

Columbia Pike Streetcar Project

Environmental Documentation and Preliminary Design Draft Scope of Work

Revised February 27, 2009

I. Project Title and Identification

Project Title: Columbia Pike Streetcar Environmental Documentation and Preliminary Design

Project No:

Requisition No:

II. Project Purpose

The purpose of this project is to conduct environmental documentation and preliminary design for the proposed transit improvements in the Columbia Pike corridor in Arlington County and Fairfax County, Virginia.

The improvements will provide enhanced transit service to connect existing and new land development along the corridor, improve access to major activity centers, and encourage transit ridership growth. As developed in previous phases of project planning, the proposed five-mile transit alignment will have 14 proposed stops; service will operate largely in mixed traffic, with some segments of dedicated transit lanes.

To advance the project into final design and construction, environmental documentation is required to evaluate and document potential effects on transportation conditions and social and natural environments in the corridor. This study shall address issues considered to have potential for concern, including transportation; communities; cultural, historic, and wildlife resources; hazardous materials; air quality; and others to be determined.

This scope is based upon the assumption that construction of the Streetcar Project may rely to some extent upon federal grants. In order to make use of potential federal grants, Arlington and Fairfax Counties and WMATA will complete environmental documentation under the National Environmental Policy Act (NEPA). This scope assumes that FTA would be the lead agency in the environmental review process, along with joint lead agencies according to applicable USDOT guidance.

III. Background

Between Spring 2004 and Summer 2005 WMATA conducted an Alternatives Analysis in coordination with Arlington and Fairfax Counties, the Virginia Department of Rail and Public Transportation (DRPT), and the Virginia Department of Transportation (VDOT), with input from Federal Transit Administration (FTA) staff. Building from previous public planning activities in the Columbia Pike corridor, the Alternatives Analysis was supported by intensive public involvement. Three different sets of public meetings and workshops were conducted during the

period of analysis. In Spring 2006, both the Arlington County Board and the Fairfax County Board of Supervisors approved the recommended Modified Streetcar Alternative as the preferred alternative to be advanced into the next stage of project development. During the intervening period, WMATA, Arlington County, and Fairfax County have continued progress through ongoing collaboration with project stakeholders and investigation of several key technical issues.

Important collaborations included:

- Ongoing coordination with Policy Advisory Committee Chairs, Supervisor Penny Gross and Board Member Chris Zimmerman
- December 2006 meeting and project tour with FTA staff
- December 2006 ULI panel focused on Bailey's Crossroads issued strong recommendation to implement streetcar service along the alignment recommended in the Alternatives Analysis
- December 2006 Columbia Pike Revitalization Organization luncheon focusing on the streetcar project
- December 2006 meeting with Bailey's Crossroads developers and private land owners
- May 2007 meeting with Northern Virginia Community College Provost
- June 2007 meeting with Fairfax County's Mason District Land Use Committee
- January 2008 presentation with the Arlington Committee of 100

Technical tasks completed include:

- Coordination of station stop locations with ongoing development of bus "super stops" along Columbia Pike in Arlington County
- Analysis and comparison of potential project right-of-way and easement requirements
- Utilities impact analysis
- Evaluation and concept design for vehicle storage and maintenance facilities
- Updated cost estimates
- Funding strategies analysis

Arlington County has initiated a concurrent and related project, the Columbia Pike Multimodal Project, which is addressing several features including right-of-way parameters, environmental features, and utilities issues. Technical aspects and public involvement activities of this project are anticipated to inform the Streetcar Project as both projects advance.

IV. Project Alignment

The initial phase of streetcar service proposed in this scope is the recommended "Modified Streetcar" alternative from the corridor Alternatives Analysis. Service would connect the major activity centers around Bailey's Crossroads, the active commercial and residential development along Columbia Pike, and the Pentagon City area.

The alignment is approximately 5 miles long, with 14 initially identified station stop locations. At the western end of the corridor, the project alignment begins at the Skyline complex, then follows north along the inside lanes of South Jefferson Street. Turning onto Columbia Pike, the alignment would run along the outside lanes with regular vehicular traffic along most of the Columbia Pike segment. Near the east end of Columbia Pike, the transit alignment would transition to the center travel lanes to avoid potential merging conflicts at the Washington

Boulevard interchange. At the eastern end of the corridor, the alignment follows South Joyce Street and Army Navy Boulevard Drive. From Army Navy Drive, the alignment turns onto South Hayes Street, and then onto 12th Street South. The eastern terminus of streetcar service would be located near the entrances to the Pentagon City Metrorail station.

With regard to the physical configuration of the project, there are several key issues to be considered in the design and environmental work:

- Coordination with ongoing Arlington streetscape and utilities work with related right-of-way requirements
- Coordination with the VDOT Washington Boulevard project
- Coordination with the Arlington Cemetery and Columbia Pike realignment project
- Potential refinement of service terminus points at Pentagon/Pentagon City and in the Bailey's Crossroads area
- Grades along the corridor, particularly at South Jefferson Street
- Four Mile Run stream crossing via existing bridge
- Coordination with Super Stops
- Vehicle storage and maintenance facilities sites

V. Tasks and Deliverables

Task 1: Project Management Plan

The consultant shall appoint a project manager who will be the primary point of contact with WMATA's project manager. The project manager will be responsible for the preparation of a final scope and cost estimate in cooperation with WMATA. The project manager will prepare a work plan and staffing plan, coordinate the work of all sub-consultants, and maintain a central project file in accordance with appropriate quality standards. The project manager will prepare monthly progress reports, which will be shared with WMATA's project manager and included in monthly invoices. The project manager will be responsible for all project deliverables, and will further be responsible for coordinating all quality reviews of those materials prior to delivery to WMATA. The consultant shall also establish a project officer and a quality control officer, whose functions will be included in this task.

Deliverables:

1. Project Management Plan
2. Monthly Progress Reports

Task 2: Agency Coordination

Four distinct groups of stakeholders have been identified. The consultant shall participate in regular coordination meetings with each group, as noted below.

- A Project Management Team (PMT) will consist of staff from WMATA, DRPT, VDOT, Arlington County and Fairfax County. It is assumed that the PMT will meet monthly to review the work plan and monitor the project schedule and deliverables. It is anticipated that the PMT will participate in up to three (3) project briefings with FTA staff and other "participating agencies" as defined under current federal environmental guidance.
- A Technical Working Group will consist of PMT members, technical staff from the PMT group, and may include representatives from Columbia Pike Revitalization Organization (CPRO), Bailey's Crossroads Revitalization Corporation (BCRC), and others as selected by the PMT. It is anticipated that the Working Group will meet at

least quarterly to coordinate public involvement activities and provide input on key project issues.

- A Citizens' Task Force will consist of members of County committees and commissions, and others as identified by the PMT. This group will provide feedback to the PMT and Working Group, and it will also serve to inform citizens' advisory groups and community organizations of project progress. It is assumed that this group would meet at least semi-annually for the duration of the project.
- A Policy Advisory Panel will provide oversight and guidance to the project. This scope assumes that the Policy Advisory Panel will meet semi-annually or as project activities require.

Deliverables:

1. Meeting summaries and briefing materials for up to 39 meetings.

Assumptions:

1. At least two consultant staff will attend each meeting. Meeting time assumes preparation of meeting materials and meeting minutes.

Task 3: Public Participation

The study shall be conducted in a collaborative atmosphere, with public participation integrated into the process of technical evaluation. Timely updates and clear communications with citizens, businesses, developers, and state, federal, and local elected officials are keys to public participation.

The consultant shall prepare materials needed for the meetings. These materials may include invitation mailings, meeting notes, presentation slides, briefing materials, and visual aids such as maps and display boards.

Initial Mailing

The consultant shall mail an initial notice about the project to stakeholders. The mailing list will consist of attendees from prior project meetings and activities, as well as all community groups and stakeholders in the corridor.

Website

At the beginning of the study process, the consultant shall update and enhance the project website with current project information, including a project timeline and public meeting schedules. The consultant shall maintain a current website with status of the study, upcoming events, and summaries of findings and reports. Public comment and feedback shall be facilitated via the website and shall be tracked, reviewed and documented.

Project Meetings

This scope envisions up to six (6) public meetings. At the beginning of the project there will be two public project meetings, one in each jurisdiction, where the scope of the proposed environmental documentation work will be presented and public comment solicited. A second set of public meetings or workshops will be planned for the middle portion of the study to give the public an opportunity to comment on development of the technical analysis. The third set of meetings will be held upon approval of the environmental document by FTA. These are assumed to be public hearings, one in each jurisdiction, where the results of the environmental study will be presented and copies of the Environmental Assessment will be available for review. (See Task 4g for associated public involvement requirements for notifying the public and agencies of EA availability.)

The consultant, in cooperation with the local jurisdictions will arrange for an appropriate public space for each meeting. A notice of the meetings will be mailed to all identified stakeholders and posted on the project website. The consultant will be responsible for development of materials, boards and a presentation for each of the meetings, and will complete a summary report.

The consultant shall participate in project briefings to the local elected officials and other interest groups. The scope anticipates consultant participation in up to twelve (12) briefings of Arlington and Fairfax local commissions or committees, and in up to six (6) County Board or other scheduled public forums. The consultant will assist in preparation for the meetings and facilitation of discussions at the meetings.

Deliverables:

1. Initial Project mailing
2. A project website, with regular updates
3. Scheduling of meeting dates and locations
4. Notice Mailings for public meetings
5. Presentations in PowerPoint and briefing materials for up to six (6) public meetings and up to eighteen (18) local briefings
6. Summary Report of Public Meetings

Assumptions:

1. Project website will be enhanced to include more interactive features
2. Two consultant staff will attend each coordination meeting or briefing. Meeting time assumes preparation of meeting materials and meeting minutes.
3. Up to eight consultant staff will attend each public meeting. Public meeting budgets include staff time, display and presentation materials, advertising, and legal and translation services.

Task 4: Assessment of Potential Effects

The NEPA process and documentation should comply with the federal, state and local requirements. The consultant shall be familiar with these requirements and provide advice to the PMT to ensure compliance with these requirements. One of the key requirements as it concerns this project is the Virginia State Environmental Review Process (SERP).

This scope assumes that the NEPA Class of Action will be an Environmental Assessment (EA). The EA will evaluate potential transportation, social-economic and environmental effects, it shall be a concise effort focused directly on issues concerning the public, FTA, the state, and local jurisdictions. Issues identified shall be specific to this corridor and to the proposed transit infrastructure improvements.

The EA will analyze effects that could occur during the construction period and longer-term impacts resulting from dedicated transitways, and will identify mitigation measures to alleviate potential impacts, as appropriate.

The EA will use 2005 as the base year of analysis and 2015 as the full-build year. A future year of 2030 will also be evaluated. The consultant shall use regional forecasts and other available data sets. The project team will coordinate appropriate technical analysis and stakeholder input between the Multimodal Project and the Streetcar Project.

Task 4.a. Virginia DOT State Environmental Review Process (SERP)

Commonwealth requirements for environmental review apply to this project because it is likely to be funded partly with state funds and because the project involves work on a VDOT Primary road facility. The consultant shall assist WMATA in coordination activities as they relate to the SERP process, including:

- Coordination in connection with any Project Administration Agreements between VDOT or WMATA, Arlington County, and Fairfax County.
- Completion of the EQ 429 form for VDOT and resource agency review.
- Responses to the Preliminary Environmental Inventory based on material prepared as part of NEPA documentation outlined in Tasks 4.e and 4.f below.

Appropriate coordination will allow VDOT to follow through with SERP requirements as necessary, and this documentation will contribute to the content of the environmental document.

Task 4.b. Purpose and Need Statement

The consultant shall prepare the Purpose and Need Statement that lays out the premise for the alternatives to be evaluated. It is assumed that the main elements of the purpose and need have been written during previous phases of the study. Relevant information will be updated and pulled together into a Purpose and Need Statement to be included in the EA.

Deliverables:

1. Purpose and Need Chapter for the EA

Assumptions:

1. Purpose and Need has essentially been written during previous phases of the study.

Task 4.c. Baseline Conditions

The consultant shall establish the base year conditions and identify data requirements for baseline analysis. Such data may include, but is not limited to:

- transit information,
- non-motorized transportation facilities,
- appropriate local and regional plans consisting of transportation plans and programs and land use master plans involving the corridor,
- base year travel demand,
- census data on demographics,
- relevant GIS data from local and state agencies, and
- other required data on natural, cultural, historical and environmental resources.

The consultant shall develop quantitative and qualitative methodologies to compare baseline conditions with the potential effects resulting from the proposed alternatives.

Deliverables:

2. Baseline conditions memorandum

Assumptions:

1. Baseline conditions will be based on readily available information, agency coordination, use of mapping and GIS, and a field review of site conditions. This scope does not include subsurface testing for cultural resources, contaminated sites, wetland delineations or species/habitat surveys.
2. This subtask will use information, as appropriate, provided for the separate Columbia Pike Streetscape project.

Task 4.d. Definition of Alternatives

During this task the consultant will work with WMATA, Arlington County and Fairfax County to define the alternatives to be considered in the EA including alignment, terminus locations, stop locations, operations plans, etc. For the purposes of this outline we are assuming three alternatives: a No Build/Baseline alternative, an Enhanced Bus alternative, and a Streetcar alternative (equivalent to the “Modified Streetcar Alternative” as defined during the alternatives analysis process). The Enhanced Bus alternative could be Pike Ride with a refined operating plan and a full complement of Super Stops.

The alternatives definition effort will include an allowance for assessment of “design refinements” to allow for revenue service connectivity to potential vehicle storage and maintenance facilities in the Pentagon/Pentagon City area and in the Bailey’s Crossroads area.

Deliverables:

1. EA chapter on definition of alternatives.

Assumptions:

1. This scope assumes the definition and evaluation of the No Build Alternative, a Baseline Alternative, and up to three Build Alternatives, to include connections to one primary storage/maintenance yard and one secondary storage maintenance yard.

Task 4.e. Analysis of Transportation Effects

Transportation effects will be an important component of the study. The consultant team will develop a VISSIM simulation of the proposed transit system improvements and transitway along the corridor. This simulation will be a conceptual analysis and will focus on the transit operations, traffic and transportation effects along the corridor. This analysis will be based on the data collection and modeled scenarios developed as part of the Multimodal project. Since that analysis is limited to the Arlington County portion of Columbia Pike, the transportation analysis for the Streetcar Project will be expanded to include alignment segments and intersections in Pentagon City and in Fairfax County that are outside the scope of the Multimodal project. The scope assumes that simulations will be prepared for seven (7) to ten (10) scenarios, including: No Build/Baseline conditions for the base year (2009), 2015, and 2030; Enhanced Bus Build conditions for 2015 and 2030; Streetcar Build conditions for 2015 and 2030; and combinations of mixed-traffic and dedicated lane operations.

The consultant shall document the project effects on roadways and operating conditions as follows:

- vehicular traffic,
- pedestrian and bicycle movements,
- transit operations,
- potential modifications to roadways.

Subtasks include:

- Conduct ridership forecasting for the three alternatives and design refinements identified in Task 4.c.
- Identify major road segments and intersections to be included for analysis.
- As necessary, conduct/collect turning movement counts and traffic signal information for signalized intersections during AM and PM peak periods. It is anticipated that much of this information will be supplied by Arlington and Fairfax Counties; the consultant’s cost proposal should include an allowance for traffic data collection.

- Collect information on lane configuration, transitway configuration, other proposed modifications to roadway facilities, and station locations.
- Conduct travel time runs in each direction during both AM and PM periods
- Develop an existing conditions model using a traffic simulation program.
- Develop measures of effectiveness (MOE) for bus services and traffic operations.
- Assess traffic conditions for the opening year (2015) using anticipated traffic growth rates.
- Develop peak and off-peak bus service plans and assess impact on bus ridership and facilities needed for off-peak turnback at Jefferson Street streetcar stop. This exercise is to be supported by on-off data from Arlington and Fairfax Counties and WMATA.
- Propose necessary changes to traffic operations and roadway geometry to improve future traffic conditions and pedestrian access to transit facilities as specified above.
- Develop mitigation measures to ease potential transportation impacts during construction and after full operation.
- Assess traffic conditions for the analysis year (2030) using anticipated traffic growth rates.

Assumptions:

1. Ridership forecasting: For this type of project, FTA is currently recommending a procedure based on ride checks and similar data, with the model primarily serving as a backup and as an aid in processing and setting up the ride check data. AECOM Consult staff recommends an early meeting with FTA to seek direction regarding the extent of the baseline alternative.

Task 4.f. Analysis of Social and Economic Effects

The Socio-economic analysis will target potential community impacts and property acquisition.

Community Impacts

The consultant shall conduct an in-depth analysis of the socio-economic characteristics of employees and residents in the corridor and identify low income households and minority populations who would be most vulnerable to potential adverse changes (Environmental Justice). Per the direction of the PMT, the consultant shall use the 2000 census or other approved source data for this assessment.

In addition to the socio-economic data reviewed, analysis will occur to determine potential impacts and benefits to community facilities, such as libraries, hospitals, schools, etc that may exist along the corridor. A qualitative assessment of “community fit” of the proposed action on adjacent communities will also be undertaken. The potential for the proposed action to disrupt the community will also be evaluated.

Property Acquisition

This will include an analysis of any displacements associated with property acquisition in connection with the transit alignment, stops, or facilities. It is anticipated that the majority of analysis will be completed under the Multimodal project. However, there may be effects associated with passenger stops, the vehicle maintenance and storage facility, and transit center (park-and-ride) facility at South Jefferson Street, which would be covered under this task.

Task 4.g. Analysis of Environmental Effects

The environmental analysis shall highlight issues of concern in the corridor as listed below. Additional issues to be determined during the on-going project preparation phase should be included for evaluation.

Culture and Heritage Resources (Section 106)

The consultant shall coordinate with local governments, the Virginia Department of Historic Resources (VDHR) and other concerned agencies to determine direct and indirect impacts on cultural and historic resources. The Pentagon and other adjacent historic sites are of particular interest given the proposed alignment option in its vicinity.

Parks and Wildlife Refuges

The consultant shall coordinate with local jurisdictions and the Virginia state departments managing natural resources to assess potential impacts and develop mitigation plans, should such impacts exist. The consultant shall conduct a Section 4(f) evaluation and prepare documentation, if appropriate.

Threatened and Endangered Species

The consultant shall make an inquiry of the U.S. Fish and Wildlife Service (USFWS) about the presence of threatened or endangered species or habitats in the corridor.

Coastal Zone Management Act Consistency Determination

The consultant shall develop and submit a request for a Coastal Zone Management Act Consistency determination through the Virginia Department of Environmental Quality (DEQ).

Water Resources (surface waters, wetlands, floodplains, and water quality)

The consultant shall identify wetlands, floodplains, and waters of the US that will be impacted by the project. The consultant shall assess impacts on water quality. Coordination with the U.S. Army Corps of Engineers and DEQ will be undertaken to identify and assess potential effects on these resources.

Hazardous Materials

The consultant shall focus on sites within ¼ mile of the studied alignment. Locations of sites were briefly evaluated in the Environmental Scan Report.

Air Quality

The consultant shall obtain air quality data from MWCOG and identify whether the corridor is in attainment/non-attainment with the National Ambient Air Quality Standards (NAAQS). The consultant shall compare air quality conditions in the base year with conditions in the full-build year. A determination of conformity will be made.

Noise and Vibration

The consultant shall conduct an FTA General Assessment for both noise and vibration in the corridor.

Visual and Aesthetics

The consultant shall conduct an assessment of potential visual and aesthetic effects of the proposed alternatives, focusing on the potential use of an overhead contact system for the streetcar alternative.

Task 4.h. EA Development

This task includes the work effort to produce an EA for the client group and FTA approval. A draft table of contents for the EA is shown as an attachment to this document. The consultant shall prepare a review draft for the client group prior to submittal to FTA. Comments from the client group will be incorporated, as appropriate, and submitted to FTA for their review and approval to release to the public. This assumes two iterations of review for both the client group and for FTA. This task also includes production costs.

Upon approval of the document by FTA, the document will be made available for public inspection at up to 8 locations to include the Arlington and Fairfax County offices, public libraries and the appropriate field office of FTA. A notice of availability will be sent to all affected local, state and federal agencies. Per federal requirements, the FTA approved document must be available at the public hearing as well as provided to the public for review 15 days prior to any public hearing. Availability of the document and locations where it can be reviewed shall be announced in the local newspapers. The public has 30 days to submit written comments from the notice of availability.

As required by federal regulations, the applicant must offer a willingness to hold a public hearing. As outlined in Task 3, Public Participation, up to 6 public meetings are proposed. This assumes that the final two public meetings may be public hearings.

Upon receipt of written comments from the public, the EA will be revised accordingly and comments will be included in the EA. If no significant impacts have been identified, then the revised document will be submitted to the FTA for recommendation of a Finding of No Significant Impacts (FONSI). Upon approval by FTA, a notice of availability of the FONSI shall be sent to affected local, state and federal agencies.

If the EA determines significant impacts will occur, then a separate NEPA action (Environmental Impact Statement) will likely be required. This determination would result in a separate scope and budget.

Deliverables:

1. Draft EA report. The consultant shall submit electronic copies and up to 15 hard copies of each draft report to the client group. It is assumed for submission to FTA that up to 5 hard copies will be provided.
2. FTA approved EA: The consultant shall submit up to 40 hard copies and 40 copies on CDs to the client group. All data and digital files shall be provided to the PMT group in hard copy and electronic format. Notice of Availability of the EA in Local Newspapers and via letter to affected local, state and federal agencies.
3. Public Transcripts of Public Hearings.
4. Notice of Availability to local, state, and federal agencies of the FONSI/EA and up to 8 copies of the document to be made available for public review.
5. Signed FONSI/EA.

Task 5: Financial Plan and Project Sponsorship

The Consultant will support the efforts of Arlington County and Fairfax County as they continue to refine the preliminary financial plan for the Streetcar Project. The funding sources and financing structures for the Streetcar are still undecided, and the potential private, local, regional, state, and federal funding sources will continue to evolve during this period.

At the same time, as the preferred funding options are determined, they will directly influence the choice of project sponsor, and as the project prepares to move into the next stages in

preparation for implementation, these critical strategic choices will need to be nearly or fully decided.

An additional related factor is procurement strategy. Instead of pursuing a typical design-bid-build process, Arlington and Fairfax counties may decide to pursue project implementation by means of a Design-Build or Design-Build-Operate-Maintain (DBOM) contract, and this will affect the approach to project funding and project sponsorship.

The consultant will perform an advisory role in this task. Products will include workshop presentations, meeting minutes, and up to four (4) case studies focused on the development and financing of peer transit systems, and associated briefings to County financial staff.

This task will also include an allowance to monitor ongoing development of the FTA Small Starts program and the Virginia state grant process, and to prepare reports and templates in support of a Small Starts application and a Virginia grant application.

Deliverables:

1. Attend and prepare materials for up to six (6) meetings/workshops with County financial planners.
2. Prepare up to four (4) case study briefings on project financing and implementation.
3. Prepare templates in support of a Small Starts application.
4. Prepare templates in support of a Virginia grant application.

Assumptions and notes:

1. The decision whether to pursue to Small Starts funding will be made by the client group prior to issuance of NTP. If the project sponsors determine not to pursue federal or state grant funds, the work described under this task may be customized to focus on private capital sources and related financial planning. Note:
 - a) The New Starts/Small Starts process is highly competitive. Many worthy projects fail to receive funding, and many other worthy projects receive a lower federal share than they had initially assumed.
 - b) The New Starts/Small Starts process is time-intensive and costly. A decision to forego federal funding will usually move up the implementation date of a project significantly, which brings the project to citizens more quickly and avoids inflationary cost increases.
2. There will be a single point of contact "project sponsor" for the FTA and State submissions, to be determined prior to any official submissions. The choice of project sponsor is critical to a potential Small Starts application, as FTA will evaluate not only the effectiveness of the Streetcar project itself, but also the financial capacity of the project sponsor to build, operate, and maintain the Streetcar into the future. The sponsor need not be responsible for all aspects of the project (funding, contracting, construction management, operations). A number of options are possible, including, but not limited to sponsorship by:
 - a. One of the two Counties (Arlington or Fairfax), with the other County in a secondary role.
 - b. Both Counties acting jointly.
 - c. WMATA
 - d. Virginia DRPT
 - e. A special-purpose not-for-profit entity, similar to Portland Streetcar, Inc.
3. The relationship between the Columbia Pike project and the proposed transit improvements in the Crystal City/Potomac Yard Corridor should be defined. If federal funding is likely to be pursued for that project as well, it is critical that the planning and design efforts be

coordinated so that the projects are not directly competing for funds and so that potential efficiencies (such as shared yard facilities) can be taken advantage of.

4. The Virginia grant application process is still unknown at this point. If it is similar to the FTA process, then the additional burden should be relatively small. If it is significantly different, the effort could be substantial, particularly since the process will be new and untested.
5. This estimate assumes completion of all parts of the Small Starts application.

Task 6: Preliminary Engineering

Develop preliminary engineering plans with the goals of identifying physical requirements of the project, developing more refined cost estimates, and preparing for the final design and construction phases of the project. As the Multimodal and Streetcar projects advance, it will be critical to develop a coherent set of preliminary design documents that covers all necessary aspects of project development while eliminating unnecessary redundancy. The consultant shall coordinate design work with ongoing street and streetscape design progressing under the Multimodal project. Design criteria will be in accordance with the WMATA manual: Tram/LRT Guideline Design Criteria (2003). Where necessary, other applicable standards will be followed and referenced.

The following preliminary design task descriptions are presented in keeping with a “traditional” design-bid-build project delivery process. The overall goal is to define the project in preparation for final design. Emphasis is placed on those areas that have the greatest potential effect on the project cost estimate.

In the initial phase of the project work preliminary design will be advanced in close coordination with environmental documentation. Once the environmental clearance has been obtained the preliminary design will be completed in a second phase.

Task 6.a. Alignment Development

Based on the outcomes of the initial PMT and public meetings (Tasks 2 and 3, above) the Consultant shall refine the general alignment drawings prepared during FY07 project development.

Deliverables:

1. Revised set of concept transit alignment plans to be used as a basis for environmental documentation.

Assumptions:

1. Alternate alignments connect with up to two locations for maintenance and storage facilities, one at each end of the project corridor.

Task 6.b. Operations Planning

The Consultant shall prepare operations plans and draft O&M cost estimates based on the definition of alternatives to be evaluated in the EA document. Refined plans and estimates will accompany the final preliminary design submission.

Deliverables:

1. Draft operations plans
2. Draft O&M costs
3. Refined operations plans
4. Refined O&M costs

Assumptions:

1. The operating plan for the Enhanced Bus and Streetcar alternatives will follow the Modified Streetcar Alternative operating plan as developed for the 2005 AA.
2. This subtask includes the effort (noted in Task 4d) to develop service plans related to a bus turnback/transfer facility at Jefferson Street.
3. Consider appropriate Metrobus, ART, DASH, and Fairfax Connector routes.
4. Consider adding capacity and costs for additional vehicles if necessary.

Task 6.c. Aerial Photography and Mapping

Recent aerial photography is available through Arlington County and Fairfax County. Likewise, a recent survey of the corridor has been conducted, including topographic and planimetric information. This task will include supplemental mapping along Columbia Pike to include comparable detail in the Pentagon City and Bailey's Crossroads areas.

Deliverables:

1. Mapping and aerial photography with supporting survey data.

Assumptions:

1. An allowance for ground survey will be shown in the consultant's estimate.
2. Survey data along the main section of Columbia Pike includes appropriate detail for transit plan and profile development.

Task 6.d. Utilities, Structural, and Geotechnical Data Collection

Utilities

Supplement recent utility mapping along Columbia Pike to include comparable detail in the Pentagon City and Bailey's Crossroads areas. Compile existing utility mapping along Columbia Pike; obtain existing utility information in the Pentagon City and Bailey's Crossroads areas using existing utility as-built data from WMATA, Arlington, Fairfax, and utility companies; prepare comprehensive utility data file; and update utility matrix.

Project Initiation: Attend team kick-off meeting; plot map of project area, including known utility locations; walk the project alignment and note existing utility types and ownership in expanded project areas.

Deliverables:

Prepare data map of all known existing utility information; prepare summary report to include potential utility impacts and associated costs for relocation and/or replacement.

Utilities Assumptions:

1. Meetings: Attend project team meetings as required. (Assume 6 meetings.)
2. Submittals, QA/QC: Assume two review cycles.
3. No utility designation services will be performed.
4. No field survey of existing utilities will be performed.
5. No utility relocation design will be performed.

Structural

Collect and summarize structural inventories and inspection analyses for existing structures, including the parking deck at Skyline, the bridge over Four Mile Run, and other potentially

affected structures. Work will include a preliminary review of the available mapping identifying the existing structures (bridges and retaining walls) that will be potentially impacted by the proposed alignments:

- Retaining walls and elevated structures (decks) providing entrance to the Skyline Complex.
- Bridge over Four Mile Run.
- Columbia Pike under Washington Boulevard
- Potential retaining walls for transit alignment east of Navy Annex.
- Joyce Street under Washington Boulevard and I-395 (vertical clearance, existing footings for piers, abutments, and wing walls).

The consultant will perform a field visit to identify and verify all impacted structures, and will request as-built drawings, inspection reports, boring logs, load ratings, and other pertinent information for all affected structures. The consultant will evaluate the impact of the proposed alignment on existing structures, and prepare a summary report for each structure with recommendations and preliminary cost estimates.

Structural Assumptions:

- The as-built plans and inspection reports for all structures will be available.
- The consultant will not perform any structural analysis for the structures at this level of design.
- The evaluation of each structure will consist of visual inspection, review of the drawings and review of load rating calculations.
- No additional borings will be taken at this level of design.
- No drawings will be produced at this level of design (just the report).

Geotechnical

Collect and summarize relevant geotechnical analyses from locations along the project corridor. Coordinate with Multimodal project to review any new soil or geotechnical data gathered, particularly as it relates to the structure of the existing streets along the project alignment.

Deliverables:

1. Report summarizing existing geotechnical data

Geotechnical Assumptions:

1. No new field work to obtain soil or geotechnical data is included.

Task 6.e. Facilities Design Development

As part of the previous stage of planning, the consultant prepared sketch concepts for vehicle storage and maintenance facilities at four (4) different locations along the project corridor. During this task, the consultant shall refine these sketch concepts and conduct a comparison and evaluation resulting in selection of one site for primary vehicle maintenance and storage and a second, smaller site, for overnight vehicle storage only. Then, the consultant shall prepare preliminary programs and preliminary designs for the primary and support facilities, as required by the recommended operations plan.

Prepare preliminary program, concept plans, and preliminary design for one transit center (park-and-ride) facility near Bailey's Crossroads on or adjacent to South Jefferson Street.

Deliverables:

1. Refined sketch designs for four (4) vehicle storage and maintenance facility sites and transit center (park-and-ride) facility.
2. Technical memorandum summarizing the site evaluation and selection process.
3. Refined program for vehicle storage and maintenance facilities and transit center (park-and-ride) facility.
4. Preliminary designs for one (1) primary vehicle storage and maintenance facility, one (1) secondary vehicle storage facility, and one (1) transit center (park-and-ride) facility.

Assumptions:

1. Refined sketch designs will be adapted from the 2007 work products.
2. Transit center (park-and-ride) facility location to be determined by Fairfax County staff.

Task 6.f. Track Alignment

Develop detailed track alignment plans, to include plan and profile, typical sections, typical track details, special trackwork details, and appropriate general information sheets.

Deliverables:

1. Draft plans:
 - a. Alignment plans (horizontal alignment)
 - b. Alignment profiles (vertical alignment)
 - c. Typical sections
 - d. Typical track details and special trackwork requirements
 - e. Preliminary construction cost estimate.
2. Refined alignment plans (after review/comment by client / county authorities)
 - a. Alignment plans (horizontal alignment)
 - b. Alignment profiles (vertical alignment)
 - c. Typical sections
 - d. Typical track details and special trackwork requirements
 - e. Refined preliminary construction cost estimate.

Assumptions:

1. Upgrade concept transit alignment plans.
2. Define limits of construction along transit alignment.
3. Ground survey for the Bailey's Crossroads and Pentagon City areas is assumed to be completed by others; an allowance for survey in the Pentagon City and Skyline areas is to be included in the consultant's estimate (see Task 6c).
4. It is assumed that the street design along Columbia Pike will be performed by others. This design information will be incorporated onto the track plans in this area. The consultant will perform the roadway/street design for the remaining areas at Bailey's Crossroads and Pentagon City.
5. It is assumed that right-of-way determinations related to the typical street cross-sections will be made as part of the Multimodal project.

Task 6.g. Station Design Development

Adapt general design vocabulary developed for Super Stops to Streetcar station stops.

Deliverables:

1. Preliminary designs for station stops
2. Report of recommended facilities and equipment for station stops, including fare equipment, communications equipment, lighting, security, etc.

Task 6.h. Civil/Streetscape Design

This task involves preparing designs that facilitate proper street interface with streetcar track and station stops. Given the emphasis of the Multimodal project on the central portion of Columbia Pike, this work will be focused in the Bailey's Crossroads area and in Pentagon City. Preliminary designs will include section and plan views showing layout of proposed roadway improvements, plans showing proposed sidewalk and intersection improvements, and conceptual layouts of the conceptual storm drainage system.

In addition, civil support services shall include preliminary design of roadway improvements associated with the proposed track alignment. Preliminary roadway features, to be shown on the track plans, will include proposed curb and gutter, proposed sidewalk and streetscape improvements, approximate inlet locations, and entrance tie-ins. Where existing inlets and other storm drain appurtenances will be impacted by the proposed construction, these will be indicated on the plans.

Deliverables:

1. Preliminary layout of proposed roadway improvements, superimposed on the track plans. (No separate roadway profile will be provided at this time.) Standard symbology will be used to differentiate between proposed new pavement (where widening is required) and areas to be resurfaced.
2. Preliminary Roadway Typical Sections (Bailey's Crossroads and Pentagon City areas).
3. Preliminary (conceptual) storm drain layout showing proposed inlet locations and approximate pipe sizes for the storm drain system along the roadway.
4. Preliminary sidewalk layout, including approximate locations of proposed ADA compliant handicap ramps.
5. Preliminary intersection layout detail sheets (assume 5 locations on west end and 5 locations on east end).
6. Preliminary construction cost estimate.

Assumptions:

1. It is assumed that the street design along Columbia Pike will be performed by others. This design information will be incorporated onto the track plans in this area. The consultant will perform the roadway/street design for the remaining areas at Bailey's Crossroads and Pentagon City.
2. Regular-interval cross sections are not included in this scope.
3. No Maintenance of Traffic plans will be prepared.
4. No Erosion and Sediment Control plans will be prepared.
5. No Stormwater Management design will be prepared.
6. Specific Signing and Pavement Marking plans will not be prepared.
7. Specific Street Lighting plans will not be prepared.
8. Streetscape concepts will be informed by sustainable design, incorporating Low Impact Development standards for storm water, using indigenous plant material, permeable pavement, etc.
9. Concept landscape designs will be included in the roadway design plans for Bailey's Crossroads and Pentagon City.

Task 6.i. Systems Design Development

This subtask will involve close coordination with operations planning tasks described in subtasks 4.d. and 6.b. above. It will include concept designs for the following elements:

- Traction power system: preliminary OCS design assumptions, substation locations, source power locations
- Traffic signal system: coordination with Arlington County and Fairfax County signal priority systems; identify issues related to signal design; complete preliminary design
- GPS vehicle locator system
- Ticket vending system, compatible with WMATA SmarTrip
- Safety and Security systems

Deliverables:

1. Preliminary design plans for traction power system
2. Preliminary traffic signal design plans
3. Concept plans and general specifications for vehicle information, ticket vending, and safety/security systems

Assumptions:

1. Preliminary signal design plans to be developed at up to 10 locations, focused on areas where special phases or signals for transit may be required.

Task 6.j. Streetcar Vehicle

To this point in the study process, the assumed vehicle has been the Skoda-Inekon streetcar, as specified by DDOT for the Anacostia streetcar project. It is assumed that this vehicle type will be used as the basis for design to inform the environmental documentation. As part of the preliminary engineering analysis, the consultant will conduct a brief assessment of the viability and appropriateness of other transit technologies for use within the project scope as defined. At the conclusion of the environmental planning phase, the consultant will confirm vehicle technology; then, during PE, the consultant will develop specifications and a draft schedule for vehicle procurement.

Deliverables:

1. Assessment of other applicable transit technologies
2. Summary of bid specifications and schedule for procurement

Task 6.k. Project Design Criteria

Project design criteria used for conceptual design work were the "WMATA Tram / LRT Guideline Design Criteria" prepared by WMATA in August 2003. Review and revise these criteria, as required, to conform to design decisions made by the responsible counties and operating authority for the Columbia Pike project. Design guidance for vehicles, alignment, trackwork, station stops, street design, utilities relocation, traction power, streetcar signaling, operations, maintenance and storage yard facilities, fare collection, fire/life safety, etc. shall be reviewed and revised as required for the preliminary design phase of this project.

Deliverables:

1. Draft Design Criteria
2. Refined Design Criteria, after review/comment

Assumptions:

1. This task includes a review of the current WMATA criteria and anticipates only minor revisions (if any).
2. The deliverable is anticipated to be a short technical memo highlighting relevant sections and any changes in the established WMATA criteria.

Task 6.I. Preliminary Engineering Report

The Consultant shall compile written results of the preliminary design tasks into a summary report that details key findings for each of the design task areas. The report will include a summary of capital cost estimates prepared for capital items to be included in the Streetcar Project.

Deliverables:

1. Draft Preliminary Engineering Report
2. Refined summary of project capital costs
3. Refined Preliminary Engineering Report, after review/comment

Task 7: Project Specifications for Design-Build or Design-Build-Operate-Maintain (DBOM) Procurement

The foregoing task descriptions are presented in keeping with a “traditional” design-bid-build project delivery process. At the completion of the preliminary design effort described in Task 6, Arlington and Fairfax counties may decide to pursue project implementation by means of a Design-Build or Design-Build-Operate-Maintain (DBOM) contract. In the event that the counties decide on this path, the consultant will assist in preparing documentation to support advancement of the project along one of these specific paths.

This task has not been fully defined at this point. A placeholder budget will be allocated so that this task may be initiated to correspond with project sponsor decisions regarding project delivery method.