

## 1.0 EXECUTIVE SUMMARY

### 1.1 Study Background

Columbia Pike (Virginia State Highway 244) is a vibrant, busy thoroughfare running east and west through Arlington County from Arlington Cemetery to Bailey's Crossroads in Fairfax County and beyond to Annandale. Columbia Pike is experiencing rapid growth as a mixed use employment, commercial, and residential corridor due in large part to its direct proximity to the District of Columbia and major regional attractors including the Pentagon, Pentagon City, and the Skyline complex near the intersection of Columbia Pike and Leesburg Pike (Virginia State Highway Route 7).

Recognizing the potential of the emerging transit market, the Washington Metropolitan Area Transit Authority (WMATA), in conjunction with Arlington and Fairfax counties, initiated the *Columbia Pike Alternatives Analysis* ("Pike Transit Initiative") to consider the development of an advanced transit system connecting the Pentagon/Pentagon City area with Bailey's Crossroads.

The Pike Transit Initiative is founded upon several planning efforts that have considered transit capacity increases within the proposed corridor to facilitate mobility and spur economic development efforts. Multiple agencies, including Arlington and Fairfax counties, the Metropolitan Washington Council of Governments (MWCOC) and its Transportation Planning Board, WMATA, and the Northern Virginia Transportation Commission (NVTC) have included the study area in the long-range planning documents described below:

- The 1999 WMATA *Transit Service Expansion Plan* which first identified Columbia Pike as a corridor well suited for expansion of fixed guideway services.
- The 1999 Northern Virginia Transportation Coordinating Council (now Northern Virginia Transportation Authority) *Northern Virginia 2020 Transportation Plan* identified Columbia Pike as a key corridor for bus (2010) and rail (2020) transit improvements.
- WMATA's 2002 *Regional Bus Study*, which resulted in additional bus improvements along the Columbia Pike corridor. These improvements, with the brand identity PikeRide, have increased ridership levels by nearly 10%.
- WMATA's 2002 *Transit Study for Columbia Pike and Leesburg Pike - Phase 1 Report* and the follow-up *Phase 2 Report* which provided a detailed engineering feasibility study of rail alternatives along Columbia Pike.

The Columbia Pike corridor is an area that has often been described as 'Arlington's Main Street.' The unique combination of local businesses, diverse neighborhoods, and everyday amenities along this busy corridor gives it an international flair. Transportation planning in the corridor has been coordinated with Arlington and Fairfax County land use and redevelopment initiatives. Through cooperation with both Counties, transportation plans and projects are expected to support community development initiatives articulated in their various plans including:

- The 1998 Fairfax County *Bailey's Crossroads Revitalization District*
- Arlington County's 2002 *Columbia Pike Initiative-A Revitalization Plan*
- Fairfax County's 2003 *Comprehensive Plan*,
- The 2003 Arlington County *Form Based Code*, and
- The 2004 Arlington County *Street Space Planning Task Force Report*.

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## 1.2 Study Guidance and Participation

Input from the general public, the business community, and neighborhood groups, as well as the elected officials and transportation and planning staffs of both Arlington and Fairfax counties has been central to the process of the Alternatives Analysis phase of the Pike Transit Initiative. The study relied on extensive public participation, periodic input from the Policy Advisory Committee, and frequent workshops with the Technical Working Group in the formulation and evaluation of alternatives, and in the selection of the recommended preferred Alternative. The role of each of these groups and the methods used to consult with them are described below.

### ***General Public and Stakeholders***

At the start of the Alternatives Analysis, information was provided to the public through introductory project materials, including a project fact sheet and website. The project team also conducted a first set of project briefings at community group, neighborhood association, and County board and commission meetings. The team then held a week of “design dialogue” sessions involving stakeholders and the general public to solicit input from these constituencies. Further public involvement included a series of “open houses” midway through the analysis, where stakeholders and the general public were presented with the opportunity to comment on the direction of the project at that point. The project website and newsletters provided information and updates to the public throughout the Alternatives Analysis process.

Relevant comments and direction from these interactions were included in the preliminary definition and subsequent screening of alternatives. The team conducted a final round of public meetings prior to the study’s conclusion to share findings and recommendations for the implementation of a premium transit system on Columbia Pike.

### ***Technical Working Group***

The Technical Working Group included transportation and planning staff from Arlington and Fairfax counties, the Virginia Department of Transportation (VDOT), Virginia Department of Rail and Public Transportation (DRPT), WMATA, the Columbia Pike Revitalization Organization (CPRO), the Department of Defense, and the Pentagon. The group met monthly to review and discuss progress on the project. Members of the Technical Working Group provided information on the study area to the project team, and worked closely with the project team in the definition and evaluation of project alternatives.

### ***Policy Advisory Committee***

The Policy Advisory Committee (PAC) included decision-makers from relevant jurisdictions and public agencies. Members of the PAC reviewed materials and provided policy direction at key points during the Alternatives Analysis process. The PAC co-chairs, Chris Zimmerman, Arlington County Board Member, and Mason District Supervisor Penelope Gross of Fairfax County, provided guidance on policy decisions affecting the project. Mr. Zimmerman and Supervisor Gross also reviewed presentation materials and project recommendations.

### 1.3 Study Process and Report Overview

The Pike Transit Initiative technical work was organized as a three-step screening process, to narrow the field from a list of all potential alternatives to a set of feasible alternatives, and then to one recommended preferred Alternative.

The three separate screens were:

1. An engineering and policy screen to quickly review a wide range of alternatives to determine their suitability within the known physical and policy constraints of the project corridor.
2. A goals and objectives screen to ensure that the small set of suitable alternatives resulting from the engineering and policy screen meet the goals and objectives of the project.
3. A costs and impacts screen to determine which alternative meets the project purpose and need most efficiently and with the fewest potential adverse impacts.

The first screen considered a broad range of alternatives, then narrowed the field to arrive at a small set of alternatives that would be realistic and suitable for the Columbia Pike corridor. This step is outlined in Section 3 of this report.

The small set of alternatives, defined in detail in Section 4 of this report, included:

- No Action (or Baseline) Alternative,
- Bus Rapid Transit (BRT) Alternative,
- Streetcar Alternative, and
- Modified Streetcar Alternative.

The second screen evaluated the smaller set of alternatives against the stated project goals and objectives. Proposed goals and objectives for the Pike Transit Initiative (see Table 1-1) were developed based on: 1) the needs and transportation problems identified through the public involvement process, 2) consultation with transportation and planning staff of WMATA, Arlington and Fairfax counties, and 3) goals included in regional long-range transportation plans. As outlined in Section 5 of this report, each of the Alternatives was evaluated against measures derived directly from the goals and objectives.

**Table 1-1: Goals and Objectives**

Goals	Objectives
Mobility	Increase mobility within the corridor.
Community and Economic Development	Contribute to and serve as a catalyst for economic development.
Safety	Provide for a safe environment for all modes of travel.
Regional Connections	Improve regional transportation connections.
Community Goals	Complement community goals to create a pedestrian-friendly 'Main Street' environment in the corridor.

The third screen evaluated the potential costs and impacts of the Alternatives were evaluated to determine which Alternative met the project purpose and need most efficiently and with the fewest potential negative impacts (Section 6 of this report). Part of this process involved a qualitative assessment of the potential for the Alternatives to be advanced given the limitations of federal, state and local funding sources.

Findings from the second and third screenings led to the definition and evaluation of an additional Build Alternative that would achieve many of the benefits of the initial Build Alternatives but with a lower overall cost. This Modified Streetcar Alternative is defined in Section 4.4 of this report. The new Alternative was subjected to the same evaluation process, and the results are noted along with results for the other Alternatives in Sections 5 and 6.

The screening process culminates with a recommended preferred Alternative. Section 7 of this Report summarizes the conclusions of the Alternatives Analysis, reviews the technical and policy recommendations, and outlines appropriate “next steps” for advancing the Pike Transit Initiative.

## 1.4 Alternatives Considered

The goal of the initial screening was to briefly consider a wide range of possible improvements and select from them a short list of the most appropriate alternatives, given the known physical and policy constraints of the project corridor. Physical constraints include considerations such as roadway and right-of-way widths, features of the natural and built environment, and current travel patterns. Policy constraints made by local officials that shaped potential alternatives for the study area included:

- Transit should be surface running.
- The proposed transit system should operate in shared travel lanes.
- The proposed transit system should be compatible with the urban scale of the study area.

This screening process yielded a small set of Alternatives that were evaluated in greater detail. The four Alternatives are summarized below:

The **Baseline Alternative** includes transit and roadway projects within the study area that have committed funding. Enhancements to the existing PikeRide service will include signal priority for transit vehicles, enhanced passenger information, and improved passenger facilities. Programmed roadway reconstruction projects along Columbia Pike include several streetscape and utility projects, some of which will be constructed in conformance with the Arlington County Street Space Planning Task Force recommendations.

The **BRT Alternative** would introduce a new premium transit service along Columbia Pike, including modern 60-foot BRT vehicles, significantly upgraded passenger facilities, and curb-to-curb roadway reconstruction to facilitate bus movement and to promote traffic and pedestrian safety along the corridor. Service would be provided at 3-minute headways during peak periods, with 6-minute base headways. The background bus system would be significantly modified to support the new BRT service. The BRT Alternative would run approximately 6 miles between Bailey’s Crossroads and the Pentagon. A more complete description of the alignment can be found in Section 4.2.3. For a map of the proposed BRT alignment, see Figure 4-5.

The **Streetcar Alternative** would similarly introduce a new premium transit service along Columbia Pike. Transit vehicles are assumed to be modern 67-foot Skoda trams, powered via an overhead contact system. The Alternative would include significantly upgraded passenger facilities and reconstruction of one lane along Columbia Pike for installation of embedded track. Service would be provided at 3-minute headways during peak periods, with 6-minute base headways. The background bus system would be significantly modified to support the new Streetcar service. The Streetcar Alternative would run approximately 6 miles between Bailey’s Crossroads and the Pentagon. A more complete description of the alignment can be found in Section 4.3.3. For a map of the proposed Streetcar alignment, see Figure 4-5.

The **Modified Streetcar Alternative** combines elements of the other Alternatives—notably a streetcar project, with continued extensive bus service—and would both improve transit service efficiency and make a significant investment in the community.

One of the goals in defining this Alternative was to develop a functional project that could be constructed for a lower total cost than the initial Streetcar Alternative, yet would serve the same community goals. Basic features of this Alternative are as follows:

- Shorter overall length extends from Skyline to Pentagon City (5 miles) as opposed to the original 6-mile line. For a map of the proposed Modified Streetcar alignment, see Figure 4-5.
- The Modified Streetcar fleet would be sized to run at constant headways throughout the day: 6 or 12 minutes, as opposed to 3 minute peak service in the original alternatives. The reduced fleet size requires smaller maintenance and storage facilities.
- The Modified Streetcar service would be augmented with WMATA buses to meet 3 minute peak headways, carry peak passenger demand, and supply service for trips such as those from Annandale that are more efficiently accommodated via bus service. Under the original Streetcar Alternative these trips would be forced to transfer and excessively penalize patrons.

## 1.5 Evaluation Results

Table 1-2 summarizes key characteristics of the Alternatives evaluated for the forecast year 2030. Compared to the No Build/Baseline Alternative, the Build Alternatives show a significant increase in corridor ridership. The BRT and full build Streetcar Alternatives show about 45% increase in ridership and the Modified Streetcar Alternative shows about 30% increase in corridor ridership over the Baseline. The increase in ridership can be attributed to the reduction in transit travel time to Pentagon/Pentagon City and direct access to Skyline area. The model does not include a mode preference as per FTA guidance.

VISSIM traffic simulation software was used to develop forecasts of comparative traffic conditions for each Alternative. In general, addition of a transitway does not cause large changes in the traffic operations in the corridor. Exceptions include the Leesburg Pike/Jefferson Street intersection and two intersections along Army Navy Drive. At the Leesburg Pike/Jefferson Street intersection, signal priority is given to a minor street, impacting vehicular flow on the major roadway. Other instances where traffic operations are negatively affected occur when the transitway makes a turn, requiring more restrictive signal control. Locations where traffic operations would be worsened by signal priority control could be improved by reducing the level of priority afforded to transit vehicles. The transit improvements considered would not significantly affect automobile travel times, however, they bring transit travel times more closely in line with automobile travel times, reducing the 'transit time penalty.' There would be no significant differences in automobile or transit travel times among the Alternatives. However, the Modified Streetcar Alternative, because of the reduction in the frequency of premium service, offers benefits to traffic operations at some intersections because of the reduction in the number of traffic signal preemptions.

**Table 1-2: Summary of Transportation Characteristics Alternative**

Cost Element	Baseline	BRT	Streetcar	Modified Streetcar (6 min.)
Projected Ridership	15,670	22,490	23,080	20,670
Transit Travel Time (peak hour/peak direction)	27 min.	18 to 20 min. (up to 25% decrease)	18 to 20 min. (up to 25% decrease)	18 to 20 min. (up to 25% decrease)
Auto Travel Time (peak hour/peak direction)	15 min.	15 to 16 min. (up to 7% increase)	15 to 16 min. (up to 7% increase)	15 to 16 min. (up to 7% increase)
Total Person Through-Put (peak hour/peak direction)	2,570 persons	2,600 persons	2,740 persons	2,780 persons
Intersection Levels of Service (a.m. peak hour)	4 at LOS E or worse	7 at LOS E or worse; 1 intersection improves over Baseline*	7 at LOS E or worse; 1 intersection improves over Baseline*	3 at LOS E or worse; 2 intersections improve over Baseline*
Intersection Levels of Service (p.m. peak hour)	2 at LOS E or worse	8 at LOS E or worse; 0 intersections improve over Baseline*	6 at LOS E or worse; 0 intersections improve over Baseline*	4 at LOS E or worse; 0 intersections improve over Baseline*

Characteristics are shown for the 2030 forecast year.

\* Delay must decrease by more than 20 seconds to be included

Capital cost estimates were developed for each of the Build Alternatives, and summarized for conceptual project budget purposes. The cost ranges shown in Table 1-3 represent investments in only those components that pertain directly to the proposed improvements. The estimates do not include items such as street reconstruction or utility relocation beyond that necessary to implement the transit Alternatives. Unit costs used to develop the estimates were based upon recently completed transit systems, escalated to year 2005 dollars, and modified as required for the transit investments envisioned for Columbia Pike.

Table 1-3 also presents the probable range of operating costs for the system. Note that the total net estimated operating cost of each Alternative includes a portion of the current background PikeRide service. The current annual cost of operating PikeRide services is approximately \$7 million. Each of the Build Alternatives would replace a portion of that service, resulting in a “savings” or a reduction in the amount of regular bus service required.

**Table 1-3: Summary of Costs by Alternative**

Cost Element	Baseline	BRT	Streetcar	Modified Streetcar (6 min.)
Length of Alignment	n/a	5.9 miles	5.9 miles	4.7 miles
Number of Fleet Vehicles	n/a	29	27	11
Total Estimated Capital Cost	\$28 million planned*	\$110 to \$120 million	\$185 to \$200 million	\$110 to \$120 million
Total Estimated Operations and Maintenance Cost	\$7.0M	\$8.2M over baseline	\$14.0M over baseline	\$5.4M over baseline

Estimated costs are shown in year 2005 dollars.

\* Funds committed to Columbia Pike improvements in the approved 2005 to 2010 Transportation Improvement Program.

The technical analysis shows that the Modified Streetcar Alternative would make more efficient use of the projected capital and operating expenditures than the initial Streetcar Alternative in the near term (prior to full build-out of Columbia Pike Initiative development plans). And, while the BRT Alternative would carry more passengers per unit of capital and operating expense, a Streetcar investment would respond more favorably to the project goals related to community and economic development.

## 1.6 Findings and Recommendations

Based on the analysis conducted and input received, the preferred Alternative for Columbia Pike should be a small-scale project that could be developed through local sponsorship and minimum federal participation. The project should be advanced in keeping with federal requirements so that it may be kept eligible for federal funding, either under the emerging Small Starts funding program, or within the New Starts funding program where an early local investment might be applied as the local match for a later, larger federal project.

The Pike Transit Initiative study team recommends that the Modified Streetcar Alternative be carried forward as the preferred Alternative into the next phase of the project development process (preliminary engineering and environmental review).

To advance the Pike Transit Initiative as a viable project, its sponsors should continue on a course that would keep the project eligible for Federal funding. This includes making application to FTA to begin the NEPA process which will also serve to sustain public and agency awareness of and participation in the project. Given the scale of the project it is appropriate to combine the NEPA process with preliminary engineering as provided in the New Starts project development process.

Since Federal funding is contingent upon many things, some of which are not under the control of project sponsors, project advancement should also continue independent of New Starts funding determinations. In addition to moving forward with preliminary engineering and environmental work, the project sponsors must proceed with financial planning activities. These will include identifying potential sources of funds and beginning to outline a realistic framework for how and when those funds could be committed. Potential funding partners, including public and private entities, should be included as participants in this process.