

Liberty State Park Circulator

Cost-Benefit Analysis

EXECUTIVE SUMMARY

Prepared for:

City of Jersey City, New Jersey

in collaboration with



Prepared by:

Sam Schwartz Engineering, D.P.C.

in association with

Stump/Hausman Partnership



May 31, 2013

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This study was funded in part with federal funds from the North Jersey Transportation Planning Authority and a 20% local match provided by the City of Jersey City. Sam Schwartz Engineering was hired by the City of Jersey City to conduct the Liberty State Park Circulator Cost-Benefit Analysis.



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JERSEY CITY

DEPARTMENT OF HOUSING, ECONOMIC DEVELOPMENT & COMMERCE
DIVISION OF CITY PLANNING



ROBERT D. COTTER, PP, FAICP
PLANNING DIRECTOR

JERRAMIAH T. HEALY, MAYOR
CARL S. CZAPLICKI, DIRECTOR

May 31, 2013

Dear Friends,

Liberty State Park is a treasure to Jersey City, offering vast open space, recreational opportunities, and spectacular views, particularly of its namesake, the Statue of Liberty. Liberty State Park is home to many popular destinations including the Liberty Science Center, the historic Central Railroad of New Jersey Terminal, and the Interpretive Center. Each year, millions of people visit the park - the largest green space in Jersey City, the second most populous city in the state - making the park not just a local destination but one that attracts visitors from around the state, the country, and the world.

The findings of the Liberty State Park Circulator Cost-Benefit Analysis are an important first step in restoring transit service to destinations within Liberty State Park. While the park's vast size is an asset, it poses a challenge to visitors who cannot or choose not to drive to the park. A circulator would build on the City's public transportation network that currently serves the edges of the park and would allow visitors to explore the many destinations in the park without their cars. Not only is transit in the park good for the environment, it is a matter of equity. A circulator would make the park more accessible to the 40% of Jersey City households that do not have access to a vehicle.

The Liberty State Park Circulator Cost-Benefit Analysis explored potential options for transit service in the park. The study identified four feasible options for transit service, which were the result of an extensive effort to understand Liberty State Park's unique characteristics and the technical expertise of the consultant team - Sam Schwartz Engineering and Stump/Hausman. Furthermore, this study brought together various stakeholders who were integral in shaping the final report. The consultant team's innovative approach and the collaborative nature of the study process make the findings of this study a valuable guide for future efforts to bring transit back to Liberty State Park.

A handwritten signature in blue ink, reading "Robert D. Cotter".

Robert D. Cotter, PP, FAICP
Director

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1 INTRODUCTION

1.1 CONTEXT

Liberty State Park is the most visited park in the state of New Jersey and the second most visited state park in the nation. The park, deemed “New Jersey’s gift to the Nation,” opened in 1976 just in time for the United States bicentennial celebrations. Located in Jersey City, it is adjacent to the New York Harbor offering spectacular views of Ellis Island, the Statue of Liberty, and the skylines of Manhattan and Jersey City. Liberty State Park is by far the largest park in Jersey City covering approximately 1,200 acres with approximately 600 acres consisting of uplands (approximately 250 of these acres in the Interior Park area are closed to the public), open fields, forests, and wetlands with the remaining approximately 600 acres as open water on the Upper New York Bay/Hudson River. The park offers open space and unparalleled ecological and wildlife opportunities located in an urban setting. Within Liberty State Park are several popular destinations including Liberty Science Center, Central Railroad of New Jersey (CRRNJ) Terminal, and the Interpretive Center. Because of these unique characteristics, the park is visited by local residents, as well as tourists from New Jersey, across the country, and around the world.

Jersey City is the second most-populous city in the state and a regional employment center with a growing residential population. Increasing mass transit opportunities within the park would benefit residents and visitors alike. Over five million visitors make trips to Liberty State Park each year. Liberty State Park is a local, regional, national, and international destination with a ferry connection to the Statue of Liberty (designated National Monument and United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site) and Ellis Island. In 2005, approximately 20 percent of visitors to the Statue of Liberty and Ellis Island (roughly 600,000 people) arrived by ferry departing from Liberty State Park. The Liberty Science Center on the park’s western edge is a regional destination with approximately 700,000 annual visitors. The landmark CRRNJ Terminal located on Liberty State Park’s waterfront is another regional draw.

While the park’s waterfront location is an asset, it is also a challenge, since the park is situated on the periphery of Jersey City and not in the heart of the City. The park is surrounded by water on three sides, limiting access mainly to the western edge. The Liberty State Park station of the Hudson-Bergen Light Rail (HBLR) is located on the western edge of the park, along with a bus stop served by NJ TRANSIT bus route #6. On the park’s northern edge is a stop for Liberty Landing ferry service between Downtown Jersey City and Lower Manhattan. However, there is currently no regular public transportation service into or between destinations within Liberty State Park. Furthermore, the park’s large size means that the distance between many destinations within the park is beyond a reasonable walking distance, generally considered to be less than a half mile. A high percentage of Jersey City’s residents do not have access to a private automobile and rely on public transportation. Even for those with a vehicle, parking in the park is limited and not expected to increase.

Beginning in 2001, NJ TRANSIT operated a shuttle that connected the HBLR station and destinations in Liberty State Park. Due to budget constraints, it was discontinued in 2010. In 2010 and 2011, Hudson Transportation Management Association (TMA) operated a peak summer shuttle service. However, without a dedicated funding stream, the Hudson TMA discontinued shuttle service after the summer of 2011. In the summer of 2012, a private operator, Liberty Loops, provided a short-lived peak summer shuttle service in the park.

The purpose of the Liberty State Park Circulator Cost-Benefit Analysis is to understand the existing and future need for a circulator that serves destinations in and near Liberty State Park and develop

concepts for feasible transportation improvements that meet that need. Jersey City's current population is highly transit-dependent and is anticipated to remain transit-dependent as the City's population grows.

1.2 BACKGROUND

Throughout the 19th and early 20th centuries, the land which is now home to Liberty State Park was an industrial area that was the nexus of an expansive transportation network that moved both passengers and freight. The CRRNJ Terminal still stands today and is a major attraction on the northern end of what is now Liberty State Park. The CRRNJ transported over half of the immigrants who arrived via Ellis Island between 1892 and 1920 to their new homes throughout the United States.

As railroads were replaced by other means of transportation, and as industry moved out of Jersey City, the area declined. The CRRNJ went bankrupt in the early 1960s and ceased to operate passenger service to the terminal. Time took its toll as buildings on the site were left vacant and began to decay and people used the abandoned land as a dump site. Citizen activists led by Morris Pesin, Audrey Zapp, and Theodore Conrad spearheaded a grassroots campaign between 1958 and 1976 to win citizen and political support for establishing a park on the former railroad site. In 1964, President Lyndon Johnson declared Ellis Island a National Monument. He promised \$6 million to beautify not only Ellis Island, but also the area of Jersey City behind it that included the land of what would eventually become Liberty State Park. A year later, in 1965, the City of Jersey City gave the State of New Jersey 156 acres, and this land became the foundation of Liberty State Park. In 1976, New Jersey Governor Brendan Byrne pledged \$1.2 million to have Liberty State Park ready for the nation's bicentennial celebrations. Liberty State Park was officially dedicated on June 14, 1976. The site has been dramatically transformed from an industrial rail yard into open space using millions of cubic yards of clean top soil.

1.3 SCOPE OF WORK

The existing conditions were assessed to determine current baseline data including the multi-modal transportation network, parking, existing park attractions, and park visitation. The assessment also examined socio-economic data for the surrounding communities in Hudson County, environmental considerations, and best practices for transit circulators serving parks throughout the country. A detailed travel survey was used as input to the travel demand model for projecting future transit ridership potential for the park. The travel demand model was developed for this study to determine the current and future (2020 and 2035) transit markets for Liberty State Park and the surrounding area. The purpose and need for the Liberty State Park circulator was determined, which justified that the remainder of the study would be conducted.

Potential modes and corridors for service were considered based on analyses of activity centers within the park, ridership on the previous park circulator service, and other considerations that pertain to operating the service in a park environment. Initial screening and analysis led to the elimination of modes of transit that were judged to be inappropriate for the park setting and scale of service being considered. Modes of transit retained for further study, in combination with selected corridors for service, were further evaluated. Detailed descriptions were developed for the service options that were retained including service headways, routes/alignments, bus stop/station alignments, and number of vehicles in revenue service. For each service option, projected ridership, qualitative assessment of potential impacts within the park, and related benefits were evaluated. Capital cost estimates were developed for each service option including annual operating and maintenance costs. The estimated costs associated with each service option were compared to associated benefits and potential impacts. Strategies were evaluated for implementing the transit options that have been developed to serve

Liberty State Park. This included a review of potential funding sources, selection of a lead agency, and implementation timeframes based on likely funding sources available to cover capital and operating costs. During the course of the study, seven meetings were held with the Technical Advisory Committee (TAC) and two meetings were held with the public. A study-specific website was created and updated throughout the study to keep the public informed on study progress.

2 EXISTING CONDITIONS

2.1 CURRENT ACCESS AND CIRCULATION

Several modes of transportation provide access to the edge of Liberty State Park, including roadways, light rail, bus, ferry, and bicycle and pedestrian facilities, as shown in Figure ES-1. The primary regional vehicular access route to Liberty State Park is the Newark Bay Extension of the New Jersey Turnpike (I-78) at Interchange 14C. Alternately, local vehicular access is available via Johnston Avenue, Bayview Avenue and Linden Avenue East by way of Caven Point Road. The main entrances to the park are along Audrey Zapp Drive and Morris Pesin Drive. The Liberty State Park station of the HBLR is located at Communipaw and Johnston Avenues just outside the park. This station opened for service in the year 2000 and is served by both lines of the HBLR, the West Side-Tonnelle Avenue and 8th Street-Hoboken lines. Adjacent to this station is a large park and ride lot that includes approximately 1,300 spaces.

There are a total of approximately 3,100 parking spaces within Liberty State Park. There are nine lots of varying sizes spread throughout the park. The Marina lot, the Liberty Science Center Lot, and the Ferry Lot charge a \$7.00 fee; the Boat Launch Lot requires a permit; and all other lots throughout the park are free of charge. The CRRNJ Terminal Short-term lot has a strict limit of two hours. The Liberty State Park HBLR station park and ride lot just outside the park is sometimes used for overflow parking on weekends and for special events held at the park. The Ferry Lot and the Liberty Science Center Lot are the only lots operated by an outside vendor, Central Parking.

Jersey City has a robust bus network, and several of these buses serve areas close to the perimeter of Liberty State Park. Others connect with the HBLR line and facilitate access to the park via a transfer between systems. NJ TRANSIT #6 serves the HBLR Liberty State Park station on weekdays and connects to Journal Square. The #6 bus does not stop at the LSP HBLR station on the weekends.

Statue Cruises operates ferry service between Liberty State Park and Ellis and Liberty Islands throughout the year. The National Park Service provides this ferry service to serve visitors of the national monuments. All visitors to the Statue of Liberty and Ellis Island must use the ferry service from either Liberty State Park or Battery Park in Manhattan. Liberty Landing Ferry operates service between Liberty Landing Marina in the park, Warren Street in Downtown Jersey City, and the World Financial Center Terminal in Manhattan.

In addition to the City street network, pedestrian and bicycle access to the park is provided via the Hudson River Waterfront Walkway on its periphery. The pedestrian bridge at the end of Jersey Avenue crosses over the Mill Creek and connects to Phillip Drive in the park. Within the park, there is a recreational hiking and biking trail parallel to Freedom Way. The Liberty Walk, designed with decorative lampposts and pavers, spans the eastern and northern edges of the park, terminating at Liberty Landing Marina.

Figure ES-1
Liberty State Park Area Transportation Map



2.2 EXISTING PARK ATTRACTIONS

Liberty State Park is home to many interesting and varied destinations and provides visitors with a unique experience. Visitors go to Liberty State Park for its open space, amenities, and attractions. Many of these activities and attractions are identified in Figure ES-2 including Liberty Science Center, CRRNJ Terminal, Liberty and Ellis Islands, 9/11 Memorial, Grove of Remembrance, Liberty Landing Marina, Interpretive Center, and Caven Point Beach. Each year, 5 million people visit the attractions in Liberty State Park.

**Figure ES-2
Liberty State Park Activities and Attractions Map**



2.3 SURROUNDING COMMUNITY

Jersey City is the second most-populous City in New Jersey. It is a diverse, densely-populated, urban community with a robust mass transit network. In Hudson County, there is an average of less than one car per occupied housing unit. In particular, a high number of Jersey City residents do not own cars. Many of these transit-dependent residents can get to “the doorstep” of Liberty State Park by transit, using the HBLR, the local bus, or ferry to the edges of the park. However, it can be difficult for these visitors to access many of the park’s attractions due to the large size of the park.

2.4 BEST PRACTICES: PARK CIRCULATORS

Best practices of transit circulators serving national or state parks that could be analogous to Liberty State Park were researched to determine operating characteristics. Elements of the transit operations in several parks, including Lowell National Historic Park and Stone Mountain, were found to be relevant to Liberty State Park.

2.5 TRAVEL SURVEY

A detailed travel survey was undertaken (in English and Spanish) to better understand why people visit Liberty State Park, how they get there, how often they visit, and where they come from. The main reason for the survey was to collect data that would serve as input to the travel demand model used to project future transit ridership potential for the park. Generally, the surveying was conducted throughout the month of July 2012. Separate survey forms were developed to gather data from the various populations of people that use or could potentially use Liberty State Park.

The number of completed surveys was tabulated for each survey type. Overall, a total of 2,046 surveys were returned, including Liberty State Park Interview Surveys (733), Liberty Science Center Interview Surveys (738), On-line Surveys (for both visitors and potential visitors) (528), and Paper Surveys (for both visitors and potential visitors) (47). The Liberty State Park Interview Survey concluded that recreational trips were mostly from the local areas, visitors to Ellis and Liberty Islands mostly come from great distances (out of state and foreign), average length of stay was approximately three hours, the average group size was just over three people, and approximately two-thirds of respondents visit on a relatively infrequent basis. The Liberty Science Center Interview Survey concluded that a high number of visitors came from New York State, average length of stay was approximately four hours, average group size was close to four people, and most travel by car. The On-line Survey concluded that leisure was the most frequent purpose for visiting the park, more than half of respondents come from Jersey City, average group size was about two and a half people, almost half visit several times a year, and more than half travel by car.

3 FUTURE CONDITIONS

The NJ TRANSIT #305 circulator shuttle service connected the HBLR Liberty State Park station with major and minor destinations within Liberty State Park for more than ten years. Service was provided by NJ TRANSIT between 2000 and 2010 before it was discontinued in the spring of 2010 as part of state budget cuts. The Hudson TMA operated shuttle service during parts of 2010 and 2011. This service allowed visitors who walked into the park or arrived at the park via transit to more easily visit distant and multiple destinations throughout the 1,200 acre park.

One of the purposes of this study is to determine the current and future (2020 and 2035) transit markets for Liberty State Park and the surrounding area. Four potential primary markets for a new Liberty State Park circulator shuttle service were identified including: Regional Attractions Visitors, Local Recreational Visitors, Liberty Landing Ferry Commuters and Visitors, and Industrial Park Workers. Each of these markets has very different characteristics so the potential ridership for each of the markets needed to be determined separately.

Regional transportation models are tools that are frequently used to estimate ridership for proposed transit services. However, regional transportation models typically focus on the weekday commuter periods and the work trip. The large majority of Liberty State Park trips are recreational trips. Since work trips for both Jersey City residents and park workers represent only a small percentage of the potential transit market, the North Jersey Regional Transportation Model – Enhanced (NJRTM-E) could not be directly used for ridership forecasts. In addition, the home origin distribution and mode choice characteristics of each of the four markets noted above are unique. Therefore, it was not desirable to develop a single model for the “average” park visitor. Instead, separate models were developed for each of the four markets using available park visitor data as well as the data collected by surveys of park visitors conducted as part of this study.

All new models must be calibrated to reflect existing conditions before they can be applied to forecast future conditions. The most recent complete year of shuttle ridership was 2009 when approximately 60,000 visitors used the NJ TRANSIT #305 shuttle service. This ridership was used in the modeling process, and ridership characteristics were estimated based on the visitor survey data.

A key finding of the modeling process was that both the local recreational market and passengers of the Statue of Liberty / Ellis Island ferry service would be large components of the projected shuttle ridership. Liberty Science Center visitors comprise a smaller percentage of the ridership. Few ferry commuters and visitors and/or industrial park workers were identified in the survey. Potential ridership is forecast to grow by 40 percent by 2020 and more than double by 2035, largely driven by high growth in the number of transit-dependent, local recreational visitors.

Future year ridership for visitors of regional attractions was based on regional population growth. Local recreational ridership growth was based on specific residential developments within Jersey City, as well as municipal population growth for the remainder of Hudson County and Newark. Because the population of Jersey City in the vicinity of Liberty State Park is anticipated to grow at a much faster rate than the region as a whole, the local recreational visitor market is expected to grow much more rapidly than the regional visitor market in the future. Table ES-1 shows the existing demand and forecast shuttle ridership by market assuming a circulator service similar to the NJ TRANSIT #305 bus route with daily service from April to December and weekend and holiday service from January through March. Of course, ridership would vary depending on the specific type, routing, frequency of service, and span of service that would be provided.

Table ES-1
Liberty State Park Circulator Projected Shuttle Ridership

Market	2011		2020		2035	
Local Recreational	28,700	48%	50,900	60%	79,900	68%
Ferry Visitor	26,500	44%	28,300	34%	31,800	27%
Liberty Science Center Visitor	4,800	8%	5,100	6%	5,800	5%
Total	60,000	100%	84,300	100%	117,500	100%

4 PURPOSE AND NEED STATEMENT

4.1 PURPOSE OF LIBERTY STATE PARK CIRCULATOR

The purpose of the Liberty State Park Circulator is to provide a reliable transit service to, from and within the park that:

- Provides an alternative to reliance on the automobile for access to and within the park;
- Serves the current and estimated future transit demand to the park for recreational and tourist markets;
- Provides Jersey City residents who do not have access to a car with a means to visit the park.

4.2 GOALS AND OBJECTIVES

A number of goals and objectives were identified at the outset of this study by Jersey City, the consulting team, and stakeholders. A transit circulator would achieve many of these goals and objectives:

- Reduce auto travel to the park
- Capitalize on the multi-modal mass transit network to make the park more accessible
- Consider transportation needs of underserved communities
- Develop connectivity within Liberty State Park and consider destinations near the park
- Recognize Liberty State Park as a local and regional destination
- Support tourism
- Improve linkages to national monuments

5 OPTIONS FOR CIRCULATOR SERVICE

Potential modes and corridors for service were considered based on analyses of activity centers within the park, ridership on the previous park circulator service, and other considerations that pertain to operating the service in a park environment. Initial screening and analysis led to the elimination of modes of transit that are inappropriate for the park setting and scale of service being considered. Modes of transit retained for further study, in combination with selected corridors for service, resulted in four options advanced to the cost-benefit analysis phase of this project.

5.1 SERVICE CORRIDORS

Based on boarding and alighting data provided by the Hudson TMA, the highest demand for transit service is along the corridor between the HBLR station and the historic CRRNJ Terminal (89 percent). The Park Office/Visitor's Center bus stop represents most of the activity in the park outside of this corridor with 23 daily boardings and alightings. Also, approximately 25 percent of total trips take place entirely within the park.

The activity centers within the park were also analyzed and subsequently categorized into three tiers of priority for inclusion in the circulator routing. Tier 1 was considered to be the highest priority destinations to be served by a potential circulator service and Tier 3 was considered to be the lowest priority destinations. The stops with the highest number of boardings and alightings on the Hudson TMA bus service would be the most obvious candidates to be served in the future by transit. Based on historic ridership, many of the activity centers along the Audrey Zapp Drive corridor and Liberty Science Center were classified in the Tier 1 category and many of the activity centers along the Freedom Way corridor (including Park Office/South Lawn) were classified in the Tier 2 category.

Tier 3 consists of activity centers with historically low Hudson TMA bus service ridership and no anticipation of growth projections in the future. At this time, it is not recommended that Tier 3 locations be served initially by a future circulator service but could be in the future if new entertainment attractions are developed within the industrial park area or if conditions at an existing activity center change significantly. As proposed, the Liberty State Park circulator service is optimized to serve the travel patterns and peak demand of recreational park users, which does not match the industrial park workers that require service early in the morning and year round.

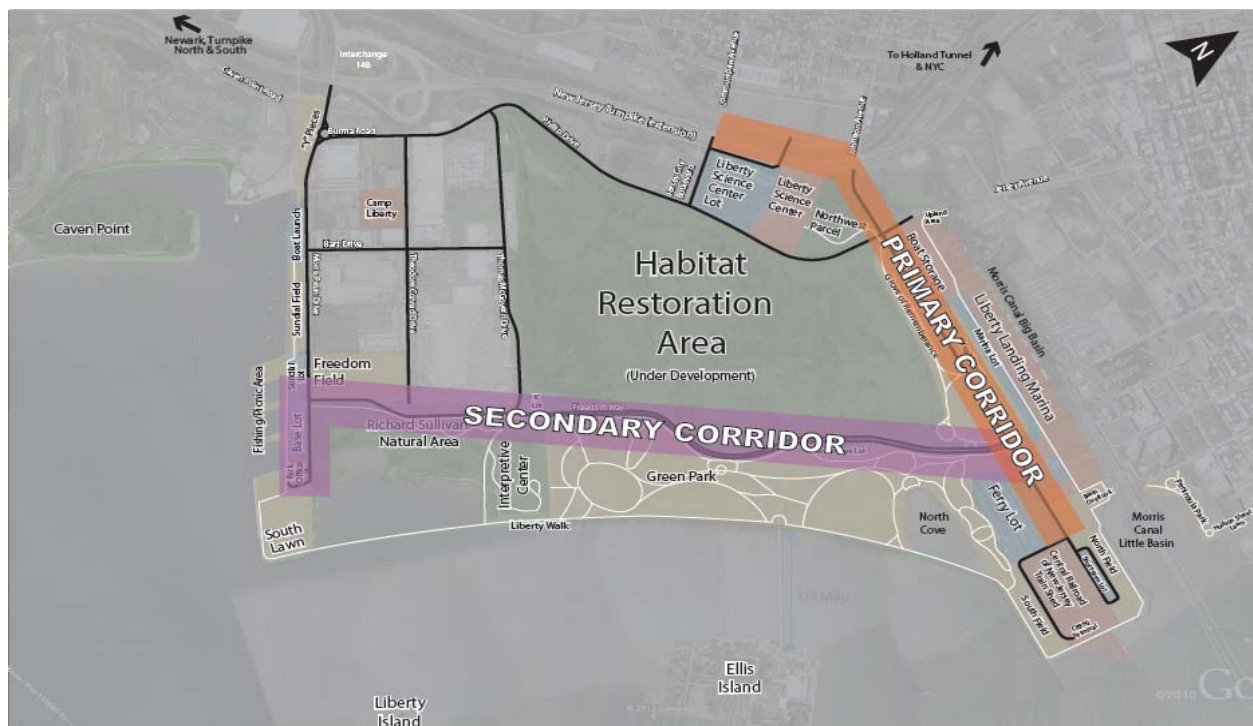
The activity centers were categorized into the following three tiers.

- Tier 1 – must be served:
 - HBLR Liberty State Park Station
 - Liberty Science Center
 - CRRNJ Terminal/Ferry Landing
 - Future Habitat Restoration Area Trails
- Tier 2 – should be served:
 - Liberty Landing/Restaurants
 - Park Office/South Lawn
 - Green Park/Playground

- Tier 3 – service not justified at this time:
 - Industrial Park/Camp Liberty
 - Interpretive Center

Based on the identified tiers of service priority for individual activity centers, two service corridors were identified as shown in Figure ES-3. The “primary corridor” between the HBLR station and the historic CRRNJ Terminal includes the activity centers with the highest transit demand based upon previous Hudson TMA bus service and some intermediate destinations along Audrey Zapp Drive including at least one of the Habitat Restoration Area trail entrances. The “secondary corridor” connects the historic CRRNJ Terminal with the Park Office/South Lawn area including activity centers along Freedom Way such as the Green Park/playground area, Interpretive Center, and two Habitat Restoration Area trail entrances.

Figure ES-3
Transit Service Corridors within Liberty State Park



5.2 POTENTIAL SERVICE VEHICLES

A long list of transit modes/vehicles was compiled for consideration for the Liberty State Park circulator service. This list included all vehicles that could potentially be used for a circulator service, including both bus and rail vehicles. The long list for bus vehicles is as follows:

- Replica trolley (bus)
- Bus guideway
- Bus
- Minibus/jitney

Heavy rail was briefly considered but eliminated early on. Heavy rail's extreme high cost and intensity of associated infrastructure would not be justified by the projected ridership.

The long list for rail is as follows:

- Light rail
- Automated Guideway Transit (AGT)
- Battery/ground level power supply modern streetcar
- Battery-powered historic streetcar
- Battery-powered historic replica streetcar

In order to reduce the long list of mode options to those most appropriate for further study for the circulator service within Liberty State Park, fatal flaw screening criteria was developed as follows:

- Must not require grade separation or barrier
- Must not require excessive infrastructure that does not benefit ridership or running time
- Must not be prohibitively expensive
- Must have sufficient capacity

All of the modes under consideration were evaluated based upon the identified fatal flaw criteria. Modes with one or more of the identified fatal flaws were eliminated from further study. As a result of the evaluation process, light rail, AGT, and bus guideway were each eliminated from further consideration for circulator service within Liberty State Park. As expected, the bus alternatives are the least expensive of the retained options and modern streetcar would likely be the most expensive. Buses also make use of existing infrastructure, do not require any additional right-of-way, and have the flexibility to adjust routing as necessary. They can be ultra-low or zero emissions for an additional cost. The streetcar alternatives range in price but also carry the additional cost of track, charging mechanisms or power supply, car barn, and other required infrastructure. However, electric streetcars inherently have no local emissions. Historic or replica streetcars may have the added benefit of being an attraction to draw additional visitors to the park to ride the service beyond those purely interested in transportation from one point to another.

5.3 PRELIMINARY SERVICE GUIDELINES

In order to help define the characteristics of options for further study in the cost-benefit analysis, preliminary service guidelines were developed to minimize the effect on the surrounding park environment and to maximize the passenger experience.

- Grass track beds and no overhead wires could be standard for streetcar options
- No or ultra-low emissions could be standard for all bus options
- Service design and vehicle selection could promote a scenic tour of the park
- Historic streetcar may be an attraction on its own

5.4 SHORT LIST OF SERVICE OPTIONS

The modes that emerged from the fatal flaw screening and corridors for potential service were refined into discrete options for further study by applying additional considerations. Bus service (standard, replica trolley or minibus) for one or both corridors has the lowest cost and does not require significant additional infrastructure. It should, therefore, be retained as a viable circulator service option.

Historic or historic replica streetcar service was only considered for the Audrey Zapp Drive corridor serving the corridor between the HBLR Station and the CRRNJ Terminal since it has the highest ridership potential. Conversely, projected ridership for the remainder of the park does not justify rail infrastructure and associated requirements at this time. In addition, modern streetcar was not included in the short list of options for further study, as it would not likely act as an attraction to draw additional riders and visitors to the park, as compared with historic or replica streetcar in conjunction with historical park programming. More detailed study beyond the scope of this project should determine whether rehabilitated historic streetcars or new replica streetcars should be used in this case.

Based on the refinement process, the following four transit circulator options were retained for further cost-benefit analysis:

1. **Single bus service corridor:** Service would operate in the Audrey Zapp Drive corridor (Primary Corridor) between the HBLR station and the historic CRRNJ Terminal only. Vehicle type (bus, replica trolley/bus, or mini-bus/jitney) should be determined following a more detailed analysis.
2. **Double corridor bus service:** Service would operate along the two identified service corridors – the Primary Corridor along Audrey Zapp Drive and the Secondary Corridor along Freedom Way. Bus, replica trolley (bus), or mini-bus/jitney may be used and the specific vehicle should be determined following a more detailed analysis.
3. **Single historic/replica streetcar corridor:** This would operate in the Audrey Zapp Drive corridor (Primary Corridor) between the HBLR station and the historic CRRNJ Terminal only. Use of historic or replica streetcar should be determined following a more detailed analysis.
4. **Combination historic/replica streetcar and bus service:** This option entails historic/replica streetcar in the Audrey Zapp Drive corridor (Primary Corridor) between the HBLR station and the historic CRRNJ Terminal and bus service in the Freedom Way corridor (Secondary Corridor) between the historic CRRNJ Terminal and the Park Office/South Lawn area.

6 SERVICE OPTION EVALUATION

6.1 LIBERTY STATE PARK SERVICE OPTIONS

Initial screening and analysis (outlined in the Options for Circulator Service chapter of the final report) led to the elimination of modes of transit that are inappropriate for the park setting and scale of service being considered. Modes of transit retained for further study, in combination with selected corridors for service, form the four options selected for cost-benefit analysis in this phase of the project.

6.1.1 OPTION 1: BUS ON PRIMARY CORRIDOR ONLY

For this option, bus service would be implemented along the Primary Corridor only. Service would operate primarily along Audrey Zapp Drive and serve the Liberty State Park HBLR Station, Liberty Landing Marina, and the CRRNJ Terminal. This option would have a service frequency of 15 minutes during all hours of operation, achievable with one vehicle, and serve the 1.3 mile corridor shown in the service alignment in Figure ES-4. The expected operational speed would be approximately 15 MPH. For the purposes of this study, it is assumed that bus service would be contracted to a private company. Low or no-emission vehicles are recommended for service in the park.

**Figure ES-4
Service Alignment – Option 1**



6.1.2 OPTION 2: BUS ON PRIMARY AND SECONDARY CORRIDORS

Option 2 would expand on Option 1 by extending the bus service approximately 1.9 miles between the CRRNJ Terminal and the Park Office/South Lawn to include the Secondary Corridor (largely along Freedom Way). This option would provide a service frequency of 15 minutes during all hours of operation along both corridors. This headway is achievable with two vehicles in operation to serve the combined 3.2 mile route along both corridors and an expected operational speed of approximately 15 MPH. Both of these vehicles would cover the entire 3.2 mile route in both directions on all runs thus eliminating the need to transfer between buses at the CRRNJ Terminal. The service alignment for Option 2 is shown in Figure ES-5. As with Option 1, it is assumed that bus service would be contracted to a private company.

**Figure ES-5
Service Alignment – Option 2**



6.1.3 OPTION 3: STREETCAR ON PRIMARY CORRIDOR ONLY

For Option 3, historic or historic replica streetcar service would operate along the Primary Corridor. The western terminus of the alignment would be located adjacent to the New Jersey Turnpike across from the Liberty Science Center and the eastern terminus would be located along the display track next to the CRRNJ Terminal. A car barn of approximately 100 feet by 40 feet, including a maintenance pit, would be necessary to store the streetcar when not in operation and to conduct necessary repairs and maintenance. It would be located behind the Liberty Science Center above the visible flood line associated with Hurricane Sandy in late 2012. Streetcar access to the car barn would be provided with a separate track branching off from the mainline. The 28-foot-wide swath along Audrey Zapp Drive just south of the travel lanes is expected to be of a sufficient width to allow for a single streetcar track and tree growth over time. Twelve feet would be allotted for the streetcar alignment, including buffer, and the remainder for tree growth clearance. New signals are assumed at two locations and other grade

crossing treatments are assumed at four locations (two street crossings and two driveways) along the alignment.

Service would be provided with a frequency of 15 minutes during all hours of operation, achievable with a single double-ended vehicle and an operating speed of approximately 15 MPH. The vehicle would be either a historic or historic-replica streetcar with hybrid-electric, hydrogen fuel cell power or would be battery operated with an electric charging station. As a result, no overhead wires or catenary poles would be necessary. For the purpose of this study, it is assumed that vehicles and associated infrastructure would be owned by the operating entity. However, service would be operated and maintained by a private company according to a negotiated contract. The alignment for Option 3 is shown in Figure ES-6. Grass tracks could be used along the length of the alignment.

Figure ES-6
Service Alignment – Option 3



6.1.4 OPTION 4: STREETCAR ON PRIMARY AND BUS ON SECONDARY CORRIDOR

The final service option would combine the historic or replica streetcar service on the Primary Corridor described in Option 3 with bus service on the Secondary Corridor described in Option 2. Service would be provided along the Primary Corridor with a frequency of 15 minutes and a frequency of 30 minutes along the Secondary Corridor during all hours of operation. This would be achievable with one streetcar vehicle and one bus vehicle. This means that every other streetcar would be met by a timed transfer for passengers traveling on the Secondary Corridor. All passengers traveling northbound on the Secondary Corridor would always have a streetcar connection while passengers in half of the streetcars wishing to travel southbound on the Secondary Corridor would need to wait 15 minutes for connecting service. Achieving a frequency of 15 minutes on the Secondary Corridor with no wait for any connecting streetcar passengers would require a second vehicle that would essentially double the cost

of bus service for this option. If warranted, due to high ridership, a second vehicle could be added. Approximate operational speed for both corridors is assumed to be 15 MPH. The alignment for Option 4 is shown in Figure ES-7.

As with the above options, streetcar vehicles and associated infrastructure would be owned by the operating entity but operated and maintained by a private company according to a negotiated contract. For bus service, vehicles would be owned, operated and maintained by the providing company, according to terms negotiated as part of a contract. It is possible that the same company could operate both the streetcar and bus services. Streetcar vehicles could be double-ended, hybrid-electric, hydrogen fuel cell-powered historic or replica cars. As such, no overhead wires or catenary poles would be needed and grass tracks could be used along the length of the alignment. Buses should be low or no-emission vehicles.

**Figure ES-7
Service Alignment – Option 4**



6.2 RIDERSHIP ESTIMATES

Ridership projections were developed for each of the four service options using the results of the travel demand modeling conducted for this study, quantitative methods outlined in various Transit Cooperative Research Program (TCRP) reports, and professional engineering judgment. The travel demand model output for the years 2011, 2020, and 2035 were used as baseline ridership. The travel demand model assumed a circulator service similar to the discontinued NJ TRANSIT #305 route and the subsequent Hudson TMA bus service. The full methodology of how baseline ridership projections were calculated is detailed in the Future Conditions chapter of the final report.

Based on historical stop-level data provided by the Hudson TMA, 90 percent of the service's projected ridership would occur on the Primary Corridor with the remaining 10 percent occurring on the Secondary Corridor. As such, ridership estimates for service options that only include service along the Primary Corridor begin with a baseline of 90 percent of the total ridership in Table ES-1 (on page 9). The additional 10 percent is added back into the total for options that provide service on the Secondary Corridor as well.

The first and most substantial contributor to projected ridership increases above the baseline projections is the improved service frequency of the circulator options over the previous bus service and resulting reduced average wait times. The discontinued NJ TRANSIT #305 route had a service frequency of 40 minutes, resulting in an average wait time of 20 minutes. Service frequencies of 15 minutes would be provided for Options 1 and 3 on the Primary Corridor and for both corridors with Option 2, resulting in an average wait time of 7.5 minutes. A service frequency of 15 minutes would be provided for Option 4 on the Primary Corridor and 30 minutes on the Secondary Corridor. This would result in average wait times of 7.5 minutes and 15 minutes, respectively. For every minute reduction in average waiting time, ridership is anticipated to increase by 2.5 percent.

The case can be made that the upgrades, features, and improvements to the service being proposed over what existed previously is comparable to upgrading an existing standard transit route to a premium service. As such, Table ES-2 provides the premium features proposed in each of the four service options and the ridership gain that can be expected from each feature.

Table ES-2
Estimated Ridership Increases Resulting From Premium Service Features

Premium Service Feature	Option 1	Option 2	Option 3	Option 4	
				Primary Corridor	Secondary Corridor
<i>Separated Right-of-Way</i>	--	--	3.75%	3.75%	--
<i>Level Boarding</i>	--	--	1.25%	1.25%	--
<i>Uniquely Designed Vehicles</i>	1.25%	1.25%	1.25%	1.25%	1.25%
<i>Clear Simple Service Plan</i>	1.00%	1.00%	1.00%	1.00%	1.00%
<i>Uniquely Designed Shelters</i>	0.50%	0.50%	0.50%	0.50%	0.50%
<i>Service Branding (Vehicles, Brochures)</i>	2.50%	2.50%	2.50%	2.50%	2.50%
Total Ridership Percentage Gained from Premium Service Features	5.25%	5.25%	10.25%	10.25%	5.25%

Source: TCRP Report 118

Another factor contributing to projected ridership increases is a novelty factor associated with the streetcar service options. This factor is projected to provide an additional 10 percent increase in service ridership to the streetcar-based service options and is applied on top of the gains from service improvements and added premium features. This factor is applied to account for additional visitors that would either come to the park with the specific intention of riding the historic streetcar service or that would ride the streetcar as an attraction, as part of a visit that would not have otherwise involved transit. Applying a 10 percent increase would equate to approximately 32 riders per day (7,700 riders over 242 service days).

Supporting literature on ridership increases associated with unique transit experiences is limited. This is especially true for finding a comparable scenario in a park setting. Conversations with Ed Tennyson,

streetcar expert from the American Public Transit Association, and reports on the conversion of the F Line in San Francisco from a bus route to a historic streetcar line suggest that an increase of 40 percent over bus service has been observed due to the draw of a historic streetcar. In addition, the historic streetcar in Lowell, Massachusetts, which provides access to the Lowell National Historical Park and Streetcar Museum, is a comparable example of visitors attracted to the experience of riding a historic streetcar. Given this information, a conservative estimate of a 10 percent increase was made regarding the number of people that would be drawn to Liberty State Park solely for the experience of riding a historic streetcar.

6.3 POTENTIAL IMPACTS AND BENEFITS

All four options were qualitatively assessed to determine if there was potential for causing impacts to the park environment in which they would operate and the related benefits that would be derived from their implementation. The areas considered for potential impacts include air/emissions, noise, wetlands, visual, historic resources, contaminated soil, vegetation/open space, and pedestrians/vehicles. The impact assessment was conducted separately for streetcars and buses as they would affect the park differently. The implementation of transit service to Liberty State Park would provide benefits that uniquely apply to each option.

6.4 CAPITAL AND OPERATING COSTS

The estimated costs associated with each service option were determined based on research of best practices and current services operated throughout the country and the world. Each cost estimate details initial capital costs and annual operating and maintenance costs represented in 2013 dollars. A contingency of 30 percent for design and construction was applied to the initial capital costs for all options. High and low estimates were developed for streetcar capital cost estimates as it is not known whether some items will be necessary or, in some cases, to account for a range in costs of a particular item. Cost estimates for each service option are summarized and compared in Table ES-3.

**Table ES-3
Summary of Cost Estimates (Options 1 through 4)**

Service Options	Capital Costs		Annual Operating & Maintenance Costs
	Low	High	
Option 1 – Bus, Primary Corridor	\$71,175		\$450,000
Option 2 – Bus, Primary and Secondary Corridors	\$129,675		\$900,000
Option 3 – Streetcar, Primary Corridor	\$3,279,027	\$5,324,967	\$639,909
Option 4 – Streetcar on Primary Corridor, Bus on Secondary Corridor	\$3,376,527	\$5,422,467	\$1,089,909

6.5 EVALUATION MATRIX

The following matrix (Table ES-4) summarizes capital costs, operations and maintenance costs, ridership, and potential impacts and benefits of the four retained options.

**Table ES-4
Evaluation Matrix**

	Option 1: Bus on Primary Corridor	Option 2: Bus on Primary and Secondary Corridors	Option 3: Streetcar on Primary Corridor	Option 4: Streetcar/Bus Combination
Benefits	<ul style="list-style-type: none"> • Small initial capital investment • Short implementation timeline • Relatively easy service expansion 	<ul style="list-style-type: none"> • Small initial capital investment • Short implementation timeline • Relatively easy service expansion • Serves both park corridors 	<ul style="list-style-type: none"> • No local emissions • Achieves sense of "permanence" • Additional ridership from streetcar novelty • Hydrogen fuel cell may be basis for Liberty Science Center collaboration 	<ul style="list-style-type: none"> • Serves both park corridors • Achieves sense of "permanence" • Additional ridership from streetcar novelty • Hydrogen fuel cell may be the basis for Liberty Science Center collaboration
Impacts	<ul style="list-style-type: none"> • Possible local emissions • Possible engine noise 	<ul style="list-style-type: none"> • Possible local emissions • Possible engine noise 	<ul style="list-style-type: none"> • May impact up to 8 trees • May involve avoiding contaminated soil • 2 grade crossings, 2 parking lot crossings 	<ul style="list-style-type: none"> • Possible local emissions • Possible engine noise • May impact up to 8 trees • May involve avoiding contaminated soil • 2 grade crossings, 2 parking lot crossings
Initial Capital Costs	\$71,175	\$129,675	\$3,279,027 - \$5,324,967	\$3,376,527- \$5,422,467
Annual Operation and Maintenance Costs	\$450,000	\$900,000	\$639,909	\$1,089,909
First-Year Ridership Estimate	73,710	81,900	84,051	90,991

7 IMPLEMENTATION

7.1 POTENTIAL FUNDING SOURCES

A strategy for implementing the transit options that have been developed to serve Liberty State Park considered conventional available funding sources as well as creative financing tools. Funding sources that have been used in the past to support previous transit service in the park and potential future funding sources were identified, including federal, state and local agencies, private contributions, and user fees/fares. Due to the current economic climate, traditional transportation funding has become less available and uncertain. As a result, all reasonable potential sources and strategies were investigated.

Since one funding source may not cover all capital and operating costs, funding from different sources could be bundled to meet the financial obligation for implementing transit service for Liberty State Park. In addition, the required funding may not be available to initially implement a full transit option. This would require the phased implementation of a transit option over time as the requisite funding becomes available to cover capital and operating costs.

Federal Transit Administration (FTA) Grant Program - Based upon the criteria, the Very Small Starts program is geared towards weekday commuter service that carries high volumes of people at a relatively modest cost. As a result, the criteria do not apply favorably towards a recreationally based transit service like the Liberty State Park circulator. Based on the prescribed service features, the Liberty State Park circulator would not meet more than half of the criteria needed to qualify for the Very Small Starts program. Nevertheless, although not a perfect fit, it is advisable to contact the FTA to explore if some monies could be obtained through this funding source.

US Department of Energy - Although the funding is for research and development of alternative fuel vehicles, transit vehicle technology could be used as a test case for the Liberty State Park Circulator that would reduce the cost to operate the service. More information can be found here: http://www1.eere.energy.gov/vehiclesandfuels/financial/solicitations_detail.asp?sol_id=586.

Federal Lands Access Program (FLAP) -The Sarbanes Transit in Parks Program, operating under the auspices of the FTA, was repealed with the adoption of MAP-21. A new program was developed as part of MAP-21 called the Federal Lands Access Program (FLAP). The FLAP funding is authorized at \$250,000,000 annually for each year of MAP-21 and it is distributed to each State, District of Columbia, and Puerto Rico according to a prescribed formula: The majority of FLAP funding totaling 80 percent will be distributed to States that contain at least 1.5 percent of the total public land in the United States. The 12 "preference States," that meet this definition are: Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The remaining 20 percent of the FLAP funds will be distributed to the other 38 States, District of Columbia, and Puerto Rico. For eastern states like New Jersey that have significantly less public land than most states, their share of the FLAP funding will be relatively small. New Jersey's annual share of FLAP funding will be approximately \$200,000. This money would be further subdivided between eligible projects within New Jersey. All FLAP money received in New Jersey would require a 19.86 percent local match.

Within each State, a three-party Programming Decisions Committee (PDC) will be responsible for the rating, ranking, and prioritization of the projects potentially eligible for the receipt of FLAP funds. The PDC must be comprised of the following representatives:

- The Federal Highway Administration (FHWA);
- The State Department of Transportation; and
- An appropriate political subdivision of the State that will be jointly selected by the State DOT and the FHWA

An Eastern Federal Lands website for the program has been established at <http://www.efl.fhwa.dot.gov/programs/federal-lands-access.aspx>. Specific information provided on the website for each state will be updated as it becomes available. In New Jersey, the PDC is comprised of a State Representative (David Kuhn, Assistant Commissioner, Capital Investments New Jersey Department of Transportation), Local Representative (Frank Scarantino, President, New Jersey County Engineer's Association), and FHWA Representative (David Payne, Access Program Manager). All project proposal applications for FLAP funding in New Jersey will be screened and rated by this PDC. As of spring 2013, all necessary internal and external processes and procedures were in development so that a call for applications in New Jersey could be issued by the fall of 2013. It is anticipated that the application process will be similar to that of the Sarbanes Transit in Parks Program.

Based on the adoption of MAP-21, the FLAP program appears to be the best option to acquire federal funds for further study and implementation of the proposed Liberty State Park circulator.

National Park Service (NPS) - There is no funding available directly through the NPS for the Liberty State Park circulator. The NPS could support funding through the FLAP since the proposed Liberty State Park circulator would improve connectivity to the national monuments. Also, the NPS staff could be used as a resource to elicit ideas about how funds might be assembled for the Liberty State Park circulator.

User Fees - Currently, park user fees and concession fees go to general revenue and are not dedicated for park use. If permitted by the NJDEP Division of Parks and Forestry, a small transportation fee could be added to the cost of some or all of these user fees or a portion of the concession fees could be used to help pay for the proposed Liberty State Park circulator.

Donation of Materials - The Liberty Historic Railway has pledged to donate a number of streetcar items for the proposed service including an original historic streetcar that has not been rehabilitated, sufficient track for the length of the alignment, and all necessary maintenance equipment. For the streetcar options, the donation of these items would represent a significant cost savings.

Private Sponsorship/Advertising - Corporate sponsorship could be used to raise money needed to support part or all of the proposed Liberty State Park circulator.

Not-For-Profit - Several organizations in the area could participate in a fundraising campaign or donate money to help bring transit service back to Liberty State Park.

Unified Planning Work Program (UPWP) – The lead agency could work with NJDOT or NJ TRANSIT to include [any further federally-required analysis of the rail options](#) as part of the Regional Transportation Plan (RTP) so that ultimately it could be funded as part of the North Jersey Transportation Planning Authority's (NJTPA) UPWP.

7.2 IMPLEMENTATION STRATEGY

It is a reality that traditional transportation funding has become less available and uncertain in today's economic climate. The competition for these limited resources has become extremely competitive. The Federal Lands Access Program (FLAP) program created under MAP-21 appears to be the best option to acquire federal funds for further study and implementation of the proposed Liberty State Park circulator. Based on the available information, the following steps should be used to develop and implement a Liberty State Park circulator:

7.2.1 LEAD AGENCY

In order to move forward, an agency must take the initiative for overseeing the Liberty State Park circulator. This role is pivotal as the driver for ultimately establishing the service. The lead agency would be responsible for preparing grant applications to secure long term federal funding and other funding sources (corporate sponsorship, fundraising, etc.) needed for studying, planning, procuring, and implementing the service.

7.2.2 TIMEFRAME

Very Short Term - Summer 2013

The rail options have a much higher start-up cost and would require a very robust funding steam. It would also take time and money to further study and design the rail option before it is built. Conversely, the bus option is "shovel-ready" and much less expensive to implement. Bus service between the Hudson-Bergen Light Rail (HBLR) station and the historic CRRNJ Terminal could be implemented without much advanced planning. It is not imperative that shelters be constructed initially to operate the bus service. However, marketing the service through the websites of the study's Technical Advisory Committee members and other stakeholders would be critical for promoting ridership. A more elaborate marketing campaign with a budget of about \$5,000 to \$10,000 could include local newspaper ads, flyer distribution to park attendees, ads within the HBLR system, inserts in mailings sent out by Liberty State Park, etc. If a lead agency cannot be immediately identified, perhaps the Hudson TMA could assist with the planning, marketing, and procurement process to hire a private operator since they have experience with operation of shuttles.

It is recommended that a modest service would be operated on only nine weekends and two holidays in July, August, and September of 2013. The launch of the service could be synchronized with the reopening of the Statue of Liberty on July 4, 2013. Therefore, the service could operate for 20 days starting on July 4 and ending on September 2 (Labor Day). This service would cost approximately \$40,000 for a contractor to operate (based on recent bids for shuttle bus service in the New York Metropolitan area) and some start-up costs. Since there is not enough time to procure federal funding for 2013, alternative funding could be pursued. There would also not be enough time to change NJDEP Division of Parks and Forestry policy to use a portion of park user fees to cover all or most of this service. The most likely candidates for procuring funds would be the use of corporate sponsorship to raise the money needed to support the proposed Liberty State Park circulator. Also, a fundraising campaign targeting private donations could be initiated by local non-profit groups to help bring transit service back to the park.

Short Term – 2014 and 2015

Once a schedule has been established for soliciting eligible projects, the lead agency can submit a formal application for FLAP funding for the operation of bus service or the study of rail options. It is likely that the call for applications will occur by the fall of 2013. However, it is unclear at this point how

long the process will take and if the Liberty State Park circulator would be selected. Since New Jersey has significantly less public land than most states, their share of the FLAP funding will be relatively small at approximately \$200,000 annually for two years. Competition for this funding will most likely be very stiff. It is unlikely that FLAP could by itself fund the capital costs for a rail option that is estimated to be in excess of \$3 million. FLAP funding could be a source for further study of Liberty State Park Circulator options. In addition, stakeholders could work with their Congressional delegation on a federal legislative initiative in the federal FY 2015 re-authorization of MAP-21 to add a small discretionary pot for “non-preference” states like New Jersey.

The lead agency could retain the services of a grant consultant to cobble funding from a variety of sources to operate the full bus service option, study the rail options, and/or to fund start-up and operating funds for the rail option. If a longer term funding source is available, part of that money should be used to advance the marketing to include branding of the service.

If no FLAP funds can be procured in the short term, the lead agency could re-launch the modest two-month summer bus service to be operated on only weekends and holidays along with the marketing campaign proposed in the Very Short Term plan. Funding for this service could come from the use of corporate sponsorship and a fundraising campaign targeting private donations to continue the bus service. The lead agency could work with NJDOT or NJ TRANSIT to include [any further federally-required analysis of the rail options](#) as part of the RTP so that ultimately it could be funded as part of the UPWP.

Long Term – 2016 and Beyond

FLAP funding or other relevant funding sources should be pursued by the lead agency to continue to support limited bus service, operate the full bus service option, study the rail options, and/or to fund start-up and operating funds for the rail option. If a rail service option is warranted and funding is secured, the operation of the bus service option should continue in order to meet the purpose and need until implementation of a rail service. If rail funding is never secured, the bus option would serve the purpose and need.

8 PUBLIC INVOLVEMENT

8.1 PROJECT WEBSITE

A project website was developed in both English and Spanish to inform the public of the study. The website (<http://www.lsptransitstudy.com>) went live in June 2012 and was updated throughout the course of the study. The study-specific website included an overview of the study, key work products, and contact information. The homepage included a section for announcements.

8.2 TECHNICAL ADVISORY COMMITTEE (TAC)

A TAC comprised of key stakeholders was formed to guide the study process and met several times throughout the study.

The TAC played a pivotal role throughout the course of the study in the following capacities:

- Provided critical data
- Identified previous studies
- Provided input on park operations and specific knowledge on function of park
- Contributed feedback on ideas for survey instrument and assisted with survey implementation
- Provided input on options for potential circulator
- Assisted in the development of evaluation criteria
- Reviewed consultant reports and work products
- Provided specific knowledge on function of park
- Assisted with public outreach, including the preparation of public meetings

8.3 PUBLIC MEETINGS

Two public meetings were held in Jersey City City Hall throughout the course of the study as a means to solicit public input. The purpose of the first public meeting on January 24, 2013 was to introduce the public to the study and to solicit input of work completed to-date, including the identification of potential corridors and modes for a circulator service. The purpose of the second public meeting on May 9, 2013 was to present findings of the study to the public, including the costs and benefits of four, short-listed options for the circulator, potential funding sources, and an implementation strategy. Both public meetings included an open house during which exhibits were on display and project team members were available to answer questions, make formal presentations, and lead Q+A sessions. Public comment periods followed both public meetings during which written comments could be submitted via e-mail or US mail.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS

All four options were qualitatively assessed for potential impacts to the park environment in which they would operate and the related benefits that would be derived from their implementation. All options offer improved access to Liberty State Park. Serving both the Primary and Secondary Corridors would provide greater access to park visitors than the options that only serve the Primary Corridor but would cost more money to implement. Any of the four feasible options could be implemented to meet the established Purpose and Need.

Bus service (standard, replica trolley or minibus) for one or both segments has the lowest cost and does not require significant additional infrastructure. This service has a small initial capital investment (approximately \$71,000) with a short implementation timeline. This service is scalable and provides relatively easy service expansion as needed. Depending upon the vehicle selected, the emissions and engine noise could vary. Service on the Primary Corridor would initially generate approximately 73,700 annual riders and would cost approximately \$450,000 annually to operate.

Rail service (historic or historic replica streetcar) would only be considered for the Audrey Zapp Drive corridor serving the segment between the HBLR Station and the CRRNJ Terminal, since this corridor has the highest ridership potential. Conversely, projected ridership for the remainder of the park does not justify rail infrastructure and associated requirements at this time. The rail service would not produce local emissions, it would achieve a sense of "permanence", and the hydrogen fuel cell technology could be the basis for Liberty Science Center collaboration. Rail service would require two grade crossings and two parking lot crossing, may impact up to eight trees, and may require avoiding contaminated soil when the tracks are installed. Additional study and engineering would be required before implementation of rail service.

Unlike the bus service, rail service has a very large initial capital investment (ranging from approximately \$3 million to over \$5 million depending upon the amount of donated equipment that could be used) with a longer implementation timeline. Because of the infrastructure costs, this service would not be easy to expand to other parts of the park. Rail service on the Primary Corridor would generate approximately 84,000 annual riders. This would be higher than bus service since additional ridership would be captured from people interested in the experience of riding a historic streetcar. The cost to operate the streetcar on an annual basis would be approximately \$640,000.

In the current economic climate, funding for implementation and/or additional study of any of the four options is scarce. The implementation of a circulator will most likely require the efforts of many agencies and funding from multiple sources.

9.2 RECOMMENDATIONS

Based on the conclusions derived from the study, the following action items are recommended:

1. Selection of a Lead Agency – A single agency (or group of agencies) must take ownership of the Liberty State Park circulator to maintain the momentum of the study. The lead agency would be responsible for preparing grant applications to secure long-term federal funding and other funding sources (corporate sponsorship, fundraising, etc.) needed for studying, planning, procuring, and implementing the service. Without the leadership of a lead agency, the effort to establish a transit circulator for Liberty State Park would be fractured and uncoordinated.

2. Very Short Term Implementation (2013) - A modest service could be operated on only nine weekends and two holidays in July, August, and September of 2013 for 20 days starting on July 4 and ending on September 2 (Labor Day). The launch of the service could be synchronized with the reopening of the Statue of Liberty on July 4, 2013. This service would cost approximately \$40,000 for a contractor to operate (based on recent bids for shuttle bus service in the New York Metropolitan area) and some start-up costs. Depending on the negotiated operating cost, there could be money within the \$40,000 budget for an elaborate marketing campaign (with a cost of about \$5,000 to \$10,000) that could include local newspaper ads, flyer distribution to park attendees, ads within the HBLR system, inserts in mailings sent out by Liberty State Park, etc. Short-term funding could come from corporate sponsorship or a fundraising campaign targeting private donations that could be initiated by local non-profit groups to help bring transit service back to the park.
3. Apply for Federal Lands Access Program (FLAP) Funding - This appears to be the best option to acquire federal funds for further study and/or implementation of the proposed Liberty State Park circulator. The lead agency could submit a formal application for FLAP funding once there is a call for applications (most likely by the fall of 2013).
4. Apply for FTA Very Small Starts Funding - Although not a perfect fit, it is advisable for the lead agency to contact the FTA to explore if some monies could be obtained through this funding source.
5. Retain Grant Consultant - The lead agency could retain the services of a grant consultant to cobble funding from a variety of sources to operate the full bus service option, to study the rail options, and/or to fund start-up and operating funds for the rail option. If a longer-term funding source is available, part of that money should be used to advance the marketing to include branding of the service.
6. Short Term Implementation (2014 - 2015) - In terms of FLAP funding, it is unclear at this point exactly how long the process will take and if the Liberty State Park circulator would be selected. New Jersey's share of the FLAP funding at approximately \$200,000 per year is relatively small due to allocation formula. Competition within the state to receive this money will most likely be very stiff. It is unlikely that FLAP could by itself fund the capital costs for a rail option that is estimated to be in excess of \$3 million. However, FLAP could fund bus service or a study of rail options. If no FLAP funds can be procured in the short term, the lead agency could re-launch the modest two-month summer bus service to be operated on only weekends and holidays along with the marketing campaign proposed in the Very Short Term plan. Funding for this service could come from the use of corporate sponsorship and a fundraising campaign targeting private donations to continue the bus service. The lead agency could work with NJDOT or NJ TRANSIT to include [any further federally-required analysis of the rail options](#) as part of the RTP so that ultimately it could be funded as part of the UPWP.
7. Re-authorization of Moving Ahead for Progress in the 21st Century (MAP-21) - Stakeholders could work with their Congressional delegation on a federal legislative initiative in the federal FY 2015 re-authorization of MAP-21, the federal transportation funding and authorization bill, to add a small discretionary pot of funding for "non-preference" states like New Jersey.

8. Long Term Implementation (2016 and Beyond) - FLAP funding or other relevant funding sources should be pursued by the lead agency to continue support of limited bus service, operate the full bus service option, study the rail options, and/or to fund start-up and operating funds for the rail option. Bus service could operate while rail options are studied and, if warranted, implemented/constructed. If rail funding is never secured, the bus option would serve the purpose and need for a circulator determined by this study.



NEW YORK

*611 Broadway, Suite 415
New York, NY 10012
(212) 598-9010*

NEW JERSEY

*744 Broad Street, Suite 2090
Newark, NJ 07102
(973) 639-9629*