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Salem Maritime National Historic Site
Salem, Massachusetts



Salem Maritime National Historic Site

Transportation Needs Assessment



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John A. Volpe National Transportation Systems Center



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Report notes

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1 Introduction

Salem Maritime National Historic Site (SAMA) is set within a dense urban environment in a city that offers many historic and cultural attractions. The historic site consists of an orientation center, several 16th and 17th century homes and structures, three wharves, and a replica tallship. Key transportation challenges for SAMA, identified in a previous report of existing conditions, are to provide access between existing sites, provide water-based access consistent with the park's management goals, and provide traveler information to visitors. Based upon site visits, research, and meetings and interviews with SAMA staff and public and private sector stakeholders, the report of existing conditions resulted in the identification of the following transportation needs:

- Visitor transportation survey;
- Pedestrian circulation plan;
- Pilot ferry shuttle service to Baker's Island;
- Salem Sound water transportation study;
- Traveler information improvements; and
- Employee and equipment parking improvements.

Addressing these transportation needs will guide SAMA's transportation planning process in the near future and also in the long term as it embarks on its planning process for revising its General Management Plan (GMP).

2 Transportation Needs

2.1 *Visitor Transportation Survey*

A visitor transportation survey can provide valuable information as to how the current transportation system shapes the visitor experience and how a future transportation system may provide access and circulation to the public. SAMA's Site Plan was completed in 1990, and both the built environment and the ways in which visitors access and consume information have changed drastically since that time. SAMA needs a visitor transportation survey to obtain actual and stated preferences regarding mode choice, traveler information, visitor interests and use, and willingness to pay. The survey will provide additional basic information that will greatly improve the quality of the additional efforts suggested by this needs assessment. Furthermore, the visitor survey will inform development of the transportation component of the pending GMP update.

2.2 *Pedestrian circulation plan*

Because NPS operates multiple properties in this urban environment, visitors tend to walk among park sites, city attractions, and transportation hubs. Thus the pedestrian experience is key to visitors' experience of SAMA. Meetings with SAMA and stakeholders raised several important pedestrian access issues.

Visitor confusion among sites

Several Salem studies have observed that many visitors are unaware of SAMA prior to their visit. Though the city and the park have recently implemented the first phase of a signage plan that has installed many signs with NPS "arrowheads", these signs lead automobile visitors to the Regional Visitor Center (which is also operated by NPS). The park has noted that many visitors who enter the Regional Visitor Center either fail to learn about the existence of SAMA or think the Regional Visitor Center actually is SAMA. Though they may walk to many other attractions once in Salem, they may not ever visit SAMA.

Visitor/pedestrian-friendliness

Several transportation hubs in Salem, particularly the main parking garage and the commuter rail station, have been noted by park stakeholders as being unintuitive, uninviting, and confusing to navigate. For example, stakeholders report that the interior of the main parking garage is difficult for pedestrians to navigate, does not contain enough signs, feels unsafe, and does not adequately point pedestrians to other places of interest in Salem. The commuter rail station does not properly orient visitors arriving by train.

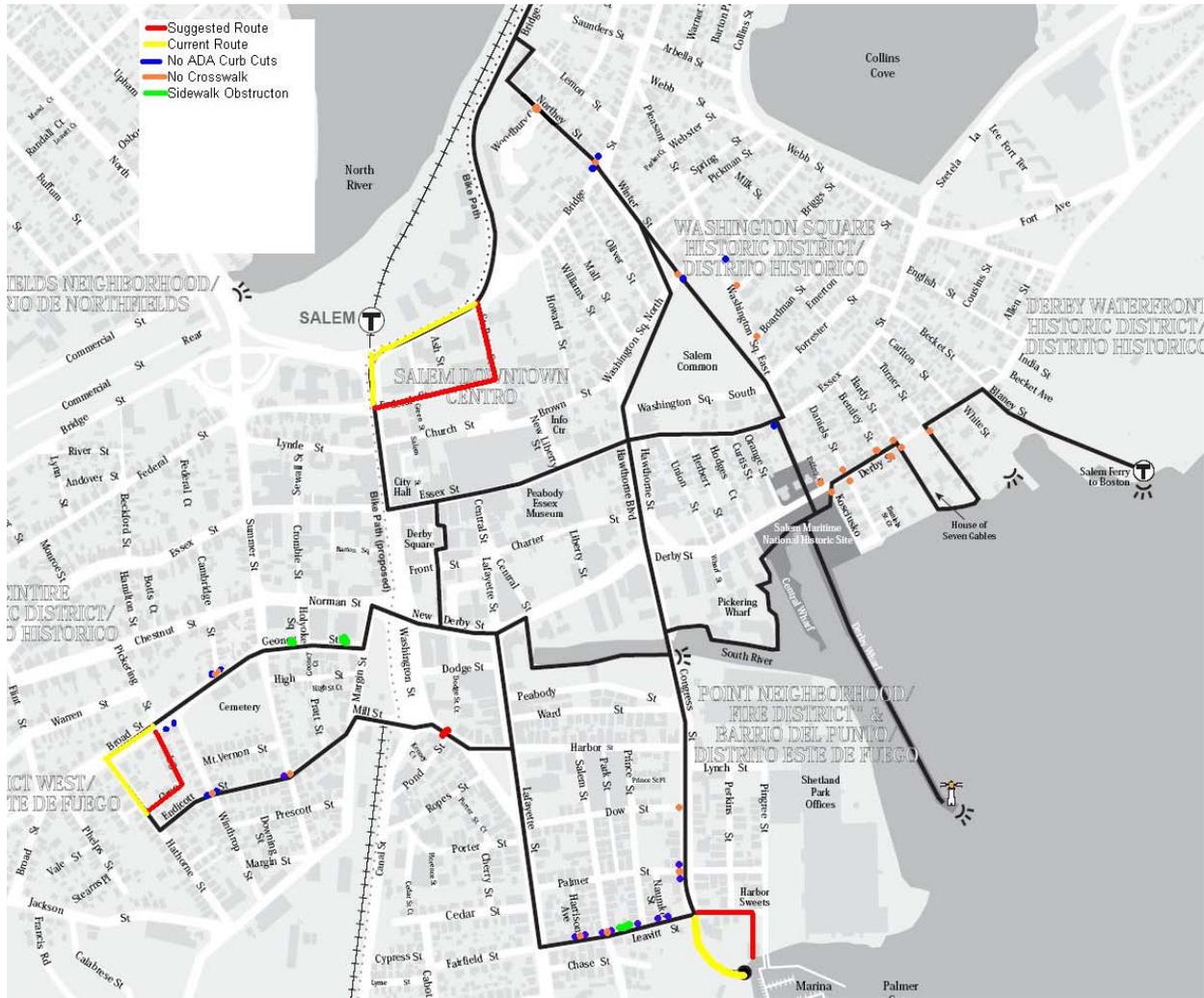
Inadequate signage and wayfinding

Despite several attempts by the city and other organizations in Salem to address visitor wayfinding, signage and wayfinding issues persist. Issues include an overabundance of confusing public and private signs throughout the city and lack of key signs in particular areas. NPS does not have a paper map to guide visitors arriving by train at the commuter rail station, by ferry at the Blaney Street Wharf, or by private automobile at one of many parking garages, parking lots, or street parking spots.

Inadequate physical infrastructure

SAMA staff members have reported the existence of deteriorated or inaccessible pedestrian infrastructure. The city has documented some but not all inadequate infrastructure, shown in Figure 1. Park visitors rely on pedestrian infrastructure to travel the Regional Visitor Center, SAMA, and transportation hubs.

Figure 1
Salem pedestrian infrastructure partial needs assessment
 Source: City of Salem



A pedestrian circulation study is necessary to address these issues. The study should formulate a vision for pedestrian circulation among National Park Service (NPS) sites including the Regional Visitor Center, SAMA, and transportation infrastructure in Salem including parking garages, parking lots, the ferry terminal at Blaney Street Wharf, and the commuter rail station. The study should address the following questions:

- What is the preferred pedestrian experience?
- Where does the preferred pedestrian experience start/end?
- Where should visitors begin their visit?
- What sites should be recommended for visitors to see?
- What routes should pedestrians travel among destinations?
- What should pedestrians see along the routes?
- Where are pedestrians having problems, either conceptually or physically?

- Are there problematic intersections?
- Is there deficient infrastructure?
- Are there places that are inadequately signed?

The pedestrian circulation study should rely heavily on guidance and recommendations from Salem’s current parking study, Salem’s recent signage and wayfinding plan, the park’s past and current GMP updates, and input from stakeholders including city of Salem and Essex National Heritage Commission.

The circulation study would consist of four tasks:

- 1) Formulation of pedestrian vision and goals and creation of a vision of the ideal visitor experience at the park.
- 2) Documentation of pedestrian origins, destinations, and existing routes, and proposing new routes if necessary.
- 3) Analysis of existing and proposed routes, including documentation of interpretive, cultural, and economic opportunities along each route, and evaluation of the routes based on the following criteria:
 - a) Signage and wayfinding. The study should examine existing methods of orienting visitors with respect to location and direction and existing signs that provide information about location of destinations, distance, directions. For preferred pedestrian routes identified, the study will make suggestions related to these aspects of signage and wayfinding.
 - b) Accessibility. The study should address the capability of various routes to provide access among origins and destinations. Factors considered will include route convenience, route directness, existence of barriers, sidewalk materials, walking travel time, and existence of infrastructure to accommodate disabled travelers.
 - c) Comfort and walking pleasure. The study should address comfort and entertainment values of various routes. Factors considered will include existence and diversity of opportunities along the route, quality of opportunities along the route, and buffers between the route and the road.
 - d) Safety. The study should address the safety of various pedestrian routes. Factors considered will include travel speeds of roads, lighting issues, number of people on the walkway, number of crossings (both signalized and non-signalized), and width of sidewalks.
 - e) Preferred routes. The study will propose at least one preferred route between each origin and destination pair and will include a list of suggested improvements for each.
- 4) Creation of a marketing plan for the preferred pedestrian routes and identification of materials and methods used to disseminate pedestrian traveler information to current and future SAMA visitors.

2.3 Pilot ferry shuttle to Baker’s Island

In 2005, the U.S. Coast Guard and Department of Interior agreed to transfer a portion of Baker’s Island and associated structures, including a light station, to the Essex National Heritage Commission (ENHC), in part because ENHC and SAMA agreed to provide public access to the site. Transfer of the property occurred in 2009, and providing public access to Baker’s Island is an obligation of NHS and the ENHC. A pilot ferry service to the island would both provide access and afford SAMA a means of collecting actual operations and maintenance data and assessing visitor demand and willingness to pay for local water transportation in Salem Sound. If the service is successful enough to continue, this information will assist future decision making regarding operations, interpretation, pricing, and marketing.

The service needs and operating model developed collaboratively by SAMA staff and the Volpe Center are as follows:

- SAMA would purchase, operate, and maintain a passenger boat (having capacity for 18 passengers, a captain, and an NPS ranger) to provide public transportation and field trip excursions to Baker’s Island. The one-way distance between SAMA and Bakers Island is 4.3 nautical miles, and the required one-way trip time will be approximately 30 minutes.
- The service’s landings would be at Central Wharf in SAMA and on the pebble beach at Bakers Island, where there is a tidal range approaching 12 feet.
- Scheduled trips would include an educational program that interprets the history and culture of maritime traditions and life at sea and environmental themes of Salem and Salem Sound. Visitors’ activities on Baker’s Island would be ranger-led to ease concerns of neighboring residents. There will likely be additional, similar trips for school groups and other organizations such as historical societies and lighthouse aficionados.
- Required passenger capacity is 18 persons, not including a captain and a NPS ranger, which will necessitate a U.S. Coast Guard Certificate of Inspection. This passenger capacity is suitable for the small group tours that SAMA/ENHC plans to conduct on the island.
- The ferry service will make two daily round trips on weekends and holidays from Memorial Day through Independence Day. From Independence Day through the first weekend in September, the service will make two daily roundtrips on weekends and holidays and one daily roundtrip on weekdays. From the first weekend in September through October, the service will make two daily roundtrips on weekends and holidays. Assuming up to ten trips may be cancelled due to inclement weather, the service is expected to run 133 trips per season.
- Passengers will be charged fares of \$15 per adult and \$8 for children under six and seniors.
- The boat would likely also have additional uses by SAMA:
 - Site maintenance activities and transport of materials to Baker’s Island
 - “Push boat” for assisting the handling of the replica tall ship “Friendship”.
- The boat would be hauled out and stored on its trailer during winter months. The City of Salem has pledged to store the boat in the sea-plane hangar at Winter Island.

Some particulars of the candidate boat for this service are driven by the landing conditions at Central Wharf in SAMA and on the pebble beach at Baker’s Island, where there is a tidal range of approximately 12 feet. The boat would have design features for beach landings, including robust bottom structure and plating, and a bow ramp that folds down to provide easy ingress/egress directly onto land. The Thatcher Island Association operates similar vessel to Thatcher Island (Rockport, Massachusetts) during July and August. Physical requirements of the boat are as follows:

- A catamaran hull to provide the required lateral stability for a passenger boat of this capacity;
- A hand-crank operated bow door to facilitate landings on a pebble beach;
- Port and starboard side boarding doors to facilitate boarding at a floating pier;
- Dual outboard marine engines;
- “Push knees” to allow the vessel to be a “push boat” for the park’s replica tall ship;
- Navigation system including radar, GPS, and depthfinder;
- Folding bench seating for passenger seating; and

- A U.S. Coast Guard Certificate of Inspection confirming appropriate design and construction and provision of all navigation, communication, and life safety equipment required for a passenger boat of this size and capacity.

Market research revealed a GSA-approved vendor, the Munson Company in Burlington, Washington, that manufactures “Packcat Landing Craft”. Munson’s 32-foot long, 12-foot wide boat can be fitted with bench seating to accommodate 18 passengers and a “bimini” top for protection from the weather, and its deck space can accommodate stores and materials for maintenance and repair. A similar “Packman” vessel is shown in Figure 2 (“Packcat” has a catamaran hull while a “Packman” has a mono hull).

Figure 2
Munson 32' by 12' aluminum landing craft

Source: William E. Munson Company



A Volpe Center ferry operations cost model was used to estimate costs and break-even patronage and revenue of the pilot service, and the results are summarized in Table 1. Assumptions and conditions are as follows:

- The boat would be acquired through a Paul S. Sarbanes Transit in Parks program implementation grant. NPS would not be responsible for capital costs or debt service.
- The route is 4.3 nautical miles each way, at 15 knots operating speed.
- The boat will include twin 150 horsepower engines.
- The crew costs calculated for one Captain at a loaded hourly cost of \$31.50 and an NPS ranger at an hourly cost of \$23.00, per NPS guidance.
- Gasoline fuel costs \$3 per gallon and marine lubricant costs \$30 per gallon.
- General and administrative costs are estimated to be five percent of total annual revenue.

- Advertising and publicity costs are estimated to be five percent of total annual revenue, assuming ENHC can provide a matching subsidy.
- The purchase price for the boat is assumed to be covered by grant money, thus no debt service is considered.
- Protection and indemnity insurance is not required for NPS.¹

Table 1
Summary of SAMA – Baker’s Island Pilot Ferry Service

Source: Volpe Center

Pilot ferry shuttle characteristic	Model estimate
Principal dimensions	32' long x 12' beam, with bow ramp
Passenger capacity	18 persons
Power (assumed)	150 horsepower twin outboard
Service speed	15 knots
One-way trip time	30 minutes
Total round trips	133 trips
Total operating time	136 hours
Crew	2
Boat purchase price (including 175-hp outboard engine, rigging and fittings, and trailer ²)	\$250,000
Consumables (fuel, lubricant)	\$4,100
Labor, boat crews	798 hours; \$17,781
Vessel maintenance	\$5,841
Protection and indemnity insurance	\$0
Capital debt service	\$0
Total operating cost (season)	\$27,718
Operating cost per hour	\$204

Seasonal operating cost³ is estimated at \$27,718. If each adult is charged \$15 (estimated to account for 66 percent of riders) and each child and senior is charged \$8 (estimated to account for 34 percent of riders) for a roundtrip ticket (and five percent of each ticket goes towards marketing, publicity, and ticket administration), 2,184 passengers out of a maximum 2,394, or an average of 16.5 passengers out of a maximum 18 per trip, are required to break even on operations and maintenance costs.

Although achieving a breakeven ridership of 91 percent seems unrealistic, the scale of annual operations is relatively small, and minor shortfalls may be able to be covered by SAMA’s operating budget or other NPS transportation funds. For example, if the service were only to achieve 50 percent capacity, or nine riders per trip, the operating shortfall would be approximately \$13,000. Operating shortfalls and associated subsidies, though not encouraged, are common among public transit systems, and financial calculations alone do not consider the value of the use and positive experiences generated among visitors to the national parks.

Thus ferry service to Baker’s Island both fulfills the obligation of the U.S. Coast Guard and the Department of Interior to provide ferry shuttle service to Baker’s Island and complements management goals at SAMA by expanding interpretive programming onto the water. These goals may be further

¹ Telephone conversation with Department of Interior attorney Tony Conte, June 24, 2010.

² Volpe Center correspondence with Bill Munson, William E. Munson Co., June 2010.

³ Seasonal operating cost would not including debt service if capital costs of the marine craft are covered by Federal Lands Highway Program NPS Category III funds or by Federal Transit Administration’s Transit in Parks (TRIP) program.

addressed by additional water transport options to be examined in a “Salem Sound water transportation study.”

2.4 *Salem Sound water transportation study*

Two of SAMA’s interpretive themes described in the 1990 Site Plan are “Maritime Trade” and “Vessels and Life at Sea.” Although SAMA attractions include historic wharves and a replica tall-ship, the park in the past has concentrated on the landward residences, commercial structures, and government buildings that occupy the site north of Derby Street. Park visitors currently have limited opportunities for interpretative experiences relating to the sea and no opportunities for transport over the water in the context of the park’s program.

Thus a major goal of SAMA management is to develop programs to get people out onto the water, not only take people from “A to B”, but also to create educational and interpretive opportunities.

Two concepts require additional study. The first is a water taxi service in Salem Harbor for which candidate stops would include: Salem Willows; Winter Island; Blaney Street Wharf; SAMA; Pickering Wharf; South River Basin; and Forest River Park and Pioneer Village. The City of Salem has also expressed interest in a potential water taxi service⁴ and could be approached as a partner both in planning and implementation. The second concept is a “triangular” service that would ferry residents and tourists among the cities of Salem, Beverly, and Marblehead.

The water transportation planning study would explore and analyze the following components of the above two concepts:

- Results of the Bakers Island pilot ferry service including ridership patterns, participant feedback, and benefits and costs;
- Visitor interest in accessing various activity sites in Salem Harbor and Salem Sound and demand for water transportation to those sites;
- Inventory of existing maritime infrastructure at activity sites;
- Integration with existing transportation services including train, bus, bicycle, and ferry service to Baker’s Island;
- Creation and analysis of alternative operational concepts including ownership and operational structure, required vessels, scheduling, programming, and costs and benefits.

If the water transportation study finds opportunities for one or both concepts, next steps include detailed infrastructure and site assessments and pilot programs.

2.5 *Traveler information website improvements*

SAMA can improve the quality of transportation-related information on its website. First, in the section where it describes driving directions and parking, the website should include a driving map displaying major roads, important landmarks, parking lots and garages, and other NPS attractions such as the Regional Visitor Center. Second, the SAMA website should contain information about and hyperlinks to the immediate transportation services in Salem, namely the trolley service. Third, the website should provide additional material related to the relationship of the Regional Visitor Center to SAMA. Currently, the SAMA website provides directions to the Orientation Center, yet all the roadside signage directs patrons to the Regional Visitor Center. This unexplained inconsistency may lead visitors to believe they have visited one when in reality they visited the other. Finally, the website contains several self-guided tours. Based on the results of the pedestrian circulation plan, the SAMA website should include a map of

⁴ City of Salem (2008). “Salem Harbor Plan”. The City of Salem, Massachusetts, Mayor Kimberley Driscoll.

preferred pedestrian paths among attractions such as the Regional Visitor Center, the SAMA site, and transportation hubs throughout the city.

2.6 Employee and equipment parking improvements

SAMA management has identified several challenges related to parking of staff and support vehicles, namely that staff experience parking shortages near the site and that onsite parking of large, bulky facilities vehicles detracts from the historical setting. While this is a transportation need of SAMA, the park can actively participate and take advantage of the citywide parking study currently under way. There may be opportunities for the city and the park to partner and provide employee and facility vehicle parking spaces in nearby city parking garages and lots.

3 Acknowledgments

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