



District Department of Transportation

# DC Streetcar System Plan

H St/ Benning Rd and Future Segments and Extensions

October 2010



## EXECUTIVE SUMMARY

The District Department of Transportation (DDOT) has initiated construction on two streetcar lines, H St/ Benning Rd and Anacostia Initial Line Segment planning on additional extensions in Wards 7 and 8. It has also completed the DC Transit Future System Plan – the District’s first comprehensive streetcar system plan.

This document provides a detailed description of DDOT’s plans for streetcar operations, and covers topics such as operations, safety, fare collection, funding, and design and construction.

- DDOT will initiate operations of streetcars in spring 2012.
- Creates 200 permanent, First Source-eligible jobs at the onset of service; up to 700 with completion of the entire system
- DDOT is pursuing \$110M in federal funds to pay for two streetcar extensions east of the river
- Identifies \$180M to pay for two streetcar extensions east of the river which would not impact any capital projects or operating programs
- Streetcar investment will relieve core capacity problems on Metrorail and Metrobus service
- Streetcar operations will be comparable in cost to WMATA bus, with a higher quality ride
- Resolves issues with power supply; streetcar will utilize overhead wires on first two lines and will move to wireless operation as the system expands
- Creates a framework to develop a financial plan and governance structure for the entire system

## OVERVIEW

On July 2, 2010 the Mayor signed the FY2010 Balanced Budget Support Emergency Act 2010. Within that Act section 1902 stipulates that “[o]f the capital funds allocated for the Streetcar Project (SA-306), \$34.5 million shall be subject to the approval by the Council of the District of Columbia of a comprehensive plan for financing, operations and capital facilities of the streetcar project.”

DDOT is providing Council with a system plan for approval of the entire streetcar system. It is also providing a more detailed plan for the lines currently under construction and those in the advanced stages of planning. Council’s adoption of the system plan will guide planning efforts for all future extensions and release the remaining \$34.5M in funds for H St/Benning Rd Phase II.

DDOT has initiated construction on two streetcar segments, as well as detailed planning for two extensions. The two ongoing construction projects are The H St/Benning Rd streetcar and the Anacostia Initial Line Segment.

The H St/Benning Rd streetcar project is a 2-mile streetcar line operating along tracks located within the existing travel lanes. The project will operate from the intersection of 1<sup>st</sup> St NE and H St NE to the intersection of Benning Rd NE and Oklahoma Ave NE. The line will connect Union Station to the H Street NE business district, as well as the Benning Road business and residential area. The line will have double tracks, one for eastbound and one for westbound vehicles, and operate in mixed traffic. It will have seven stops: Union Station; 5<sup>th</sup> St NE/H St; 8<sup>th</sup> Street NE/H St; 13<sup>th</sup> St NE/H St; 15<sup>th</sup> St NE/Benning Rd; 19<sup>th</sup> St NE/ Benning Rd; Oklahoma Avenue NE/Benning Rd.

The Anacostia Initial Line Segment is a .75 mile streetcar line from 2750 South Capitol St to the Anacostia Metro. It will connect the Naval Annex to Barry Farm and then the Anacostia Metro station.

DDOT has also initiated detailed planning for two extensions of the streetcar system along Benning Rd and in Anacostia. This plan provides detail on both of those extensions. DDOT is also working with

other District agencies, such as the Office of Planning (OP), that have initiated citywide, streetcar-related planning efforts in order to coordinate the District’s investment in streetcar.

## **PROJECT BACKGROUND**

DC Streetcar is the product of over a decade long series of studies and plans beginning in 1997 with the completion of the *Transportation Vision, Strategy and Action Plan* by the District Department of Public Works. The 1997 plan identified the continued need for better internal cross-town travel by transit. The plan also identified the key corridors that would benefit from increased transit investment, including “light rail” (a precursor to the development of modern streetcars) on H St/Benning Rd and Georgia Ave (Appendix A). In 2001, the *DC Transit Development Study* further assessed the feasibility of the candidate corridors for high-capacity transit investment.

### **District of Columbia Transit Alternatives Analysis (DCAA)**

In 2003, DDOT initiated the *DC’s Transit Future (DCTF) System Plan and Alternatives Analysis (AA)* which consisted of a comprehensive assessment and evaluation of alternative modes and levels of investment in 14 corridors across the District. The evaluation compared the performance of Bus Rapid Transit (BRT) and streetcar modes to no-build options in each of the system corridors. The evaluation considered more than 30 individual measures that addressed the following four primary goals established for the project:

- Improve Access and Mobility
- Encourage Community and Economic Development
- Enhance System Performance
- Promote Environmental Quality

The process resulted in an integrated system of recommended transit service investments in the District, including combinations of streetcar, Bus Rapid Transit (BRT), and enhanced bus service in appropriate corridors. The *DCTF System Plan and Alternatives Analysis (AA)* was substantially completed in 2005 and updated in 2008 and

2010. The updated AA is available for review at [www.ucgsupportdc.com](http://www.ucgsupportdc.com).

Implementation of the enhanced bus services proposed in the plan began in 2007 with the new *Metro Extra* (since rebranded *Metro Express*), a limited-stop bus service in the Georgia Avenue Corridor and 16<sup>th</sup> Street NW. DDOT and WMATA will launch the X9 limited stop service for the H St/Benning Rd corridor in December 2010. DDOT also completed an Environmental Assessment for the K Street NW Centerway (designed initially for BRT service with later conversion to streetcar).

Implementation of the recommended streetcar element of the plan was divided into three major phases. The District is currently constructing two Phase 1 streetcar projects: (a) H Street NE and Benning Rd NE between Union Station and Oklahoma Avenue NE and Benning Rd NE; and (b) the Anacostia Initial Line Segment (AILS), connecting the Anacostia Metro Station to Naval Annex.

A goal of the multi-corridor, multi-modal system plan was to identify additional connections between the existing Metrobus and Metrorail lines and between key activity centers within the District. The system plan also supports community development initiatives articulated in the District's Comprehensive Plan. The revised system plan reflects the results of continuing coordination with the DC Office of Planning (DCOP), DC Deputy Mayor's Office for Planning and Economic Development (DMPED), National Capital Planning Commission (NCPC), Washington Metropolitan Area Transit Authority (WMATA), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and DDOT. Finally, the revised system plan also incorporated the results of an extensive public outreach effort that included public meetings in each of the eight wards of the District in Fall 2009.

### **Great Streets Initiative: H Street NE-Benning Road Framework Plan (2005)**

The Great Streets Initiative is a multidisciplinary approach to corridor improvements composed of public realm investments, strategic land use plans, public safety strategies, and economic development assistance. It is a partnership between multiple District government departments and offices, including DDOT, OP and DMPED. There are six target corridors for improvement under the Great Streets Initiative,

including the H St NE/Benning Rd corridor. The 2006 *H Street NE-Benning Road Great Streets Framework Plan* (see [www.ucgsupportdc.com](http://www.ucgsupportdc.com)) for the 5-mile corridor included recommendations for \$30 million in improvements to the roadway, pedestrian facilities, bicycle facilities, transit facilities, and vehicle/parking facilities.

The Great Streets project along H St/Benning Rd is a complete reconstruction of the right of way from building face to building face. The current construction on H St and Benning Rd was initiated as part of the Great Streets Initiative. Given the need to reconstruct H St and Benning Rd and the need to construct streetcar tracks, DDOT elected to pursue both projects simultaneously. These projects comprise the first phase of streetcar construction along H St/Benning Rd.

## **H ST/ BENNING RD NE**

### **Purpose**

The second phase of construction along H St/Benning Rd NE will complete an operable streetcar line in the corridor, providing high-capacity and high-quality transit service to District residents. The District's investment in transit infrastructure will catalyze economic development in the emerging commercial and residential corridor.

### **Need**

The H St/Benning Rd NE corridor hosts the region's busiest bus line and demand continues to grow as the District's population continues to increase. Currently, the H St corridor relies heavily on Metrobus lines. Metrobus routes X1, X2, X3, and U8 currently operate along the corridor and collectively carry more than 18,000 daily passengers. The corridor needs new transportation services for residents and workers within the District that will connect activity centers, facilitate intermodal transfer opportunities, and relieve crowded Metrorail and Metrobus lines. The corridor also serves an area that the District has targeted for commercial and residential redevelopment. The streetcar line will support neighborhood plans for medium- to high-density mixed-use development.

The District selected streetcar for this corridor because it performed best against the following goals:

1. Access and Mobility
2. Community and Economic Development
3. System Performance
4. Environmental Quality

The streetcar will also offer a number of service quality improvements, including:

1. High vehicle capacity to serve high-ridership transit corridor;
2. Ease of boarding/ alighting for persons of all abilities and ages;
3. Smooth running movement which allows safer and more convenient use by person of all abilities and ages; and
4. Quiet and emission-free operation which does not detract from adjacent public streetscapes/ spaces;

DDOT anticipates the H St/ Benning Rd Line will provide critical transportation linking Union Station with the H Street and Benning Rd corridor providing a transit alternative to overcrowded Metrobus lines while simultaneously linking low-income residents with critical social services and access to jobs in downtown DC, the largest job center in the region. It will also support the emerging business district along H Street and Benning Rd.

### **Current Construction**

DDOT is installing streetcar tracks on H St and Benning Rd as part of roadway reconstruction of Benning Road NE, from 14th Street NE to Oklahoma Ave NE, and H Street NE, from 3rd Street NE to 14th Street NE. Given the long-term goal of building streetcar on H St/Benning Rd, DDOT incorporated tracks into the project in order to minimize construction costs and community interruption. The Benning Road component of the project began in December 2007 and is substantially complete. The H Street component began in September 2008 and is scheduled for completion in 2011. Work includes

reconstruction of the travel lanes and parking areas with composite pavements, new brick gutter and granite curbs; streetcar track installation; sidewalk restoration; upgrading of pedestrian street lighting and signals; installation of bulbouts, crosswalks, and wheel chair ramps; landscaping upgrades; and a new pedestrian plaza.

### **Lane Configurations/Crossings**

The streetcar tracks will operate in the median of Benning Rd from Benning Rd and Oklahoma Ave to the Starburst Intersection. At the Starburst Intersection the tracks transition to the curb lane. From the Starburst Intersection to the intersection of H St and 3<sup>rd</sup> St NE the tracks will operate on the curb lane. At 3<sup>rd</sup> St NE travelling west, the tracks will move from the curb lane to the center lane and travel through a portal in the H St Overpass (as it did prior to the bridge's construction in 1974). At that point they will travel under the Union Station train storage yard and pass across 1<sup>st</sup> St NE to a storage and maintenance facility underneath the Western Abutment of the H St Underpass.

### **H St/ Benning Rd Phase II Alternatives Analysis**

In addition to the construction of streetcar tracks on H Street and Benning Road, there several additional elements required for a fully operable streetcar line. These elements, herein referred to as H St/ Benning Rd Phase II, are funded through the FY2010 Balanced Budget Support Emergency Act 2010, pending Council approval of this plan. The elements include:

- **Turnbacks:** DDOT requires a turnback at both ends of the streetcar line in order to allow the trains to change direction. The vehicles are bi-directional; however, because they travel in mixed traffic, they need to change directions in order not to move in the opposite direction of traffic.
- **Maintenance Facility:** This facility will allow DDOT to fully service all streetcar vehicles operating in the corridor.
- **Power Supply:** The streetcars that DDOT has purchased are powered by overhead wires. In order to power the vehicles, DDOT needs to purchase wire, poles to support the wires, and three traction power substations.
- **Vehicles:** Operating the streetcar on 10 minute headways will require 4-5 vehicles in revenue service. DDOT currently owns three streetcars. One of these streetcars is required for



operations on the Anacostia line. DDOT will deploy the remaining two cars on the H St/Benning Rd line. DDOT intends to purchase 3 additional vehicles to operate in the H St/Benning Rd corridor.

DDOT used the following criteria to evaluate alternatives for each of the elements outlined below within future construction:

- Cost
- Transportation Effectiveness
- Community Impact

### **TURNBACK AND MAINTENANCE FACILITY ALTERNATIVES**

The selection of turnback options and maintenance facilities is inextricably linked. The selection of one turnback option may preclude the selection of a maintenance facility option. As a result, DDOT evaluated the turnback and maintenance options simultaneously.

#### **Maintenance Facility Options**

DDOT has identified three locations (Appendix B):

1. **Western Abutment H St Underpass:** This would place the maintenance facility underneath the H St Overpass. The facility could store 9 vehicles, and would provide adequate capacity to expand the line east of the river without requiring any additional storage. The eastern abutment was not considered as it is too small to accommodate more than two vehicles.
2. **Starburst Intersection:** This location would place a facility between 14th St, Florida Ave, and H St. This facility would accommodate 6 vehicles. Expanding the line east of the river would require the construction of another storage facility. This location would require the District to purchase or take multiple parcels and place a maintenance facility on a high-visibility retail corner directly across from the new plaza, a senior living facility and affordable housing.

3. **Spingarn High School:** The District owns land at Spingarn High School that could be used to store vehicles. This would require the tracks to cross a major arterial and occupy a large green space in the community adjacent to the historic Langston Golf Course.

### Turnback Options

#### *Western Termini*

DDOT evaluated six options for the western termini of the H St/Benning Rd streetcar line. See Appendix C for additional detail.

1. **Bridge Surface Route to Union Station:** This option was almost twice the cost of the other alternatives reviewed as it required significant construction on the bridge. It would also require DDOT to select Alternative 2 or 3 (Starburst or Spingarn) for the maintenance facility because it would not be feasible to place a maintenance facility in the garage or use the bridge abutment for a storage facility. While this option does connect to Union Station, it provides a much more circuitous path to the Metrorail station. Based on these factors, it does not compete on cost or community impact.
2. **2<sup>nd</sup> St South of H St:** This terminus option would require building a turnback in the middle of 2<sup>nd</sup> St NE. A mid-block turnback would require DDOT to shut down a block of 2<sup>nd</sup> St for three minutes every 10 minutes. This would impact the new development by Dreyfus, as well as Amtrak and PDC's access to their maintenance facility. It would also require DDOT to locate its maintenance facility at Starburst or Spingarn. Finally, it would not provide a direct connection to Union Station.
3. **2<sup>nd</sup> St North of H St:** This option would also require a mid-block turnback, however, DDOT would locate the turnback north of H St. This would require DDOT to shut down the block for three minutes every 10 minutes. This would disrupt traffic entering the Senate Square parking garage and the REA Building. Furthermore, it would restrict Amtrak and PDC's access to the H St Underpass. It would also require a maintenance facility at the Starburst or Spingarn. Finally, it would not provide a direct connection to Union Station.

4. **Loop on 2<sup>nd</sup> St, G St, and 3<sup>rd</sup> St:** This option would loop the streetcar around south on 2<sup>nd</sup> St to G St, east on G St to 3<sup>rd</sup>, and south on 3<sup>rd</sup> St to H St. This option would require a maintenance facility at the Starburst or Spingarn, adding both cost and community impact. In addition, this proposed loop would require major changes to the signaling of these intersections to accommodate the turning requirement of the streetcar. Finally, it would not provide a direct connection to Union Station.
5. **Loop on 2<sup>nd</sup> St, I St, and 3<sup>rd</sup> St:** This option would loop the streetcar around north on 2<sup>nd</sup> St to I St, east on I St to 3<sup>rd</sup> St, and south on 3<sup>rd</sup> St to H St. This option would require a maintenance facility at Starburst or Spingarn, adding both cost and community impact. In addition, this proposed loop would require major changes to the signaling of these intersections to accommodate the turning requirement of the streetcar. Finally, it would not provide a direct connection to Union Station.
6. **1<sup>st</sup> St NE and H St Underpass:** This terminus would involve cutting a portal through the H St Overpass and traveling under the Amtrak tracks through the H St Underpass and terminating with a stop at 1<sup>st</sup> St NE. This would provide District residents with a direct connection to the Union Station Metrorail station. It would also allow DDOT to store vehicles under the Western Bridge Abutment, completely screened from the community.

#### *EASTERN TERMINI*

DDOT evaluated four options for the western termini of the H St/Benning Rd streetcar line. See Appendix D for additional detail.

1. **Benning Rd Median:** This option would allow the vehicles to change direction in the median of Benning Rd. The road narrows at this point from four lanes in each direction to three lanes in each direction. This allows DDOT to utilize the median without impacting cars or other transit.
2. **Starburst Intersection:** This option places the eastern terminus at the Starburst intersection. This could be combined with a maintenance facility at Starburst. This

terminus would require the taking of multiple private parcels and would disrupt traffic at the Starburst intersection.

3. **Starburst Loop:** This alternative is a loop track on G St, 13<sup>th</sup> St, Maryland Ave, and 14<sup>th</sup> St. This alternative would require a maintenance facility at the Western Abutment or the Starburst intersection.
4. **Spingarn High School:** DDOT did not evaluate this alternative extensively due to traffic and community impact. This alternative would involve the streetcar tracks crossing the westbound travel lanes from the median into the yard adjacent to Spingarn High School.

Based on the screening of these alternatives, DDOT selected:

- **Maintenance Facility:** Option 1: Western Abutment H St Underpass
- **Western Terminus:** Option 6: 1<sup>st</sup> NE and H St Underpass
- **Eastern Terminus:** Option 1: Benning Rd Median

Appendix E provides a more detailed view of DDOT's decision-making criteria for maintenance facilities and turnbacks.

## **POWER SUPPLY**

Similar to the connection between turnbacks and maintenance facilities, the selection of vehicles and the power supply is also inextricably linked. Power supply can be provided to streetcars via overhead wires, on-board fuel or electricity storage, or in-ground power supply. Vehicles powered by overhead wires are the predominate vehicle used in the transit market. An evaluation of available propulsion systems by DDOT determined that while many promising technologies are emerging, the only propulsion technology proven in an operating environment similar to DC (in terms of weather and vehicle duty-cycle) utilizes overhead wires (Appendix F). Based on this analysis, the City Council's repeal of the ban on overhead wires, and the value of interoperability with the District's existing streetcars, DDOT has elected to operate vehicles on the H St/Benning Rd line with overhead wire power supply.

DDOT's preference is to minimize the amount of overhead power supply, and is designing the streetcar line in such a way as to minimize the size of the overhead wires. In order to ensure reliable power supply, most streetcar and light rail systems utilize two wires: a feeder wire and a power wire. The feeder wire ensures that if a segment of power wire fails that the entire line is not rendered inoperable. In most systems, this feeder line is above ground and placed over the power line. On H St/Benning Rd the feeder line will run under the track slab. This minimizes the appearance and number of overhead wires. Also, the use of a feeder line allows DDOT to minimize the size of the overhead power line.

The H St/Benning Rd line needs three substations to provide power to the streetcar. The substations must be evenly spaced along the line to minimize voltage drop between substations. Furthermore, the substations provide necessary redundancy; if one station fails, the streetcar will not be rendered inoperable. DDOT has identified two substation locations at both ends of the line that are owned by the District government and located well away from any other uses. The location on the western end of the line is under the Eastern Abutment of the H St Overpass. The location on the eastern end of the alignment is behind the library kiosk at the intersection of Benning Rd and 26<sup>th</sup> St NE. The mid-line substation is required at or near the intersection of H St and 13<sup>th</sup> St NE. DDOT evaluated a number of locations for this substation using the following criteria:

1. **Size:** Approximately 600 square feet of space are required for substation; 825 square feet are required if the station is located below ground.
2. **Operational Impact:** Accessibility for FEMS, as well as the potential impact on roadway or streetcar operations.
3. **Cost:** Sites owned by the District are presumed to be cheaper. Underground facilities are generally three times more expensive.
4. **Community Impact:** Sites were evaluated based on the potential impact to the H St NE retail corridor or adjacent residential uses.
5. **Land Use:** Potential sites were evaluated based on consistency with current land-use and development potential.

6. **Location:** A substation is needed approximately every mile along the streetcar route to provide a constant power supply. In this case, the ideal location is close to the streetcar route along H Street NE and between 12th and 14th Streets NE.
7. **Owner:** Sites that are not DC Government property would require a long and costly acquisition process and could delay progress for the entire H/Benning Streetcar project.
8. **Schedule:** DDOT is seeking a site that can be developed in time for a spring 2012 start of service.

DDOT evaluated five potential mid-line substation sites. Appendix G provides a detailed view on DDOT's decision-making process. Based on this analysis DDOT will construct an aboveground, mid-line substation on the SE corner of the intersection of 12<sup>th</sup> St NE and H St NE.

### VEHICLES

DDOT will operate streetcar service with bi-directional modern streetcars, approximately 66 feet long, eight feet wide and 11 feet tall. The middle section of the car contains a low-floor boarding area to improve rider access, level boarding, and double doors for faster loading and unloading. The car is electrically powered via overhead wires. Each vehicle can accommodate 30 seated passengers and an additional 138 standing passengers for a total of 168 passengers. (See Appendix H for the technical specifications of the vehicle).

Following the purchase of the vehicles required to operate the H St/Benning Rd line at 10 minute headways, DDOT will require manufacturers to produce vehicles that are capable of operating for up to 1 mile without overhead power supply. Future vehicle procurements will require the ability to operate for up to 1 mile without wires:

- Fully loaded with passengers
- In temperatures ranging from -15 to 110 degrees Fahrenheit
- At a 5% grade
- At an average speed of 5 miles per hour

DDOT issued an RFI to solicit information on the industry's ability to produce such a vehicle and will continue to engage the industry to ensure that it is fully up-to-date on the latest developments in vehicle technology (Appendix I). DDOT anticipates procuring vehicles that will be able to operate wirelessly once construction of the Benning Rd Extension begins.

### **CONNECTION TO UNION STATION**

The H St/Benning Rd Phase II will extend streetcar tracks from H St/3rd Street NE to H St/1st Street NE, providing a seamless connection between the first operable streetcar line and the Union Station Intermodal Terminal. The streetcar will initially connect to Union Station via the sidewalk on 1<sup>st</sup> St NE. DDOT, WMATA, and other key stakeholders have developed plans to connect the streetcar to Union Station via a pedestrian passageway. The 2009 *Union Station Intermodal Transit Center Feasibility Study* (see [www.ddot.dc.gov/unionstation](http://www.ddot.dc.gov/unionstation) and Appendix J) includes the creation of a new pedestrian walkway with a station lobby entrance from the H St/1<sup>st</sup> St NE (Union Station) streetcar stop.

The connection to Union Station will offer a transfer between the streetcar and multiple travel modes, including: the Metrorail Red Line, multiple Metrobus lines, DC Circulator bus, a commuter bicycle station, VRE and MARC commuter rail lines, Amtrak regional and long-distance lines, and various regional commuter and intercity bus services. DDOT recently submitted a TIGER 2 grant application to US DOT to fund this project (Appendix K).

### **MOVING FORWARD**

There are several outstanding action items that DDOT is working to resolve in order to complete construction on the H St/Benning Rd streetcar line:

## **H St BRIDGE RECONSTRUCTION**

The long-term plan for streetcar will take the tracks over the H St Bridge. This will provide a direct connection to the proposed Burnham Place development, the Intercity Bus Terminal, AMTRAK/VRE/MARC, Metrorail, Metrobus, Capital Bikeshare, and the DC Circulator. DDOT envisions a three stage implementation of the western terminus of the H St/Benning Rd streetcar line:

### ***Stage 1: 2012 – 2016***

DDOT will cut a portal through the eastern abutment of the H St Bridge. DDOT will operate revenue and non-revenue service through the H St Underpass. The streetcar line will terminate at a stop at 1<sup>st</sup> St NE and H St NE after passing through the H St Underpass. Trains will operate on 10 minute headways. This will create minimal conflict with ongoing use of the underpass (Appendix L).

### ***Stage 2: 2012***

DDOT will work with WMATA, USRC and Amtrak to improve access to Union Station. These improvements will improve circulation in the Metrorail station and enhance access to Amtrak, MARC and VRE. A 600 ft pedestrian passageway will connect directly to the streetcar platform. The improvements will also include high speed elevators to the new inter-city bus terminal and proposed Burnham Place development (Appendix M).

### ***Stage 3: 2016 and Beyond***

DDOT plans to begin reconstruction of the H St Bridge in 2015 (for planning purposes, DDOT assumes a two year construction period). As part of the reconstruction, DDOT will include streetcar tracks on the deck of the bridge. This will allow operation of the streetcar at street-level, providing service at the frontage of Burnham Place, and meeting DDOT's goal of improving access to retail residential and commercial development. It will also maintain the connections to Metrorail and commuter and intercity rail.



After reconstruction of the H St Bridge, DDOT will continue to utilize the H St Underpass tracks to access the maintenance facility.

DDOT anticipates constructing the streetcar tracks through the H St Underpass in such a way as to minimize disruption to streetcar service during bridge reconstruction. The Stage 1 tracks will converge from curb running tracks to center running tracks at 3<sup>rd</sup> Street NE. When the H St Bridge is reconstructed, DDOT will construct curb running tracks on the bridge deck. DDOT will construct switches at this juncture in anticipation of the reconstruction of the H St Bridge. This will allow DDOT to connect new and old tracks without interrupting service and facilitate a connection west to K St and downtown. Appendix N provides an illustration of the proposed phasing.

### **AMTRAK**

Amtrak must review and approve DDOT's designs. This is typical of any project adjacent to Amtrak facilities and requires DDOT and AMTRAK to sign a Project Engineering Agreement (PEA). DDOT and AMTRAK are currently negotiating a PEA.

### **POTOMAC DEVELOPMENT CORPORATION (PDC)**

Potomac Development Corporation asserts that it owns a portion of the H Street Underpass. DDOT approached PDC about negotiating an easement. To-date, these negotiations have not resulted in an amicable settlement. As a result, DDOT has elected to pursue a taking to secure an easement. The first step to acquiring such an easement is a title and appraisal. In the event that a taking is necessary, it will follow the standard taking process (Appendix O).

### **OVERHEAD WIRES**

In 1888 and 1889 Congress passed a ban on overhead wires. The Office of the Attorney General (OAG) opined (Appendix P) that the power to amend or repeal this law transferred to the District with Home Rule.

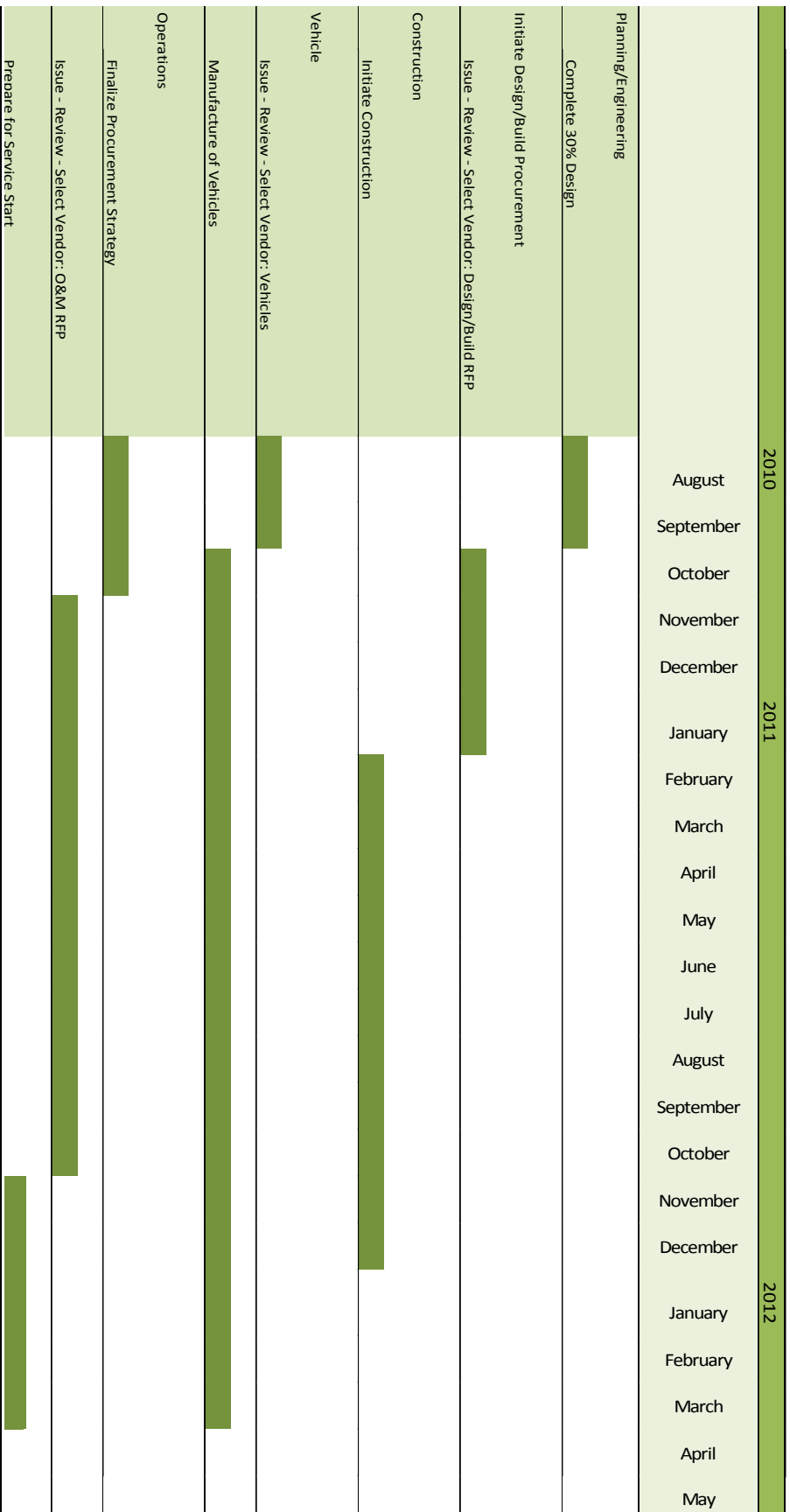
On July 19, 2010 the Mayor signed Emergency Legislation, following a 13-0 vote by the City Council repealing the ban via emergency legislation. On August 6, 2010 the Mayor signed temporary legislation permitting overhead wires in most areas of the City. This legislation also requires that DDOT procure cars that are capable of operating for up to a mile without overhead wires for all streetcar segments beyond H St/Benning Rd Phase II.

DDOT is also negotiating a Memorandum of Agreement (MOA) between the National Capital Planning Commission (NCPC) and the Mayor. The MOA restates the District's commitment to operate streetcars without overhead power supply in certain locations and clarifies the locations where DDOT will not install overhead wires. This MOA will clarify NCPC's advisory role in planning the streetcar system and will form an agreement with NCPC on where wires will be permitted and prohibited. However, any law passed by the City Council will provide the ultimate authority on overhead wires.

#### **SCHEDULE**

Delivering the H St/Benning Rd streetcar line by March 2012 will require concerted effort by DDOT, stakeholders and the City Council. The schedule below lays out the major tasks and milestones, by month, required to get the H St/Benning Rd streetcar line operational by 2012.

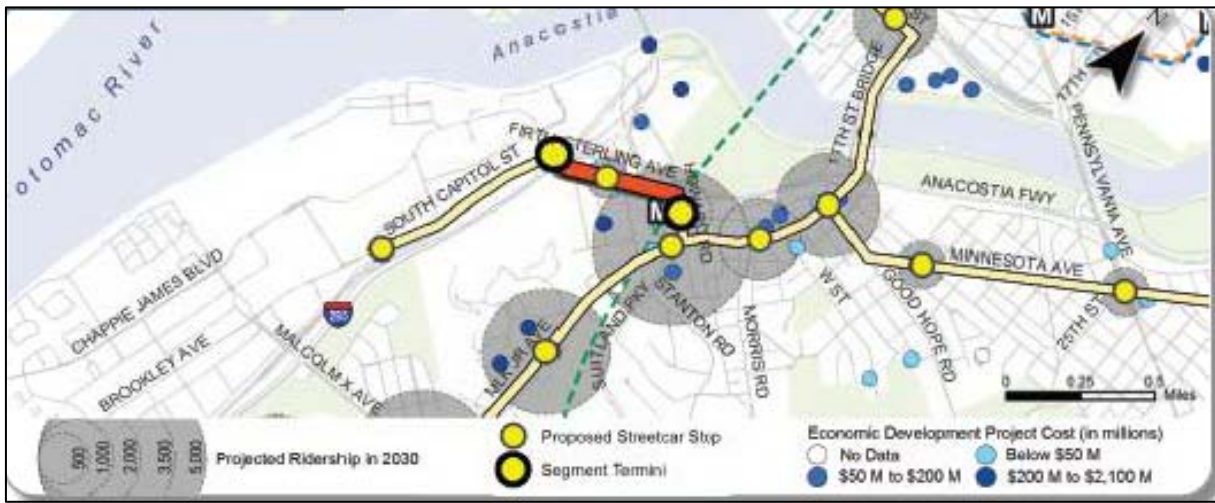
**Figure 1: H St/Benning Rd Phase II Schedule**



## ANACOSTIA INITIAL LINE SEGMENT

On February 17, 2009 DDOT initiated the construction of the 0.75 mile Anacostia Initial Line Segment (AILS), with the goal of providing an opportunity for the public to see and experience streetcar vehicles in operation, the original AILS project connects the Navy Annex with the Barry Farms Residential Area to Anacostia Metro Station. The project also connects the streetcar to the first maintenance and storage facility for the system east of the river.

**Figure 2: Anacostia Initial Line Segment**



### INTER-CONNECTIVITY WITH TRANSIT NODES

The Anacostia Initial Line Segment will connect the Navy Annex and Barry Farms Residential Area to the Anacostia Metro Station.

### TURNBACKS AND MAINTENANCE FACILITIES

Streetcars will turnaround at the Anacostia Metro station in the Howard Rd right-of-way and along the frontage of South Capitol St.

The project includes a maintenance and storage facility located at 2750 South Capitol Street, just south of the NSF Anacostia. This location offers the opportunity to expand to service other east of the river streetcar lines.

### **VEHICLES**

The Anacostia Initial Line Segment will require one streetcar for revenue service. DDOT will operate the service with bi-directional modern vehicles. The car will be electrically powered via overhead wires, and will be interoperable with the vehicles on the H St/Benning Rd line.

### **FUTURE PLANNING AND CONSTRUCTION**

The DC Transit Future System Plan, April 2010 lays the foundation for future planning exercises in order to advance future streetcar segments through the project development process. The system plan identified the preferred mode and corridors to be served. Additional planning is critical to ensure the District maximizes the return on its investment in streetcar. Maximizing the return on investment will require DDOT to revisit every streetcar extension to determine the optimal investment. This may result in slight changes to the alignments, extensions, hours of operations, and frequencies, as is typical in the project development process.

### **OFFICE OF PLANNING LAND-USE STUDY**

Currently the Office of Planning, in conjunction with DDOT, is conducting a land-use study. The purpose of this study is twofold. First it will evaluate the impact of streetcar and access to jobs as well as the impact on land values. Secondly, it will identify alternative alignments for future streetcar segments. This study is not revisiting the system plan but instead will provide alternative alignments which will influence our future planning and engineering processes. The alternatives will be incorporated into future planning and project development. For example, DDOT is currently studying an extension of the Anacostia line. The OP study will help DDOT identify alternatives for this extension.

### **INTER-AGENCY LIVABILITY WORK GROUP (ILWG)**

In DDOT's continued effort to plan on many different levels, DDOT has initiated an inter-agency coordination effort with OP, DMPED, DHCD, DCHA, DOES, DPR, DCPS, DCRA and WMATA. The group will ensure that District agencies coordinate investments along proposed streetcar lines.

### **INTER-AGENCY PUBLIC SAFETY AND EMERGENCY RESPONSE GROUP (IPSERG)**

Re-launching streetcar service in the District will require developing a variety of standard operating procedures for ensuring the safe delivery of service. For example, the District will need to develop policies, fines, and enforcement authority for vehicles that block streetcar lanes. DDOT and its sister agencies will need to develop security protocols to deal with revenue collection and fare evasion. Some streetcar tracks will have homeland security implications. Fire/EMS will need the ability to de-energize tracks and wires to respond to emergencies. Streetcar lines will cross multiple police districts, which will necessitate a strategy for how to handle police activities across district boundaries. DDOT has initiated a working group with MPD, FEMS, and HSEMA to address these issues.

### **PROGRAM MANAGEMENT TEAM**

DDOT recently announced the selection of our Program Management Team for DC Streetcar. The team will provide a full range of services to ensure the successful design, construction, and operation of the streetcar system across the District of Columbia. The team is comprised of several firms led by HDR Engineering and Shiels Oblatz Johnsen, Inc.

The Progressive Transportation Services Administration (PTSA) within DDOT will be managing the Program Management contract. PTSA will begin working with the Program Management Team immediately on the following tasks:

- National Environmental Policy Act (NEPA) compliance
- Operator selection
- Vehicle procurement
- Financial plan

## Governance

DDOT has also assembled a staff of in-house experts to work on the Streetcar project, including Chief Engineer Ronaldo “Nick” Nicholson, Chief Engineer for Rail Idefonso Burgos, and PTSA Deputy Director Ralph Burns (see Appendix Q for resumes).

The selected team provides specialized experience and capabilities in program management, planning, operations, financial planning, legal support, strategic and project communications, governance and management, and procurement. The selected team is comprised of the following:

**HDR Engineering, Inc.** has clients around the nation and has been successful in delivering Small Starts and New Starts projects from initial planning through final design and construction. Most recently, HDR secured federal TIGER funds for the construction of streetcar projects in Tucson and New Orleans, where they are also providing planning, NEPA, design, preliminary engineering, and program management services. David Vozzolo of HDR will serve as the Program Director for the project.

**Shiels Oblatz Johnsen** who has successfully delivered on two major streetcar projects in Portland and Seattle, managing all aspects of the projects from planning, design and construction oversight, finance, technical issues, intergovernmental agreements, operations, safety, legal and strategic communications. Rick Gustafson of Shiels Oblatz Johnsen will serve as the Project Principal.

**ZGF Architects LLP** offers services in planning, urban design, architecture and interior design. Nationally recognized for their transportation and urban design projects; one of their most notable projects is the planning and design of the Portland, Oregon streetcar project and the formation of a public/private consortium formed to design, build and operate the Portland system.

**Jeffrey A. Parker (JPA)** is a consultant firm that has deep expertise in traditional US public finance tools, complex procurements and Public-Private Partnerships (“PPP”). Having worked extensively on mass transit, highways, and intermodal projects, JPA has experience with all components of transportation funding: state and local grants, intergovernmental funding agreements and compacts, dedicated taxes, user fees, ancillary revenue, federal grants and credit programs, municipal, non-profit corporation and conduit debt, and financing via PPP.

Other members of the core team include **LTK Engineering Services Inc** (engineering), **Ball Janik LLP** (government relations), **Andrea Ferster Law Offices** (legal), and **Collaborative Strategies LLC** (communications). These team members are based in the District of Columbia or have offices in the city.

#### **PUBLIC OUTREACH AND COMMUNICATIONS STRATEGY**

DDOT has taken several avenues to foster community input as well as community outreach. For example, DDOT's construction manager hired a full-time community liaison to keep businesses and residents abreast of the current road reconstruction project. Also during the design and construction of the current streetcar line DDOT conducted several public meetings to brief the community on the proposed project. In addition, it has held two community meetings to discuss specific elements of the power supply for the streetcar.

As DDOT continues to explore subsequent extensions, a coordinated public outreach and communications approach will be necessary. DDOT will achieve this effort by assigning a community liaison during the construction process and will provide monthly progress reports to the community and political officials. This coordinated effort will include frequent attendance at community meetings to seek input from District residents. DDOT will also host regular "Open House" style meeting to update the community on its progress on segments impacting the ward(s).

Finally, as DDOT conducts detailed planning for future lines/extensions, starting with the Anacostia Extension, it will work closely with the community to ensure that residents and businesses are aware of and participating in the planning process. The community is best qualified to identify its transportation issues, and this engagement is critical to delivering a successful project.

#### **CONSTRAINED LONG-RANGE PLAN/TRANSPORTATION IMPROVEMENT PROGRAM**

DDOT has incorporated portions of the streetcar plan into the region's primary transportation planning documents, the Constrained Long-Range Plan (CLRP) and the Transportation Improvement Program (TIP). The TIP documents DDOT's transportation investments over the next six years. The District has included the two lines currently under construction and planning for two extensions (to Benning Rd from H St NE and to the 11<sup>th</sup> St Bridge in Anacostia), as well as the K St Centerway. The CLRP includes the

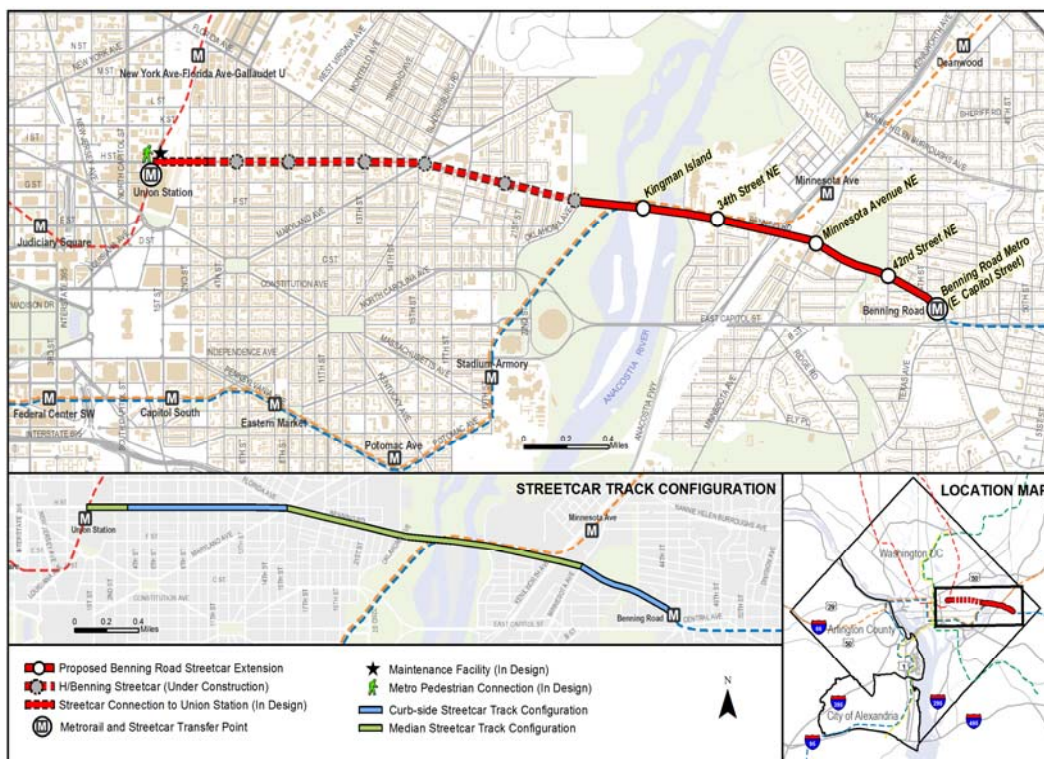


construction and operations of the two lines currently under construction. As financial planning on the system continues, additional portions of the network will be put in these planning documents.

### **BENNING RD EXTENSION: UNION STATION TO THE BENNING RD METRO STATION**

The Benning Road Streetcar Extension project is a 1.95 mile surface fixed guideway transit line that includes electrically powered streetcar vehicles operating along tracks located within the existing travel lanes. The project will serve as an extension to the H Street/Benning Road Streetcar line. The extension project is located along Benning Road NE from Oklahoma Ave to East Capitol Street.

**Figure 3. Benning Rd Extension Project Location and Alignment**



### **Purpose and Need**

This extension will provide non-transfer service from Benning Rd Metro Station to Union Station. It will provide high-capacity, high-quality and low cost transit service to District residents. A transit investment

of this magnitude will catalyze economic development in an emerging commercial and residential corridor. Metro will reach or exceed its capacity in the near future; this extension will provide core capacity relief on the Metro system.

The transit corridor served by this project is in need of additional transportation investment. There is limited access to Metrorail; Metrobus currently serves 18,000 passengers a day and is experiencing severe overcrowding in the corridor. The DC Streetcar will relieve crowding on Metrobus and Metrorail, connect activity centers, and facilitate transfers between modes. The corridor also serves an area that the District has targeted for commercial and residential redevelopment. District-wide and neighborhood plans have identified the need for investment in higher-capacity fixed-guideway transit in this area to support dense, mixed-use development. The corridor also contains two emerging but still fragile commercial nodes, at Minnesota Avenue and at East Capitol Street.

DDOT submitted an Urban Circulator Grant Application for this extension. DDOT has provided a copy of that grant application, which provides greater detail on the Benning Rd Extension (Appendix R).

### **Inter-Connectivity with Existing Transit Nodes**

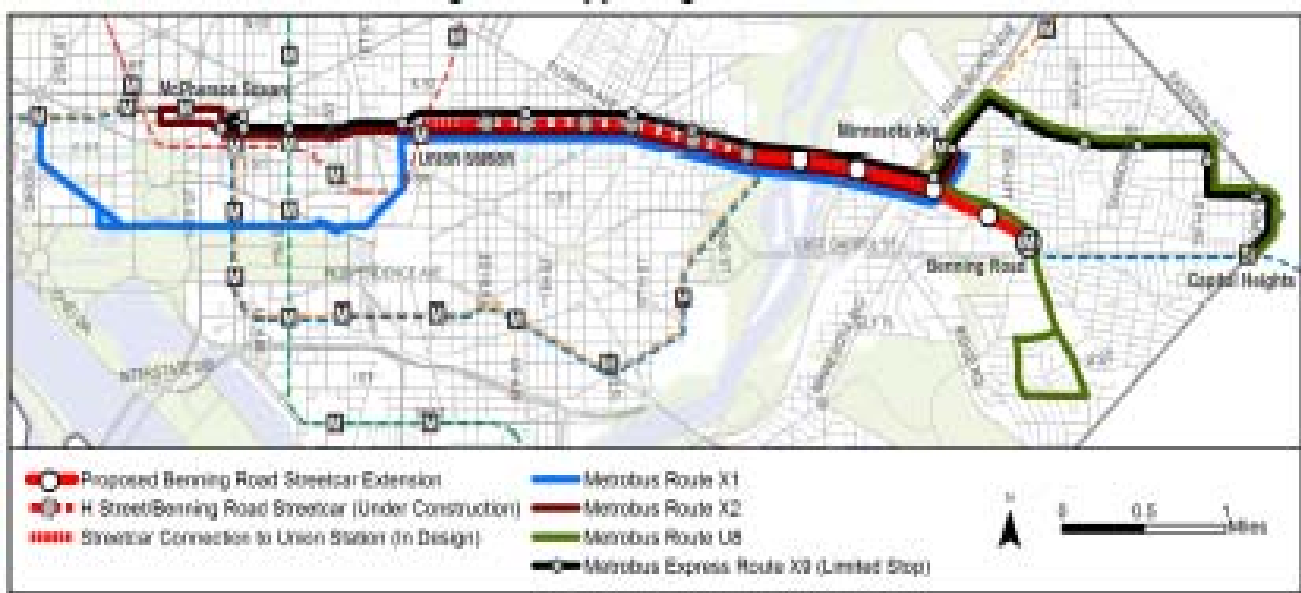
The Metrobus X1, X2 and X3 routes currently operate between the Minnesota Avenue Metrorail station on its eastern end and three western terminals in northwest DC. These routes operate primarily via Minnesota Ave, Benning Rd and H St. Ridership on this line is the fourth highest in DC as a result of the population in the service area, the popularity of the destinations and number of transfer points along the route. Existing ridership totals almost 14,000 passengers per day along these lines, and crowding has been a major issue. The Metrobus U8 operates between the Capitol Heights Metrorail Station and the Benning Heights neighborhood including the portion of Benning Rd between Minnesota Ave and East Capitol St. The route carries over 4,000 daily riders and connects to the Metrorail system at the Capitol Heights, Minnesota Ave and Benning Rd Stations.

In 2009 WMATA completed the Benning Rd- H St Metrobus Restructuring Study for Routes X1, X2 and X3 to address crowding and other issues along the line. WMATA and DDOT are implementing the first phase of the study recommendations in 2010, and the remaining recommendations will be in place prior to streetcar service being initiated in this corridor. Planned service changes include:

- Increased frequency of service on Metrobus X2
- Articulated buses on X2
- New X9 limited stop service Elimination of the X3 bus
- X1 route extension and hours of service expansion

No changes are currently planned for Metrobus route U8. The Benning Rd Streetcar Extension will augment, not replace, these bus services.

**Figure 4: Planned Bus Improvements in H St/Benning Rd Corridor**



**MAINTENANCE FACILITY**

All vehicles will use the proposed maintenance and storage facility that is currently in design as part of the H St/ Benning Rd Phase II Streetcar Project.

## **VEHICLES**

DDOT will operate the service with bi-directional modern streetcars approximately 66 feet long, eight feet wide and 11ft tall. The middle section of the car contains a low-floor boarding area to improve rider access, an extendible wheelchair ramp, and double doors for faster loading and unloading. This extension will utilize vehicles capable of operating for up to 1 mile without overhead wires.

## **ANACOSTIA EXTENSION: ANACOSTIA METRO TO 11TH ST BRIDGE**

The Anacostia Extension (Figure 4) is a part of the DC Streetcar System outlined in the DC's Transit System Plan (2010). This extension will link the current Anacostia Initial Line Segment to the to the 11<sup>th</sup> St Bridge, which will ultimately allow (in future extensions) the streetcar to cross the Anacostia River to the developing Navy Yard/ Near Southeast activity center and Capitol Hill.

## **PURPOSE AND NEED**

The purpose of the proposed Anacostia Extension project is to provide high-capacity and high quality transit service to District residents, employees and visitors and invest in infrastructure that will catalyze economic development in an emerging commercial and residential corridor.

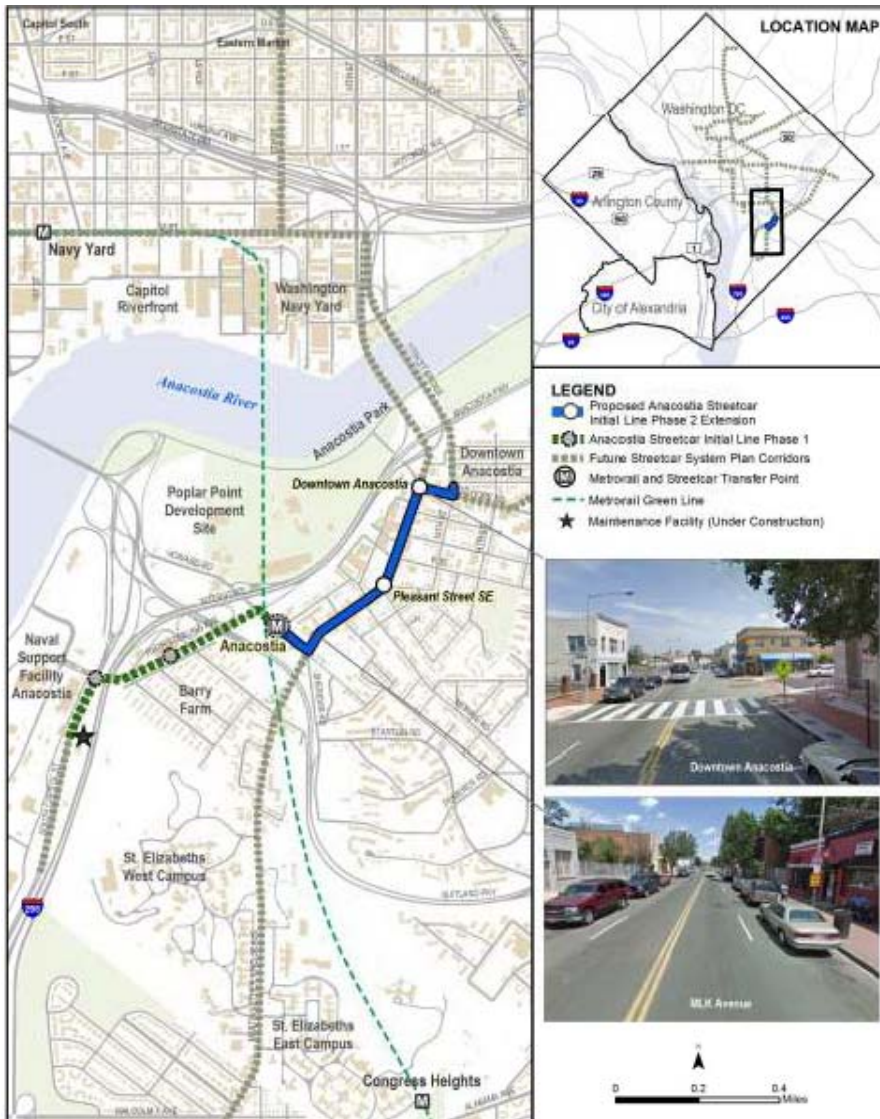
The affected corridor will serve an economically distressed and transit-dependent community, providing access to an important community center for government services, local business, recreation and transit transfers. Based on DC Office of Planning and US Census data, the project corridor has substantial concentrations of low-income and transit-dependent households, with approximately 45.6 percent of the households within ¼ of a mile having incomes below \$35,000, and 51.8 percent of households have no access to a car.

The extension to the Anacostia Initial Line Segment will:

- Improve connectivity between the Anacostia Metro station and Downtown Anacostia
- Connect to the Naval Annex and Barry Farms neighborhood to Downtown Anacostia
- Improve access and connectivity for residents and visitors to the Anacostia business and historic district
- Promote sustainable transit services, infrastructure, and development patterns.

DDOT will initiate a NEPA process in November 2010 to determine the optimal alignment for the Anacostia Extension. The District has submitted a TIGER 2 grant application for this project (Appendix S).

**Figure 4: Anacostia Streetcar Initial Line Phase 2 Extension Project Location**



**INTER-CONNECTIVITY WITH EXISTING TRANSIT NODES**

The Anacostia Extension will connect the streetcar with the “90’s.” one of the highest ridership in the District, with 14,900 riders per day. It will also connect to the 11<sup>th</sup> St Bridge which is critical to connecting the eastern and western sides of the Anacostia River. Finally, it will provide a connection between the Anacostia Metro and downtown Anacostia.

## **TURNBACKS AND MAINTENANCE FACILITIES**

The streetcar will have a southern terminus in the frontage of South Capitol St adjacent to the AILS maintenance facility. The northern terminus will be identified as part of the NEPA process.

The project will use the maintenance and storage facility that will be located at 2750 South Capitol Street, just south of the NSF Anacostia. This facility is currently being designed as part of the Anacostia Streetcar Phase 1 project and will serve five streetcar vehicles.

## **VEHICLES**

The project will require the procurement of two streetcar vehicles. DOT will require manufacturers to produce vehicles that are capable of operating for up to 1 mile without wires.

## **K ST CENTERWAY**

The proposed streetcar networks spine forms on K St. It serves the region's largest concentration of jobs and provides connections to every Metro line in the region. DDOT has developed plans for a dedicated transitway in the center of K St. This transitway would service both buses and streetcars, and would dramatically improve access to jobs in the downtown core. DDOT applied for a Livability Grant in July 2010 (Appendix T) that would provide federal funds to conduct an alternatives analysis for the K St Centerway. This alternatives analysis is the first step toward obtaining a discretionary grant from the Federal Transit Administration.

## **STREETCAR OPERATIONS**

DDOT has developed preliminary operations plans. Detailed operations planning will commence when DDOT selects an operator for the streetcar.

### **HOURS OF OPERATION AND FREQUENCY**

The streetcar service will operate seven days per week between the following times:

- Monday through Thursday from 6:00 am to 12:00 am (midnight)
- Friday from 6:00 am to 2:00 am
- Saturday from 8:00 am to 2:00 am
- Sunday from 8:00 am to 10:00 pm

The service will operate on 10-minute headways during peak and off-peak periods. The Anacostia line will operate on 15 minute headways until it is extended past to the 11<sup>th</sup> St Bridge. This is due to the relatively limited demand for service in the existing corridor. Ten-minute headways will match that of the DC Circulator. DDOT anticipates operating this level of service on all streetcar alignments. In those areas with greater peak period demand DDOT will augment streetcar service with Metrobus and Circulator.

The table below shows the assumptions used to determine the number of vehicles required to meet 10 minute headways. The transit industry typically maintains a spare ratio of 20%. This means that if a service requires five vehicles to provide peak service that it maintain 1 vehicle as a spare. This spare is utilized if a vehicle is rendered inoperable. Regardless of the number of vehicles required for peak service, a minimum of one spare is required to maintain reliable operations. The table below shows the vehicle requirements to operate streetcar on the two lines under construction. It is important to highlight, that if the streetcar averages between 7 to 10.5 miles per hour then DDOT can provide 10 minute headways with a fleet of five vehicles on H St. If it averages 10 miles per hour on the Anacostia line it can maintain 15 minute headways. In order to meet this service standard DDOT needs a minimum



of six vehicles, ideally seven, in its fleet. Figure 5 shows the vehicle requirements for the two segments currently under construction.

**Figure 5: Vehicle Requirements**

	MPH	Layover Time	Total Travel Time	Frequency	Peak Vehicle Requirement	Spare	Total Fleet
<b>H St/Benning Rd</b>							
High	10.5	6	29	10	3	1	4
Low	7.0	6	40	10	5	1	6
<b>Anacostia</b>							
Minimum	10.0	6	14	15	1	1	2
<b>Total Fleet Requirement<sup>1</sup></b>					<b>5</b>	<b>2</b>	<b>7</b>

1. If sufficient funding is not available to meet these vehicle requirements, DDOT will utilize 1 spare vehicle and require the vendor to use it on both Anacostia and H St/Benning Rd. This will raise operating costs by small amount.

**FARE POLICY/COLLECTION**

One of the hallmarks of the Circulator brand, and a feature DDOT will transfer to the streetcar is its simplicity. As such, DDOT will maintain a simple fare structure with a low price for all patrons. This means that DDOT will honor Metrobus passes, but will not issue its own passes. Figure 6 shows the fare structure proposed for the DC Streetcar.

**Figure 6: Proposed Fare Structure**

	Cost to Board Circulator or Streetcar
Cash	\$ 1.00
Transfers	Free with Smartrip
1-Day Pass	\$ 3.00
Metrobus Passes	Free

DDOT anticipates using a combination of on-board and off-board fare collection, as well as a proof of payment system. DDOT currently sells 1-day passes through its multi-space parking meters. DDOT

anticipates using these devices (or a similar device) as the method of off-board fare payment. DDOT also plans to utilize Smartrip. DDOT strives to eliminate cash on the vehicle. This will minimize the cost of collecting revenue, potential conflicts with the operator, and allow the operator to focus on the road. It will also speed up operations by allowing customers to board and alight from all doors. Most light rail and streetcar systems in the United States utilize a proof of payment system. DDOT is working with MPD to establish an appropriate enforcement protocol.

**STOPS**

Streetcar stops will consist of raised platforms to allow level boarding, fare vending kiosks, and electronic signage with real-time arrival information. All streetcar stops will meet ADA requirements. Level boarding will facilitate boarding for those customers with mobility impairments, improving overall operations. DDOT will utilize two basic streetcar stop formats: center boarding and curbside. Streetcar center platforms dimensions are approximately 72 feet long by 16 feet wide. Curbside platform dimensions will be approximately 72 feet long and 12 feet wide.

**PROJECTED RIDERSHIP**

DDOT estimated ridership for two time periods: opening day and 2030. Ridership forecasts were developed using the MWCOG land use and travel demand model. Figure 7 shows the projected ridership.

**Figure 7: Projected Ridership Per Day**

	Opening Year	2030
H St/Benning Rd	1,500	13,900
Anacostia Initial Line Segment	50	150
Benning Extension	4,300	6,200
Anacostia Extension	500	3,200

The Anacostia Initial Line Segment (AILS) has low ridership potential. However, it is a critical link for streetcar service east of the river. The AILS will provide for maintenance and storage facilities east of

the river in areas that are screened from adjacent residential and community uses. Without this segment, DDOT cannot operate streetcar in Anacostia or the SE/SW waterfront.

### **Operator**

DDOT anticipates contracting operations to a 3<sup>rd</sup> party. This is an increasingly common practice in the United States and is widely employed by international transit operators. This will not preclude public sector providers, such as WMATA, from bidding on this contract. DDOT is currently evaluating different contracting strategies. Specifically, DDOT will evaluate its options with regard to:

Contract Duration – Contracted operations for transit service run from 1 year to as long as 30 years. The Circulator contract is 3 years with 2 1-year options. DDOT will evaluate the contract length to minimize cost and maximize service quality. The duration of the contract will affect the pricing and will impact the method of delivering future extensions.

Bundled Contract (Circulator and Streetcar) – The initial streetcar contract will be under \$10M per year. This may not generate sufficient vendor interest to provide strong competition and obtain favorable pricing. Bundling with the Circulator contract will increase the size of the contract, increasing industry response and the overall level of competition and lowering costs.

Contractor Provided Equipment – Due to elimination reduction of \$13M in funding from the proposed FY10 Emergency BSA, DDOT may need the contractor to provide some parts and equipment as a part of its operating contract in order to defray capital costs. This will lower capital requirements but increase operating costs.

DDOT will evaluate these and other issues to derive an optimal procurement strategy. This contract will require council's approval and will be subject to First Source requirements.

DDOT anticipates needing 12 months to initiate and award this procurement.

## **LABOR**

DDOT anticipates contract operating the Streetcar. DDOT and the selected contractor will comply with local and federal law. This relates not only to wages but also to First Source requirements. All DC Streetcar related jobs will be new and thus every job subject to First Source requirements. This contrasts with current WMATA operations, in which the District cannot mandate hiring of District residents.

Long-term the streetcar will create ongoing operations employment. DDOT estimates that the first two streetcar lines will generate approximately 30 full-time, permanent jobs. When fully constructed, DDOT estimates that operating and maintaining the streetcar will create 450 to 500 full-time, permanent jobs. If DDOT bundles streetcar and Circulator operations it will increase the number of First Source-eligible jobs by approximately 170 full-time positions.

## **SAFETY PLAN**

Under the guidelines set forth under 49 CFR Part 659, Rail Fixed Guideway Systems; State Safety Oversight, as well as all applicable federal, state and local laws and regulations, DDOT is creating a System Safety Program Plan (SSPP) to comply with said guidelines as well as those created by the State Safety Oversight Agency (SSOA).

Specifically, the plan:

- States DC Streetcar's commitment and philosophy to actively sustain safe transit operations.
- Establishes and manages safety activities intended to serve as countermeasures in minimizing risk and loss of resources and maximize the safety of the public.
- Integrates the safety and security function throughout the DC Streetcar organizational structure.
- Defines organizational safety and security responsibilities.
- Provides for the documentation and verification of safety and security activities.

- Evaluates activities to assure continued development and advancement of safety activities.

Development and preparation of the SSPP in accordance with the:

- Federal Transit Administration (FTA) regulation; Rail Fixed Guideway Systems; State Safety Oversight, 49 CFR Part 659; and other federal and jurisdictional guidelines.

DDOT currently has drafted a State Safety plan for the streetcar (Appendix U). DDOT will need to finalize this plan prior to initiating operations. DDOT is also actively recruiting a State Safety Oversight Officer.

In addition to DDOT's creation of a safety plan that will meet State Safety Oversight requirements, as well as all applicable federal, state and local laws and regulations DDOT will implement an Educational Plan as well. DDOT envisions a three-pronged process that will assist in getting the word out to the public regarding streetcar safety. One is using FRA's Operation Lifesaver Program that has a component to deal with streetcar and light rail safety. This will be geared primarily for school-age children. The second is developing a PSA, similar to that which was implemented in Phoenix for adults; it speaks to how to drive with the streetcar in mixed traffic. The last prong, and the one that will require an inter-agency effort in conjunction with the DMV is to add a component to DMV's literature and driver testing that deals specifically with streetcar, (i.e., keeping a safe distance from the vehicle, understanding the different type of traffic signal for transit, etc.). These educational components will be essential in ensuring a comprehensive safety plan.

## **FUNDING**

Funding for the streetcar lines will require both operating and capital dollars. Capital dollars are required to purchase additional vehicles and complete construction on the streetcar tracks and systems.

### **CAPITAL**

#### ***H St/ BENNING RD***

DDOT initially budgeted the completion of the H St/Benning Rd line at \$63M. This funding covered the cost of completing construction and the purchase of 6 additional streetcars. The Council approved budget for the project is \$50M.

DDOT estimates the costs for completing the H St/Benning Rd project and purchasing 3 vehicles will cost \$50M. This will result in longer headways (due to having fewer vehicles on H St/Benning Rd), but will allow DDOT to deliver streetcar service within budget.

The current funding level is the bare minimum required to initiate streetcar service. Significant risk remains in construction cost, the cost of procuring vehicles, and securing right-of-way. In the event that actual costs exceed estimates, DDOT may require additional funds to implement the level of service currently envisioned.

Specific cost estimates for items such as right-of-way and vehicles are not included in specific line-items, as this might weaken DDOT's negotiating position.

#### ***BENNING RD AND ANACOSTIA EXTENSION***

The extension to the Benning Rd Metro station is estimated to cost approximately \$77M. The extension from the Anacostia Metro station to the 11<sup>th</sup> St. Bridge is anticipated to cost \$36M. DDOT has identified a funding source to pay for this extension. This brings the total cost for both extensions to \$113M.

Currently the District spends \$10.328M annually to WMATA to pay for debt service on its Series 2003 bonds. This debt service is used to pay for a borrowing that funded the construction of the original Metrorail system. This debt service will expire over a 4-year period. DDOT proposes to utilize this revenue stream to fund the construction of the Benning Rd Extension and the Anacostia Extension. Figure 8 shows the amount and timing of this debt service.

**Figure 8: WMATA Debt Service**

**WMATA Debt**

	FY2011	FY2012	FY2013	FY2014	FY2015
Principal	\$ 24,160,000	\$ 25,275,000	\$ 15,140,000	\$ 11,350,000	\$ -
Interest	\$ 3,317,156	\$ 2,201,650	\$ 1,057,900	\$ 425,750	\$ -
Total	\$ 27,477,156	\$ 27,476,650	\$ 16,197,900	\$ 11,775,750	\$ -

DC Share of Debt Service 38%

**DC Share of WMATA Debt Service**

Principal	\$ 9,081,735	\$ 9,500,863	\$ 5,691,120	\$ 4,266,461	\$ -
Interest	\$ 1,246,918	\$ 827,599	\$ 397,664	\$ 160,039	\$ -
Total	\$ 10,328,652	\$ 10,328,462	\$ 6,088,784	\$ 4,426,500	\$ -

**Revenue Available for Borrowing (Δ from Maximum Payment)**

	\$ -	\$ 190	\$ 4,239,868	\$ 5,902,152	\$ 10,328,652
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Utilizing this revenue stream could generate up to \$180M, assuming the District’s current borrowing rates. This capital funding would not require any reduction in an existing capital project or operating program at WMATA or in the District government and would not increase the overall debt service paid by the District of Columbia. Furthermore, because the debt service will be paid through 2014, it cannot solve District operating shortfalls in FY11 through FY14. This debt was issued by WMATA, and the District’s portion is subject to annual appropriation. Therefore, the debt service does not currently count against the District’s debt cap.

The District is currently pursuing federal sources of funding for both of these extensions. For the Benning Rd Extension it is requesting \$73.4M in federal funds through the District’s annual appropriation request of the federal Office of Management and Budget (Appendix V). For the Anacostia





**Figure 10: Capital Cost Elements for Benning and Anacostia Extensions**

Capital Cost Elements	FY12	FY13	FY14	Total
<b>Benning Rd Extension<sup>1</sup></b>				
Guideway & Track Elements		\$ 6.8	\$ 6.7	\$ 13.4
Station Stops/Terminals		\$ 1.9	\$ 1.9	\$ 3.8
Yards/Shops/Support Facilities		\$ 0.1	\$ 0.1	\$ 0.2
Sitework & Special Conditions		\$ 3.1	\$ 3.0	\$ 6.1
Systems		\$ 8.4	\$ 8.2	\$ 16.6
Right-of-Way		\$ -	\$ -	\$ -
Vehicles <sup>2</sup>		\$ 6.0	\$ 6.0	\$ 11.9
Professional Services		\$ 6.3	\$ 6.2	\$ 12.4
Contingency		\$ 6.1	\$ 6.0	\$ 12.0
Finance		\$ 0.3	\$ 0.3	\$ 0.6
<b>Total</b>	<b>\$ -</b>	<b>\$ 38.8</b>	<b>\$ 38.3</b>	<b>\$ 77.1</b>
<b>Anacostia Extension</b>				
Guideway & Track Elements	\$ 2.2	\$ 2.2		\$ 4.4
Station Stops/Terminals	\$ 0.5	\$ 0.5		\$ 1.0
Yards/Shops/Support Facilities	\$ 0.0	\$ 0.0		\$ 0.0
Sitework & Special Conditions	\$ 1.5	\$ 1.5		\$ 3.0
Systems	\$ 2.8	\$ 2.8		\$ 5.7
Right-of-Way	\$ -	\$ -		\$ -
Vehicles	\$ 6.0	\$ 6.0		\$ 11.9
Professional Services	\$ 2.7	\$ 2.7		\$ 5.4
Contingency	\$ 2.2	\$ 2.2		\$ 4.3
Finance	\$ 0.1	\$ 0.1		\$ 0.3
<b>Total</b>	<b>\$ 18.0</b>	<b>\$ 18.0</b>		<b>\$ 36.1</b>

1. The schedule for this extension has been revised to reflect that DDOT did not win an Urban Circulator Grant and to reflect the District's request to the Office of Management and Budget.
2. The cost for vehicles was increased from the Urban Circulator Grant application (February 2010) to reflect DDOT's commitment to procure cars that can operate without wires.

**OPERATING**

DDOT has budgeted the cost of providing streetcar service at \$216.81 per hour of service. This is a relatively conservative estimate based on an average of several streetcar systems. The transit industry has experienced a wide range of operating costs from a low of approximately \$140 per hour to as much as \$300 per hour. Costs are driven by a number of factors, including: local economic conditions,

operating parameters, and administrative overhead. For the purposes of budgeting DDOT selected a relatively conservative cost.

DDOT believes that by managing the streetcar in a manner similar to the Circulator that the actual cost will be much lower, on par with Metrobus. WMATA’s cost per hour for Metrobus is roughly \$130 per hour (a relatively standard cost in the transit industry), while the Circulator is roughly \$80 per hour – over 35% less expensive. Assuming the same cost savings, Streetcar would cost roughly the same as Metrobus but provide higher capacity and a higher quality ride.

DDOT anticipates initiating streetcar operations late-March 2012, thus not incurring a full year of operating costs. Figure 11 shows the anticipated operating subsidy for the first ½ year and first full year of operations.

**Figure 11: Anticipated Operating Subsidy**

	1/2 Year	Full Year
H St/Benning Rd	\$ 1.80	\$ 3.60
Anacostia Initial Line Segment	\$ 0.70	\$ 1.50
Benning Extension	\$ 0.90	\$ 1.80
Anacostia Extension	\$ 0.50	\$ 1.00

Appendix W provides a detailed 5-year projection of operating cost, revenue and subsidy for each segment.

DDOT assumes a cost increase of 3.0% per year (based on the current DC Circulator contract). DDOT based revenue projections on the opening year ridership of the H St/Benning Rd. Growth in ridership assumed a straight line increase based on 2030 ridership projections produced in the April 2010 system plan.

. DDOT does not recommend reducing bus service on the H St/Benning Rd line or in the Anacostia Initial Line Segment. Neither segment fully duplicates existing bus routes. Furthermore, the existing bus service on H St and Benning Rd is overcrowded. As the system is expanded DDOT will reduce some bus service in order to match supply of service with demand. However, the level of transit service (overall transit service and vehicles) will increase as streetcars are added to corridors.

## **GOVERNANCE**

As the streetcar system develops the District will need to determine the appropriate governance structure for the DC Streetcar. There are a number of different issues that need to be addressed when evaluating governance, ranging from service issues (hours of operations, frequency, etc), fares, construction phasing, etc. The transit industry offers a number of different governance models (Appendix X). Based on a review of current legislation, the District will need to establish a governance structure and operating authority for the DC Streetcar prior to the onset of operations.

### **DDOT ESTABLISHMENT ACT**

The DDOT establishment act permits DDOT to “Develop paratransit systems, water taxis, tour bus support services, light rail systems and other transportation services to provide for safe and efficient movement of persons throughout the city;” However, the Office of the Attorney General opined that this authority is not sufficient to operate streetcar (Appendix Y).

### **DC TRANSIT BOARD ESTABLISHMENT ACT**

Councilmember Graham recognized the need for a governance structure for the DC Streetcar and introduced a bill on December 15, 2009 that would create a DC Transit Board.

In response to these requirements, DDOT will convene a governance taskforce composed of private sector, public sector, industry, and community leaders to propose a governance structure for the DC Streetcar. DDOT will start this work in November and complete its work prior to operation of the Streetcar