they are not prepped and wrapped or covered for storage, can accelerate the deterioration of exposed materials and result in increased maintenance costs.

Alternatives to having the contractor responsible for storing the vehicles could be Adams NHP finding indoor storage for the vehicles during the season. Some options that could be explored include:

- President's Place Parking Garage (adjacent to the Visitor Center, where visitors already get validated parking)
- The MBTA Quincy Center garage (Burgin Parkway, 1 block)
- The MBTA Quincy Storage Yard (954 Hancock Street, 0.6 miles)
- The City of Quincy Public Works (55 Sea Street, 0.7 miles)

One consideration regarding vehicle storage locations is that the closer to the park, the less time is spent paying a driver to reach the park. While the MBTA may be willing to consider shared use of their facilities, it is unlikely due to 1) security concerns at the storage yard and 2) high demand for parking at the Quincy Center garage.[8]

Vehicle Operations

Operation of the service requires having a driver licensed to drive the vehicle (Commercial Driver's License (CDL) for more than 15 passengers); familiarity with the route and schedule; and upfront expectations of the driver (i.e. is the driver required to provide interpretation and/or use specific equipment such as audio/visual equipment?). Operation may also include transporting the vehicle from where it is stored to the route and refueling the vehicle.

Current operations call for nine hours of service per day with the expectation that tours start every half hour. While there is no restriction limiting a single driver to covering a full nine-hour day, service every half hour requires the driver to constantly be in motion without the opportunity for breaks. This is one of the reasons the current contractor has broken the day into two shifts. It is the responsibility of the contractor to hire drivers and arrange an appropriate driver schedule to make sure all trips during the service hours can be provided.[9]

Refueling (or charging) the vehicle as needed may be considered as part of the daily check activities or part of operations, depending the arrangements that are set up for operating. Since the park does not have on-site refueling, it is likely that it would need find a fueling service elsewhere. Some contracted operators may have their own refueling facility or an agreement could be setup to use a commercial gas station. A fueling location in close proximity to the route and/or storage facility is ideal.

Business Model Options

As discussed earlier, the desire for Adams NHP to have a unique vehicle makes it challenging to find a cost effective way to consider vehicles leased or owned by someone outside of the park itself. The business model options discussed below and summarized in Table 2 focus on options where the park continues to own the vehicles. If the park were to determine that the type of vehicle used for the service was not important (beyond the requirements for ADA accessibility), alternative ways to acquire the vehicle could also be integrated into various business models.

Single-Contract/Current Model

Under the single-contract model, all operations and responsibilities will remain as is. The park could pursue efforts to foster greater competition for a combined operations and maintenance contract upon

[8] The Quincy Center Garage is expected to be under construction in the short-term.

[9] A strict schedule could be developed with some (but not all) hours having two trips that would allow one driver to cover the entire day and have breaks, presuming a nine-hour work day was allowed by the employer. This could possibly be more attractive to NPS or smaller contractors. One consequence of a strict schedule is that the park would not have the flexibility it has now to add additional second trips per hour.

expiration of their current contract. At least two additional local vendors contacted expressed an ability to perform this type of work and an interest in bidding on this type of work (Appendix A).

> **Pros:** Vehicle ownership and contract oversight are the only responsibilities of the park.
> **Cons:** Limited competition and high-cost.

Multi-Contract Model

Under this model the park would contract operation of the service and, if desired, storage of the vehicles separately from the maintenance of the vehicles. Storage of the vehicles during the season could be included in the operating contract, or the vehicles could be stored outside and on-site. As discussed earlier, if stored on-site, either NPS staff or the contracted drivers could be made responsible for daily checks. By separating operations from maintenance, the park may gain transparency in actual costs. Potential cost savings would likely come from more competition for a maintenance-only contract or the ability to set it up as a cost plus contract, where the contractor is paid for allowable expenses plus additional payment for profit. The park would be responsible for greater administrative oversight of multiple contracts. Adams NHP would also need to more closely track potential maintenance and ensure that a replacement vehicle could be quickly made available if the one in operation becomes disabled. Conceptually this model may suffer from some loss of economy of scale in terms of one contractor being able to spread the administrative expense and profit over both components of a larger overall contract.[10]

> **Pros:** Potential cost savings and flexibility to separate as much operations as desired.
> **Cons:** Greater oversight and administration of multiple contracts required by park. Vehicles are stored on-site, but outside and exposed to weather.

Lean Model

Under this model, the park would continue to own their vehicles and would assume responsibility for operating the service, including conducting daily checks and refueling when needed. This would require the park to hire staff with CDLs to operate the shuttle.[11] The park would pursue a maintenance contract for both PM and HMR with a local maintenance service provider and would park and store the trolleys on-site, year-round.

> **Pros:** Further potential for cost savings.
> **Cons:** Greater park responsibility, requires staff with a CDL, and requires vehicles to be stored on-site, but outside and exposed to more weather conditions unless other storage options can be identified.

Park Intensive Model

Under this model, the park would continue to own their vehicles but would assume responsibility for performing daily checks and PM as well as operating the service. This model would also require the park to hire staff with CDLs to operate the vehicles presuming they have more than 15 passenger seats. The park would perform maintenance on-site or take their vehicles to a local maintenance service provider to perform PM and HMR on an as-needed basis. This model has the same features as the Lean Model with the addition of the park providing preventative maintenance instead of a contractor.

> **Pros:** Lowest operational costs.

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[10] Although this is not necessarily the case with the current single-contract.

[11] If it were determined to eliminate double tours, the light-duty vehicles could be reconfigured to have 15 passenger seats plus the driver and could then be driven by NPS staff without a CDL.

Cons: Greatest park responsibility including having drivers and staff to perform daily checks, refueling, and preventative maintenance. Vehicles are stored on-site, but outside and exposed to weather.

Table 2
Light-Duty Shuttle Buses Available via GSA
Source: GSA

Contract Options	Single Contract	Multi-Contract	Lean	Park Intensive
Vehicle Ownership	NPS	NPS	NPS	NPS
Maintenance: Daily Checks	Contractor 1	Contractor 1	NPS	NPS
Maintenance: Preventative	Contractor 1	Contractor 2	Contractor 1	NPS
Maintenance: Heavy Duty & Repair	Contractor 1	Contractor 2	Contractor 1	Contractor 1
Vehicle Storage	Contractor 1	NPS or Contractor 1	NPS	NPS
Operations	Contractor 1	Contractor 1	NPS	NPS
Fueling	Contractor 1	Contractor 1	NPS	NPS

Business Model Recommendations

With each of the different business models, Adams NHP takes on varying levels of responsibility. Based on discussions with the park and the challenges that they have had in recent years hiring seasonal workers in a timely fashion, using a contract for operations may be the soundest option. The Volpe Center project team recommends identifying the desired vehicle and then having further discussions with potential service providers to better understand the potential market. Items to further research include:

- Implications on costs and competition of having a single contract vs. multi-contract model.
- Contractors ability to bid on cost-plus vs. fixed price contracts.

Volpe Center believes that with a light-duty vehicle maintenance needs should be relatively limited and simple at least during the first 3-5 years of the new vehicle's life. Adams NHP may want to consider whether the contracts they currently have to support their non-shuttle vehicle fleet may be used to support some of the components of service provision such as refueling and maintenance. Regardless of the contract options chosen, it is recommended that effort be put into outreach to potential bidders to maximize competition.

Appendix A

Potential bus leasing companies:
TESCO Bus - http://tescobus.com/services/leasing.html
National Bus Sales - http://www.nationalbus.com
Davey Coach - http://www.daveycoach.com/

Summary of potential operations service providers as of 2/2017.

Current provider:
Brush Hill Tours
http://www.brushhilltours.com/

Other providers contacted:
A&A Metro Transportation
http://www.aametro.com/
Bridgewater, MA
Joe McCallum
Example services: Tufts University shuttle, Blue Cross Blue Shield Employee shuttle

East Coast Transit Service
Michael Blondon
508-638-5985
Example services: Brockton Area Transit Service provider

Dattco
Randolph, MA
Tom Bascetta
860-250-6780

Also reached out to **Academy Bus Boston**, but they only use an "own, operate, maintain model" and their current fleet is all coaches.

The Massachusetts Bay Transportation Authority is the multi-modal transportation provider in the Greater Boston Metropolitan Area and provides public bus service in Quincy. Typically, local transit agencies are restricted from operating chartered services, such as the Adams NHP shuttle under the Federal Transit Administration Charter Service Regulations (49 CFR Part 604), which aim to limit federally subsidized agencies from unfairly competing with privately owned companies. There is an exception for official government business, but since more than 80 hours of service are required, an effort to identify a suitable private company would need to be documented. (Section 604.6)

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14. ABSTRACT

Adams NHP owns three trolley vehicles that were purchased in the early 2000s and, while their accrued mileage remains low, they have reached the end of their useful lives due in large part to vehicle parts becoming unavailable. Both the original trolley vehicle manufacturer as well as the wheelchair lift manufacturer have since gone out of business. Based on information gathered on the existing conditions of the shuttle service and park visitation, several vehicle options and business models were considered. The final recommendations call for a smaller trolley-type vehicle fleet that has more universal components, as well as suggestions for changing the operational business model for the service.

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National Park Service, NPS, Adams National Historical Park, Transit, Shuttle, Accessibility

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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.

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