Columbia Pike Transit Initiative

Locally Preferred Alternative Report

July 16, 2012

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1.0 Overview

1.1 Introduction

Arlington County and Fairfax County, in coordination with the Federal Transit Administration (FTA), propose implementing high-capacity, high-quality transit service along a 5-mile corridor, running primarily on Columbia Pike, between the Pentagon/Pentagon City area in Arlington County and the Skyline area in the Baileys Crossroads Community Business Center in Fairfax County. The proposed project, known as the Columbia Pike Transit Initiative, supports the counties' transportation goals and fosters their vision for a multimodal corridor, linking its walkable, mixed-use, mixed-income neighborhoods and connecting these to the Washington, DC area transit network, and thus, the region's major activity centers.

This document presents the project team's recommendation that the Streetcar Build Alternative should be advanced as the Locally Preferred Alternative (LPA) for the project corridor. The recommendation is based on information documented in the *Columbia Pike Transit Initiative Alternatives Analysis/Environmental Assessment* (AA/EA); guidance from the project Policy Committee, Community Coordination Committee, and the Technical Advisory Committee; and, comments received during the public comment period (May 22, 2012- June 21, 2012) and at the two public meetings held on June 6 and June 7, 2012.

The rationale for the LPA recommendation is outlined below according to the following project elements and considerations:

1) Project background, purpose and need, goals and objectives; public comment and stakeholder involvement;
2) Preferred transit alternative and alignment, as documented in the AA/EA; and
3) Support for the LPA.

1.2 Background

In 2004, after recognizing the increased demand of the strong transit market, Arlington and Fairfax Counties initiated the Columbia Pike Transit Initiative and conducted a local Columbia Pike Alternatives Analysis to consider the development of an advanced transit system connecting the Pentagon/Pentagon City area to Baileys Crossroads. The study evaluated a wide-range of possible transit solutions, with consideration from agencies, stakeholders, and the public throughout the process. In 2006, the Arlington County Board and Fairfax County Board of Supervisors endorsed the "Modified Streetcar Alternative," a combination of streetcar and bus service, as the preferred alternative that best served the needs and fulfilled the vision of the corridor. The boards adopted this alternative due to its ability to increase transit capacity, improve mobility, and spur economic development along the corridor; subsequently, in 2008, the project was included in the Metropolitan Washington Council of Governments (MWCOG) Constrained Long Range Plan (CLRP). In 2008, due to the Supreme Court of Virginia decision invalidating local funding sources, the two counties decided to seek federal funding, thereby requiring a federally approved Alternatives Analysis.

Currently, the project is seeking federal funding for a portion of the proposed improvements through the FTA Capital Investment Grant Program (49 U.S.C. 5309) New Starts/Small Starts program. In order to meet the requirements of the program and maintain eligibility for federal funding, the project team prepared a combined AA/EA. The AA/EA compared the ability of four alternatives to satisfy the project purpose and need and analyzed the potential effects of the alternatives on the built and natural environment.

1.3 Purpose and Need

The purpose of the Columbia Pike Transit Initiative is to:

- Implement higher-quality and higher-capacity transit service in the corridor in order to provide additional transit capacity;
- Enhance access within the corridor and provide connections to the regional transit network; and
- Support economic development along the corridor.

Buses that operate in this corridor carry the most riders of any corridor in Northern Virginia, with an average weekday ridership of approximately 16,000 boardings per day.[1] Premium transit service would improve regional accessibility by enhancing the quality of transportation options along the corridor, which in turn, would make the corridor a more attractive location for redevelopment. In addition, enhanced transit would support Arlington and

[1] Washington Metropolitan Area Transit Authority, April 2010. Metrobus April P103 Report- Ridership by Line Route and Schedule Type. Arlington County, 2010. ART ridership data.

Fairfax Counties' vision for a mixed-use, walkable environment by offering a convenient, dependable, and frequent option for traveling the corridor without using an automobile, while also serving existing and future low-income and transit-dependent populations residing along the corridor. High concentrations of transit-dependent populations, or households with no vehicle, are clustered around Jefferson Street, in Pentagon City, and southeast of Four Mile Run.[2]

The need for the Columbia Pike Transit Initiative stems from existing and anticipated transportation problems along the corridor related to limited roadway and transit capacity to accommodate increasing travel demand as the population grows and development increases. Additionally, the Skyline area of the corridor is underserved by transit, which limits its regional connectivity. These problems and needs are summarized in **Table 1** and described below.

Table 1: Problems and Needs

Problem	Need
Limited roadway capacity to handle an increase in automobile trips.	• Improve transit capacity; and • Improve transit mode share.
Existing transit capacity is insufficient to support future growth and development within the corridor.	• Invest in transit service that supports growth and economic development.
Skyline, a regional center of office, commercial and residential activity, is poorly connected to the regional transit network.	• Improve transit access and regional connectivity to and from Skyline.

Continued population and employment growth will increase transportation demand along the corridor. According to MWCOG forecasts, population within a ¼-mile of the corridor is projected to increase by 21 percent from 2010 to 2030, while employment is projected to increase by 23 percent.[3] The population and employment growth (spurred by redevelopment) and operational improvements to existing transit service have generated a 45 percent increase in corridor weekday transit ridership since 2004. As land along the corridor continues to be redeveloped with medium- to large-scale mixed-use projects, and population and employment increases and development intensifies, the demand for transit will also increase. Assuming relatively minimal change to the distribution between commute and non-commute trips, anticipated baseline ridership growth of 16 percent is expected, adding another 80,000 daily trips to the corridor by 2030. The challenge for planners and decision-makers is to create places where as many trips as possible can be made by walking and to attract a greater number of people to use public transportation.

The Baileys Crossroads Revitalization Commercial District in Fairfax County and Arlington County's Columbia Pike Initiative have provided the necessary land use plans and zoning codes to encourage higher density redevelopment and a mix of land uses along the Columbia Pike corridor. These efforts have resulted in two major redevelopment projects in the Baileys Crossroads area of Fairfax County and six major residential redevelopment projects completed in the Arlington County portion of the corridor since 2002.[4] Additionally, ten projects, mostly mixed-use developments, are either under construction or approved along the overall corridor.

The continued success of redevelopment efforts is dependent upon a robust transportation system to connect the new developments with existing population and employment centers. Most critically, improved transit service will demonstrate a permanent and on-going commitment to transportation by the public sector. Sustaining and improving the level of transit service investment will benefit current corridor residents and businesses and encourage continued private investment that will support the growth of jobs, housing, and services in the corridor.

1.4 Goals and Objectives

Goals and objectives for the Columbia Pike Transit Initiative are shown in **Table 2**. The project goals and objectives are based on the problems and needs in the corridor and are consistent with goals of the regional long-range transportation plans. The project alternatives were evaluated on the basis of the project purpose and need and objectives.

[2] American Community Survey 5-year estimates, 2005-2010.
[3] Metropolitan Washington Council on Governments (MWCOG) Round 7.2a Land Use Projections.
[4] The six projects are the Halstead at Arlington, Siena Park, Gramercy at Metropolitan Park, Majestic Oak Townhouses, 55 Hundred, and Alcova Row, and in Fairfax, the Goodwin House renovation and Fairfield development.

Table 2: Project Goals and Objectives

Goals	Objectives
Improve mobility for corridor residents, employees, customers, and visitors.	• Provide additional transportation capacity to meet current and future travel demand. • Provide more transportation choices. • Provide high-quality service for local-corridor trips. • Address the transportation needs of the transit-dependent populations in the corridor.
Contribute to and serve as a catalyst for economic development.	• Support continued population and employment growth in the corridor. • Support county economic development initiatives. • Maximize local economic impact of transportation investments.
Enhance livability and long-term economic and environmental sustainability of the corridor.	• Support lifestyle choices for environmentally sustainable communities. • Support long-term private investment in transit-friendly development. • Minimize adverse environmental impacts of transportation investments. • Serve households at a range of income levels. • Promote pedestrian-and bicycle-focused communities.
Support the development of an integrated regional multimodal transportation system.	• Provide enhanced connections to intermodal centers. • Provide improved service to regional activity centers. • Increase transit ridership and mode share.
Provide a safe environment for all modes of travel.	• Enhance personal security for travelers in the corridor. • Provide safe operations for travelers in the corridor. • Provide a safe environment for transportation operations staff and employees.

1.5 Alternatives Considered

The project team worked with FTA to develop four alternatives, ranging in investment levels, that seek to address the transportation needs of the corridor. These alternatives are listed below and summarized in **Table 3**:

- **No Build**: Includes existing highway and transit networks, plus committed transportation improvements within the corridor.
- **Transportation Systems Management (TSM) 1 - Enhanced Bus**: Includes No Build improvements plus transit enhancements to focus bus service on high-density development along the corridor; consolidated bus stops; and more mid-day, late night, and weekend service.
- **Transportation System Management (TSM) 2 - Articulated Bus**: Includes No Build improvements and transit operations changes of the TSM 1 Alternative, plus higher capacity articulated buses on the 16G and 16H routes and off-vehicle fare collection and multi-door boarding to speed boarding and travel times. This alternative includes the proposed Jefferson Street Transit Center.
- **Streetcar Build Alternative**: Includes No Build improvements and transit operations changes of the TSM 2 Alternative, plus high capacity modern streetcars operating between Skyline and Pentagon City in place of the 16G and 16H bus routes. Streetcars would include off-vehicle fare collection and multi-door boarding and alighting. Standard buses would continue on other routes. This alternative includes the proposed Jefferson Street Transit Center.

Table 3: Characteristics of Alternatives

	No Build	TSM 1	TSM 2	Streetcar Build
Planned Service Enhancements	✓	✓	✓	✓
Increased Span of Service		✓	✓	✓
Consolidated Stop Locations along Columbia Pike		✓	✓	✓
Improved Service Coverage (to and from Skyline)		✓	✓	✓
Off-vehicle Fare Collection and Multi-door Boarding			✓	✓
Increased Vehicle Passenger Capacity			✓	✓
Full Program of Stop Upgrades (Including transfer center and near- level boarding)			✓	✓
Rail Vehicles and Associated Performance Characteristics				✓

1.6 Public and Stakeholder Involvement

Throughout the course of the project, Arlington County and Fairfax County officials and staff sought community and stakeholder input through outreach activities that were designed to engage and inform the public and stakeholders on project updates and meetings. Recent public outreach efforts focused on publicizing both the availability of the AA/EA for public comment and the public meeting dates, and encouraging people to submit comments. All project updates and materials have been posted on the project website, www.piketransit.com.

The public and stakeholders provided important input to the Columbia Pike Transit Initiative. Project team coordination with federal, state, and local agencies has also been integral to the process. The project team has closely coordinated with the FTA and regularly briefed the Virginia Department of Rail and Public Transportation (DRPT). Below is a brief list of selected outreach activities and meetings held since 2010:

- **Public Meetings:** Two public meetings were held in November 2010. Extensive outreach was conducted to inform the public about the meetings. The purpose of the meetings was to provide the public with an update on the progress of the project and to solicit input on the alignment, station locations, operations and maintenance facilities, existing conditions, and potential project effects. The comments that were received during the meetings were instrumental in helping the project team to develop, refine, and evaluate the study alternatives.
- **Technical Advisory Committee:** The Technical Advisory Committee (TAC) is comprised of representatives from federal, state, and local government agencies. Meeting periodically, their role has been to provide staff recommendations and advice on technical matters related to the project. Since 2010, the TAC has met three times.
- **Community Coordination Committee:** The Community Coordination Committee (CCC) is comprised of citizens, commercial and business interests along the corridor, and representatives of official advisory groups. Since 2010, the CCC has met three times.
- **Community and Stakeholder Meetings:** In addition to holding public meetings, the project team held numerous meetings and briefings with stakeholders and community groups. The project team has also conducted outreach activities for English as a Second Language (ESL) groups.

1.6.1 Public Comments on the AA/EA

Arlington and Fairfax Counties released the AA/EA to the public on May 22, 2012, initiating a 30-day public review and comment period to solicit feedback on the findings. During this period, the project team conducted two public meetings, held on June 6 in Arlington County and June 7, 2012, in Fairfax County. The majority of comments addressed the Streetcar Build Alternative, either in support or in opposition. Commenters who favored the Streetcar Build Alternative noted its ability to support economic development, provide a long-term transit solution, and support environmental sustainability. Commenters who opposed the Streetcar Build Alternative voiced concern over estimated costs, its potential to worsen traffic, and on its inflexibility. Commenters were also concerned about the counties' ability to retain affordable housing and requested that the project be put in a referendum for a vote. The Comment Summary Report (Appendix B) provides a detailed summary of the public meetings.

2.0 Locally Preferred Alternative

2.1 Alternative and Alignment

The project team recommends that the County Boards endorse the "Streetcar Build Alternative," defined in the Columbia Pike Transit Initiative AA/EA, as the preferred transit alternative. The proposed streetcar alignment, facilities, station stops, and supporting bus service are shown in **Figure 1** in Appendix A. The Streetcar Build Alternative would include both a modern streetcar service and continued bus service between Pentagon City in Arlington County and the Skyline area of Fairfax County. The streetcar alignment would run from Skyline along the length of Jefferson Street and Columbia Pike to Joyce Street and terminate in Pentagon City at 12th Street and South Eads Street. The streetcar route would follow the existing alignment of Columbia Pike near South Joyce Street, unless the proposed realignment of Columbia Pike moves ahead in advance of project implementation. All projects assumed under the No Build Alternative would be included in the Streetcar Build Alternative. **Table 4** summarizes the key features of the Streetcar Build Alternative.

Table 4: Key Features of the Streetcar Build Alternative

Characteristic	
Length	4.91 miles
Mode/Technology	Streetcars with supporting bus service (all buses are standard WMATA or ART buses)
Number of Stations	19 stop locations in each direction
Terminus Points	Western: Skyline (Route 7 design option); Eastern: Pentagon City
Number of Streetcar Vehicles	13
Operation	Streetcar vehicles would operate in mixed traffic within the outside travel lanes along Columbia Pike and in the inner lanes along Jefferson Street and through Pentagon City. Streetcar vehicles would operate in exclusive right-of-way on short segments near the western and eastern termini.

Average Weekday Service Frequency	• Skyline/Baileys Crossroads:
	  ○ Buses: 15 min. peak; 30 min. off peak
	  ○ Streetcars: 6 min. peak and off-peak
	• Along Columbia Pike: Buses/Streetcars: 2-3 min peak; 4 min. off-peak;
	  ○ To Pentagon:
	  ▪ Buses: 4 min. peak; 10 min. off-peak
	  ○ To Pentagon City:
	  ▪ Buses: 30 min. peak; 0 off-peak
	  ▪ Streetcars: 6 min. peak and off-peak

Hours of Service	Streetcar, Metrobus, and ART service would be provided along the corridor seven days per week. The Streetcar Build Alternative would provide streetcar service to more closely match Metrorail opening and closing times to provide connections to early and late Metrorail trains. • Weekday: 5:30 a.m. to 1:00 a.m. • Saturday: 6:30 a.m. to 1:00 a.m. • Sunday: 6:00 a.m. to 11:30 p.m.
Fare Collection	Off-vehicle payment and validation; on-board random inspection
Operations & Maintenance Facility	Pentagon City (along Eads Street between 12th Street and Army navy Drive)
Additional Facilities	• Jefferson Street Transit Center (with bus transfer and park & ride spaces) • Construction Staging and Equipment Storage Site • Five Traction Power Substations • Overhead Contact System (OCS)

2.1.1 Western Terminus Design Option

As documented in the AA/EA, the Streetcar Build Alternative includes three Western Terminus Design Options, including the Jefferson Street Transit Center Option, Skyline Central Plaza, and Skyline Route 7. **Figure 2** shows the three design options. The project team recommends adoption of the Skyline Route 7 design option for the following reasons:

- It satisfies the project and community goal of extending transit service across Route 7, close to the Skyline Complex; and
- It is generally supported by proximate stakeholders including Target Corporation and Vornado/Charles E. Smith.

The Skyline Central Plaza design option is opposed by Target Corporation and may require structural modifications to the Target Building. The Jefferson Street Transit Option does not fully satisfy the project and community goal of extending transit service across Route 7 to the Skyline Complex.

During the public comment period, Vornado/Charles E. Smith proposed a revision to the Skyline Central Plaza design option. This revised design option recommended moving the station platform closer to Route 7 in the vicinity of the existing main entrance to Skyline. This revised design option, referred to as "Skyline Main Entrance Option," falls within the same study area boundaries evaluated as part of the AA/EA document, which was approved by FTA for release to the public and made available to the public on May 22, 2012. **Figure 3** in Appendix A shows the proposed option. Over the last several months, Vornado worked with the counties and with project staff to examine the Skyline Main Entrance Option, including meeting with project engineers and the Virginia Department of Transportation on issues relating to Route 7. Vornado has also discussed this new option with Target Corporation, which owns property affected by all options but has access impacted by the Skyline Main Entrance Option. As planning for the project progresses, project staff will continue coordination with Target, Vornado, VDOT, and others (e.g. Northern Virginia Transportation Commission Route 7 multimodal study) and seek FTA guidance regarding any evaluation that may be required for this revised design option.

2.2 Vision of the Corridor

Over the past decade, Arlington County and Fairfax County have been actively engaged in efforts to strengthen communities, increase the amount of housing and amenities, and encourage a mix of land uses at key locations along the corridor. In 2002, the Arlington County Board approved the *Columbia Pike Initiative: A Revitalization Plan for the Corridor*. Part visioning exercise and part implementation plan, the board developed a vision for transportation and community development along Columbia Pike and identified steps towards achievement. Arlington County envisions Columbia Pike transformed from an auto-oriented to a pedestrian- and transit-oriented corridor. The plan envisions Columbia Pike as a "Main Street," with small activity nodes with mixed-use centers, linked by an enhanced transit system. The Fairfax County Board of Supervisors has developed a vision for the greater Baileys Crossroads area, reflected most recently in a 2010 Comprehensive Plan update that allows for greater land use densities and increased activity levels predicated upon a higher quality transit service. The vision for Baileys Crossroads Commercial Business Center is that of an attractive, diverse and vibrant mixed-use area, containing medium to high density residential uses for a range of income levels, and office, retail and recreational/cultural uses that are compatible with the surrounding neighborhoods. Both counties affirm that Columbia Pike, Baileys Crossroads, and Pentagon City are desirable locations for residents and business and recognize their vitality is reliant on implementation of a high-capacity, long-term transit system.

The counties' vision is founded on their commitment to environmental, social, and economic sustainability. Arlington County encourages and supports residents' "car lite" lifestyle by investing in high-quality transit service and bicycle infrastructure, and creating walkable communities. Along the corridor, the counties' commitment to sustainability is evident by the frequent, reliable transit service provided by both Arlington Transit (ART) and Metrobus. Currently, the Metrobus and ART bus routes on Columbia Pike operate at combined 2- to 3-minute headways during peak-hours. This high transit frequency limits the ability to improve service quality and reliability by simply adding more buses to the schedule, leading to bus bunching and decreased service reliability. Both Arlington County and Fairfax County need to implement a transit service that will provide higher-capacity and higher quality transit service to cope with underlying growth, and increase transit mode share while decreasing single-occupancy vehicle use along the corridor.

Columbia Pike is a mature transit corridor in need of a fixed-guideway transit solution to meet the current and future transit needs. The project team recommends the Streetcar Build Alternative as the alternative that will address the transit needs of the community and achieve the counties' vision of a transit-oriented and pedestrian-oriented corridor through:

- Increasing transit ridership and mode share;
- Improving walkability;
- Increasing livability;
- Serving both local trips and connecting to the regional transit network;
- Providing the greatest transit capacity and the greatest capacity for future expansion; and
- Sustaining economic vitality of the corridor.

2.2.1 Transit Ridership and Mode Share

Given the recent experience of other streetcar and light rail systems, the forecasted ridership estimates in the AA/EA likely underestimates the daily ridership for the Streetcar Build Alternative. The counties have experienced that higher transit ridership corresponds to an increase in the number of people walking and using transit for both local trips and commuting. The AA/EA states that the forecasted ridership under the Streetcar Build Alternative is

30,500 in 2030 and 28,900 for TSM 2.[5] The ridership forecast model is primarily based on travel time savings – as travel time savings increase, so does transit ridership. For both the TSM 2 Alternative and the Streetcar Build Alternative, the transit operation assumptions that lead to travel time savings are almost identical – both alternatives assume off-board fare collection and multidoor boarding. To calculate the total ridership for the Streetcar Build Alternative, the model applied a "mode specific" effect. FTA specified a 5 percent increase for the Streetcar Build Alternative ridership estimate relative to the TSM 2 Alternative. However, streetcar systems across the country have been exceeding forecasted ridership estimates, suggesting that a 5 percent increase in ridership for a streetcar does not represent the full ridership potential. Across the U.S., streetcars have proven themselves capable of attracting and retaining riders; the following streetcar/light rail systems have exceeded ridership projections:

- Portland initially projected 2,800 daily riders when the city's first line opened in 2001; today, the system is carrying over 10,000 riders per day.[6]
- Phoenix's recently opened light rail system projected 26,000 daily riders; actual daily ridership is over 33,000.[7]
- Hampton Road's light rail system, The Tide, projected 2,900 daily weekday trips when the city's line first opened in August 2011; actual ridership is averaging over 5,000 daily weekday trips.[8]

Findings of a 2009 Arlington County Resident Study Report[9] support higher ridership forecasts as well. Over the last few years Arlington County has collected travel survey data from residents along Columbia Pike through two surveys. According to the 2009 Resident Survey Report, 36 percent of residents use the current bus system at least once a week, while 64 percent of residents never use bus. When asked whether they would likely use the proposed streetcar, 59 percent of residents indicated that they would use it at least once a week.[10] This finding represents a dramatic shift in mode preference, further supporting that the 5 percent increase in forecasted transit ridership for the Streetcar Build Alternative over the TSM 2 Alternative is too low. The survey data are also important, given that over the past four years, Metrobus/ART ridership along the Pike has leveled-off (See **Table 5**). The lack of continued increase in ridership since "Pike Ride" was introduced in 2003 could indicate a larger theme: use of the current bus service along the Pike is reaching its peak. These results point to the need to implement a new transit mode for the corridor that will encourage people to use transit rather than drive. Given the experience from other streetcar systems across the country and Columbia Pike resident survey responses, the data indicates that a streetcar is the transit mode that will attract the most riders, increase the number of transit trips, and reduce vehicle miles traveled (VMT).

Table 5: Pike Ride Weekday Daily Ridership (2003-2011)

Fiscal Year	2003	2004	2005	2006	2007	2008	2009	2010	2011
Metrobus 16 Line	8,913	9,369	10,013	10,764	11,649	12,878	12,868	12,075	11,998
ART Bus 41, 45, 75	60	788	985	1,352	1,575	2,107	2,533	2,750	3,055
Totals	**8,973**	**10,157**	**10,998**	**12,116**	**13,224**	**14,985**	**15,401**	**14,825**	**15,053**

[5] The TSM 2 Alternative assumes off-vehicle fare collection and WMATA as the service provider. However, WMATA does not plan to introduce off-vehicle fare collection for Metrobus service before the project implementation year of 2017. Consequently, introduction of off-vehicle fare collection, the main contributor to the travel time improvement, would not be feasible without a change in WMATA policy.

[6] "L.A. Streetcar Fact Sheet" (2011). Accessed on June 25, 2012 from http://www.lastreetcar.org/wp-content/uploads/2011/02/Downtown.L.A.Streetcar_fact.sheets_2011.02.08.pdf

[7] Ibid.

[8] Messina, D. "Six-month-old Norfolk light rail beating expectations." (2012). The Virginian Pilot Online. Accessed on June 25, 2012 from http://hamptonroads.com/2012/02/sixmonthold-norfolk-light-rail-beating-expectations.

[9] 2009 Arlington County Resident Report. Accessed on June 27, 2012 from http://mobilitylab.org/wp-content/uploads/2012/03/2009-AC-Resident-Transportation-PRESENTATION.pdf

[10] 2009 Arlington County Residents Study (May 15, 2010). The survey asked for 5 and 10 minute headways, and received the same percentage from respondents. The proposed streetcar will operate at 6 minute headways.

2.2.2 Walkabilty

Across the country, streetcars are associated with place making and promoting walkable neighborhoods. Walkability has been at the forefront of smart-growth principles as it describes the ease of accessing a variety of retail, commercial, and public destinations by foot. Walkability is closely tied to the built environment, which includes both transportation and building developments. Transit often generates more walking trips, as local residents typically walk to and from transit in urban setting, and can "extend the walk area" by improving accessibility to commercial and retail areas. Walkable neighborhoods and transit-oriented development are associated with healthier communities, higher property values, and better access to services and amenities.

The 2010 Arlington County Household Survey found that Columbia Pike residents make the fewest walk trips compared to residents in the Rosslyn-Ballston corridor, Jefferson Davis corridor, and Shirlington.[11] The survey found that 73 percent of daily trips by Columbia Pike residents are made with automobiles; walking and transit trips constitute 13 percent and 10 percent of their daily trips, respectively. Given Arlington County's commitment to reducing its residents' dependence on automobiles and promoting healthy walkable communities, Arlington County is already taking measures to transform the streetscape and re-orient the built environment to support pedestrians. Throughout the Columbia Pike corridor, Arlington County and Fairfax County have continued to improve the pedestrian environment through streetscape improvement projects. The Columbia Pike Multimodal Project includes further plans for pedestrian and bicycle connectivity along the corridor that will complement the Streetcar Build Alternative and provide improved access to proposed transit stops. The building requirements under the form-based code, the recommendations described in *Streetscape Task Force Report* (2004), and implementation of the *Multimodal Streetscape Improvements Project* (2011), all support a more pedestrian-oriented environment. A streetcar system supports and enhances both counties' efforts to encourage walking trips by creating a sense of place and extending the walkability of the corridor, by making more areas accessible to pedestrians. The impact of a streetcar system on walkability is best communicated through this case study example:

> "In 2000, the intersection of 11th and Couch Streets behind Powell's Bookstore in Portland, Oregon, characterized as a 'tired and empty place on the industrial edge of downtown Portland,' logged an official count of 3 pedestrians there in a one-hour period. In 2005, after the Portland Streetcar arrived at a stop at 11th and Couch, and after the adjacent blocks were redeveloped with transit-oriented development, the pedestrian count total was 938 per hour."[12]

2.2.3 Livability

Transit's role in connecting residents to nearby and proximate retail and entertainment opportunities (fostering corridor interaction and accessibility) is reinforced by the fact that the average non-work trip length to and from the Corridor (within ¼ mile of the corridor) is 6.2 miles. If only trips within the corridor are considered, the average trip length is about one mile. Many of these very short auto-based trips are good candidates for walk and transit modes. Substituting walking- and transit-based trips for auto-based trips would yield a cost savings for residents who take these trips. Collectively, this would improve the livability of the Columbia Pike Corridor.

The Streetcar Build Alternative best supports livability along the corridor by providing the greatest travel cost and travel time savings among the alternatives. A review of housing and transportation affordability along the project corridor found that the majority of U.S. Census Block Groups in the corridor are currently within the affordable range, which is based on average household income – residents are paying less than 45 percent of their income on housing and transportation costs, as defined by the Center for Neighborhood Technology (CNT). As the region continues to grow, congestion levels increase, and housing and transportation expenditures rise, it is likely that the 45 percent threshold would be exceeded in areas along the corridor. This risk highlights the need for continued access to inexpensive public transportation for corridor residents, and the desire for Arlington County and Fairfax County to provide adequate affordable housing. The Streetcar Build Alternative provides $0.9M of annual travel

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[11] In 2008, MWCOG's regional household travel survey collected data on trip patterns (modes, time, purpose, location, etc.) of 11,500 households in the Washington metropolitan region. Arlington County paid for additional Arlington survey data, especially in the Rosslyn-Ballston corridor, Jefferson Davis corridor, Columbia Pike, and Shirlington. The Arlington data set includes 1,053 Arlington households and about 2,300 Arlington residents. Survey results available here: http://commuterpage.com/research/uploads/ACCS040/2010_Arlington_County_Household_Survey_PRESENTATION.pdf

[12] "Madison Streetcar Preliminary Feasibility Study." (2007). Accessed on June 25, 2012 from http://www.cityofmadison.com/planning/pdf/Streetcar-Report.Final.110907.pdf.

cost savings and $5.1 million of annual travel time savings for 2030. These travel cost savings help maintain affordability and can help offset rising housing costs.

2.2.4 Local trips and Connection to the Regional Transit Network

Given the speed and operation in mixed-traffic, streetcar systems are intended to support short, local trips and to connect various activity centers. The 2010 Arlington County Household Survey found that a quarter of all trips taken by Columbia Pike residents are less than two miles. This fact, coupled with the projected population and employment forecasts as well as the additional 6,000 residential units called for under the proposed *Columbia Pike Neighborhoods Area Plan* and 4,000 residential units in *the Baileys Crossroads Plan*, indicates the counties' need to decrease the amount of local automobile trips. As evident from experience across the country, a streetcar is the mode that encourages residents who previously drove to use transit for local trips and adopt a transit-oriented lifestyle. This mode shift will decrease regional VMTs, support healthy communities, and decrease automobile congestion. In both 2016 and 2030, the project team found that the Streetcar Build Alternative would lead to daily reductions of 16,000 VMTs and 19,000 VMTs (or about 3,000 cars), respectively.

The Streetcar Build Alternative will not only provide high-quality intra-corridor trips, but also provide enhanced connections to the regional transit network by improving corridor travel time and increasing service frequency. The corridor is uniquely positioned, anchored by two, high-density activity centers: Skyline and Pentagon City. The proposed station stops at the eastern end connect riders to key employment and commercial centers in the region including, the Pentagon, Pentagon City, Crystal City, and to the Metrorail. At the western end, the Skyline Complex includes over 2.6 million square feet of office space, with 10,000 workers; and 4,000 residential units, with over 8,000 residents. The Streetcar Build Alternative provides the greatest corridor travel time savings from Jefferson Street to Pentagon City and increased service frequency to Skyline. Additionally, the alternative proposes the Jefferson Street Transit Center, which includes bus bays and a park-and-ride lot. This transit center will allow travelers who cannot access station stops by foot to park and then connect using the streetcar to key locations along the corridor or to the Metrorail.

As one of the largest tenants in the greater Washington DC area, the General Services Administration (GSA) has acknowledged that more people will take rail transit over buses, and routinely restricts its searches for new office space to buildings in close proximity to rail stations;[13] Consequently, for Skyline to thrive economically and attract tenants for its large office buildings, the Skyline complex needs to be connected to rail and include a station stop. Failure to connect Skyline to rail could hinder Skyline's economic vitality and envisioned growth.

2.2.5 Transit Vehicle Capacity and Transit System Capacity

The Streetcar Build Alternative provides the greatest transit capacity and the ability to accommodate future transit system capacity expansion. Streetcars provide greater capacity than articulated buses, and a streetcar system would be the most apt to accommodating growth in ridership. As a fixed guideway system, the Streetcar Build Alternative could add significant passenger capacity with little increase in operating costs by replacing buses with higher-capacity streetcar vehicles. In the future, capacity could be increased further— again with little increase in operating costs—through the use of larger-format vehicles or multiple-car consists.

Because of its capacity to accommodate growth, and because of the permanent nature of its guideway and facilities, the Streetcar Build Alternative would exert the greatest long-term leverage to create and sustain walkable, mixed-use, mixed-income neighborhoods.

2.2.6 Economic Vitality

Return on Investment Study

As reflected in the *Return on Investment Study* (ROI), the Streetcar Build Alternative is the high-quality investment necessary to sustain the economic vitality of the corridor. Arlington County and Fairfax County commissioned the ROI to evaluate how land values and uses would change with implementation of the Streetcar Build Alternative compared to the other alternatives. The ROI gathered information through a variety of means, including a review and analysis of the literature describing how transit investments affect economies, direct analysis of the corridor through analysis of data and planning documents, and through interviews and a workshop with developers and key stakeholders. The literature indicates that streetcar projects that connect underdeveloped or underutilized areas with the larger region offer significant opportunities for redevelopment, property premiums, and increases in property tax revenue receipts.

The potential economic development impacts from improved mobility include:

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[13] GSA Requests for Proposals for space in the National Capital Region include the Requirement that 'Offered space must be within 2,640 walkable linear feet of the Metro Rail station." Retrieved on June 30, 2012 from https://www.fbo.gov/index?s=opportunity&mode=form&id=f39b6355ca32482f46fb06f18efe6a14&tab=core&_cview=0

- **Property Premiums:** A range of property premiums was applied to parcels adjacent to the corridor, ranging from a conservative 4% to a maximum of 10%. The increase in property value associated with the range is $126.2 million to $315.6 million in 2011 dollars. The property tax revenues that result from the increase in property value at the same range in premiums would be $36.5 million to $91.2 million ($ 2011) over a 30-year period.
- **Acceleration in the Pace of Development**: The presence of the streetcar would increase the pace of development by an estimated 2.0 to 3.5 years. This would result in increased value to developers and additional property tax revenues.
- **New Development in the Counties:** Just as the streetcar would increase the value and pace of development in the corridor, it will also increase the development intensity. A 10% increase in development intensity was applied to the share of development that is net new to the corridor and counties, resulting in $1,005.9 million in building stock over what is project to take place in the corridor over time, translating into an addition $156.2 million in property tax revenue over a 30 year period at 2011 rates.
- **Additional Tax Revenue:** Additional tax revenues can be expected of about $82.8 million over a 30 year period in 2011 dollars across a variety of tax types, such as business and professional licenses, retail sales, and other business taxes associated with the incremental gain in commercial activity due to the streetcar.
- **Additional Public Benefits.** In addition to the property-related impacts, the streetcar's implementation would generate a variety of public impacts including travel time savings, avoided injuries, a cleaner environment and travel cost savings that make the cost of living in the corridor more affordable. All combined, these benefits total $252.9 million ($ 2011) over a 30 year period.

Affordable Housing

Affordable housing is currently a concern in both counties and along the project corridor. Between 2000 and 2010, rents in the corridor increased 59 percent, while the average annual wage earned in the metropolitan labor market increased just 45 percent. The ROI affirmed the findings in the AA/EA- that the projected increase in property values associated with the streetcar investment will likely add pressure to rents (even as it supports owners) and affordability. However, both counties are proactively studying and working to preserve affordable housing along the corridor. Arlington County recently published *The Columbia Pike Neighborhoods Area Plan* (pending approval July 2012); the plan examines existing policy directives to encourage preservation of existing market-rate affordable housing units and presents new policy directives, financial tools, and strategies to provide affordable housing in new development along the corridor. The plan would also commit Arlington County to preserving 100% of affordable housing units currently in the corridor. In Fairfax County, the County's Workforce Housing Policy states that workforce housing should be provided in those areas of the County where the Comprehensive Plans envision mixed-use or high-density residential development above the baseline recommendations. The Baileys Crossroads area, as a mixed-use center, is subject to this policy recommendation. As a result, any residential development at higher intensities would be expected to incorporate affordable housing and/or workforce housing units. Both the ROI Study and Neighborhoods Area Plan identify additional tools to help preserve and support affordable housing within the corridor.

Although the streetcar investment will likely increase property values and pressures on affordability, providing high quality multi-modal transit with improved access to jobs and services in a corridor with a large stock of affordable units represents best planning practices for coordinating land use and transportation, and forms the successful, sustainable community. Families living in a walkable neighborhood with a good mix of uses and good access to public transportation can save 16 percent in travel costs over living in an auto-oriented environment, according to a report by the Center for Transit-Oriented Development entitled "Realizing the Potential: Expanding Housing Opportunities Near Transit."[14]

2.3 Environmental Impacts

The Environmental Assessment (EA) examined the potential effects of each alternative in all areas of the human and natural environment to determine what areas might be affected and to what extent. The EA concluded that for some environmental resource areas there would be no effect or negligible effects, including energy, protected species, geological resources, wild and scenic rivers, navigable waterways, and wetlands. The EA found that the TSM 2 and Streetcar Build Alternatives would have either positive or minor adverse effects on a number of resource areas, including transportation, land use, zoning, consistency with local plans, land acquisitions, neighborhood and community facilities, environmental justice communities, economic development, visual and aesthetic conditions, cultural resources, parklands, air quality, noise and vibration, water resources, contaminated

[14] As reported in TOD 201: Mixed-Income Housing Near Transit: Increasing Affordability With Location Efficiency. The Center for Transit-Oriented Development.

materials, safety, construction impacts, and secondary and cumulative effects. Most of these effects were related to or occurred in areas of significant construction activity. Importantly, the EA concluded that none of the alternatives would have any adverse impacts that could not be addressed through mitigation or minimization.

2.4 Evaluation of Alternatives

Chapter 5 of the AA/EA evaluates the alternatives based on their ability to address the project purpose and need and goals and objectives. The Streetcar Build Alternative best satisfies the project needs and goals and objectives. **Tables 6** and **7** below synthesize the findings.

Table 6: Evaluation Synthesis: Project Needs

Project Needs	Measures	No Build	TSM 1	TSM 2	Streetcar Build
Increase transit capacity and improve transit mode share	• Transit system capacity • Person throughput (2016 and 2030) • Transit ridership (2016, 2030) • Transit mode share • Regional VMT reduction	◔	◑	◔	●
Invest in transit service that supports growth and economic development	• Travel time savings • Travel cost savings • Premium property values (increase) • Permanence of investment (ability to attract investment)	◔	◑	◔	●
Improve connectivity and transit service to and from Skyline	• Intra-corridor trips: frequency of transit service that serves Skyline to Pentagon or Pentagon City • Additional facilities to improve transit connectivity and access • Corridor travel time (peak period, weekday ridership: to Skyline (trip production))	◔	◑	◔	●

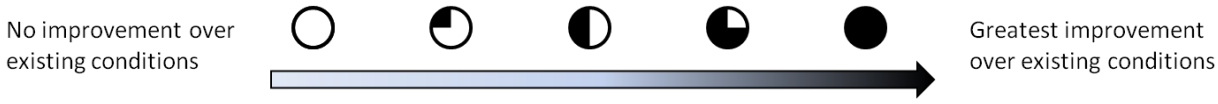
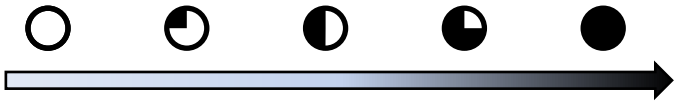


Table 7: Evaluation Synthesis: Project Goals

Project Goals	Objectives	No Build	TSM 1	TSM 2	Streetcar Build
Improve mobility for corridor residents, employees, customers and visitors.	• Provide additional transportation capacity to meet current and future travel demand. • Provide more transportation choices. • Provide high-quality service for inter-and intra-corridor trips. • Address the transportation needs of the transit-dependent populations in the corridor.				
Contribute to and serve as a catalyst for economic development.	• Support continued population and employment growth in the corridor. • Support county economic development initiatives. • Maximize local economic impact of transportation investments.				
Enhance livability and long-term economic and environmental sustainability of the corridor.	• Support lifestyle choices for environmentally sustainable communities. • Support long-term private investment in transit-friendly development. • Minimize adverse environmental impacts of transportation investments. • Serve households at a range of income levels. • Promote pedestrian and bicycle focused communities.				
Support development of an integrated regional multimodal transportation system.	• Provide enhanced connections to intermodal centers. • Provide improved service to regional activity centers. • Increase transit ridership and mode share.				
Provide a safe environment for all modes of travel.	• Enhance personal security for travelers in the corridor. • Provide safe operations for travelers in the corridor. • Provide a safe environment for transportation operations staff and employees.				

Rating Legend:

Marginally Satisfies Goals and Objectives



Fully Satisfies Goals and Objectives

2.5 Next Steps

This section describes the next steps required by the project team as it prepares to begin preliminary engineering. As discussed previously, the project is completing the necessary requirements to maintain eligibility for federal funding. Before applying for entry into Preliminary Engineering/ Project Development as part of FTA's New Starts/Small Starts program, the project must provide evidence of "Basic Project Readiness." The required materials and status of these materials are listed in **Table 8** (below) adapted from "FTA's Small Starts Application Checklist":

Table 8: FTA Small Starts Application- "Basic Project Readiness" Materials Status

Reporting Item	Required Information	Status
Alternatives Analysis Report	Final Report	AA/EA released for public review May 2012.
Selection of the Locally Preferred Alternative and Adoption into Constrained Long Range Plan	Proof of local action	Pending Board Action, July 2012. Project is currently included in Constrained Long Range Plan.
Agreement on Baseline Alternative	FTA concurrence	Completed.
Initial Information for Before and After Study	Ridership and cost inputs and estimates	Completed.
National Environmental Policy Act (NEPA) scoping (as appropriate to the NEPA Class of Action)	Scoping report or memorandum evincing completion	NEPA Class of Action of EA, recommended October 2009. AA/EA released for public review May 2012.
Evidence of Sponsor Technical Capacity	Preliminary Project Management Plan, and/or other materials	In progress by Arlington County and Fairfax County staff.

2.5.1 Project Commitments

Upon entry into New Starts/ Small Starts Preliminary Engineering/Project Development, the project team will prepare a NEPA Finding for FTA review and approval that would support continued project development and eligibility of the project for federal funding. **Table 9** (below) summarizes the key project commitments documented in the AA/EA that will need to be addressed in subsequent planning and engineering phases.

Table 9: Project Commitments

Topic	Related Sections of the AA/EA	Streetcar Build Alternative
Noise Analysis	Vol. I, Section 3.10; Vol. II, Section 9 Engineering Plans	• During the design phase of the proposed Operations & Maintenance facility when specific activities and locations of required equipment are identified, a more detailed noise analysis is recommended. • Upon selection of a rail vehicle and final design of streetcar track and systems, a detailed assessment of the potential for wheel-related noise impacts should be conducted at the following locations: ○ 12th Street & Eads Street (entrance to proposed maintenance facility) ○ Columbia Pike & Joyce Street ○ Columbia Pike & Jefferson Street
Hydrologic & Hydraulic Analysis	Vol. I, Section 3.12 Vol. II, Section 11 Engineering Plans	• Hydraulic analysis may be required for the placement of expanded pier footings within Four Mile Run. The project will continue coordination with Arlington County, DEQ, and FEMA to determine appropriate analysis, if required.
Archaeological Testing	Vol. I, Section 3.8 Vol. II, Section 7 Engineering Plans	• During subsequent phases of design, archaeological testing would be conducted and coordinated with VDHR for areas identified as archaeologically sensitive along the study corridor.

Topic	Related Sections of the AA/EA	Streetcar Build Alternative

Utilities	Engineering Plans	• Coordinate with utility owners and with other ongoing projects in the study area to:
		  ○ Identify utilities that could be affected by implementation of the alternative, and
		  ○ Develop applicable utility modification designs or approaches.

Parks	Vol. I, Section 3.9	• Coordinate with Arlington County regarding temporary effects on Four Mile Run Trail and Glencarlyn Park due to necessary improvements to Four Mile Run Bridge. • Coordinate with the NVRPA regarding temporary effects on W&OD trail/property due to necessary improvements to Four Mile Run Bridge.
Public Involvement	Vol. I, Section 6.0	• Continue public involvement and outreach with affected communities and stakeholders.
Transit Operations	Vol. 1, Section 3.1	• Coordinate with WMATA on off-vehicle fare transactions and on-board enforcement by proof-of-payment
Right-of-Way coordination	Vol. I, Section 3.3 Vol. II, Section 4 Engineering Plans	• More specifically define limits of right-of-way needs. • Coordinate with potentially affected land owners.
Construction-related Documents	Vol. I, Section 3.15 Engineering Plans	• Develop a coordination plan that details the interface between the implementation of the alternative and other ongoing projects in the study area, including but not limited to Super Stops, Multimodal roadway improvements, Columbia Pike realignment at the Navy Annex, Washington Boulevard Interchange reconstruction, and 12th Street South reconstruction. • Develop appropriate stormwater, erosion and sediment control plans for construction activities. • Develop a list of construction related permits required for project facilities. • Develop maintenance of traffic plan for in-street track and systems construction.
Pentagon City Metrorail Station	Vol. I, Section 3.15 Engineering Plans	• Conduct an adjacent construction analysis to ascertain effects of the streetcar station and line upon the underground Metrorail station and line.
Jefferson Street Transit Center	Vol. I, Section 3.15 Engineering Plans	• Continue the coordination with property owners, tenants, and stakeholders on the reconstruction of existing parking lot.
Skyline Area Design Option	Vol. I, Section 3.1	• Continue coordination with property owners and stakeholders on the Skyline station and alignment and their structural elements.

Appendix A: Figures

Figure 1: Streetcar Alignment and Facilities with Background Bus Route Network

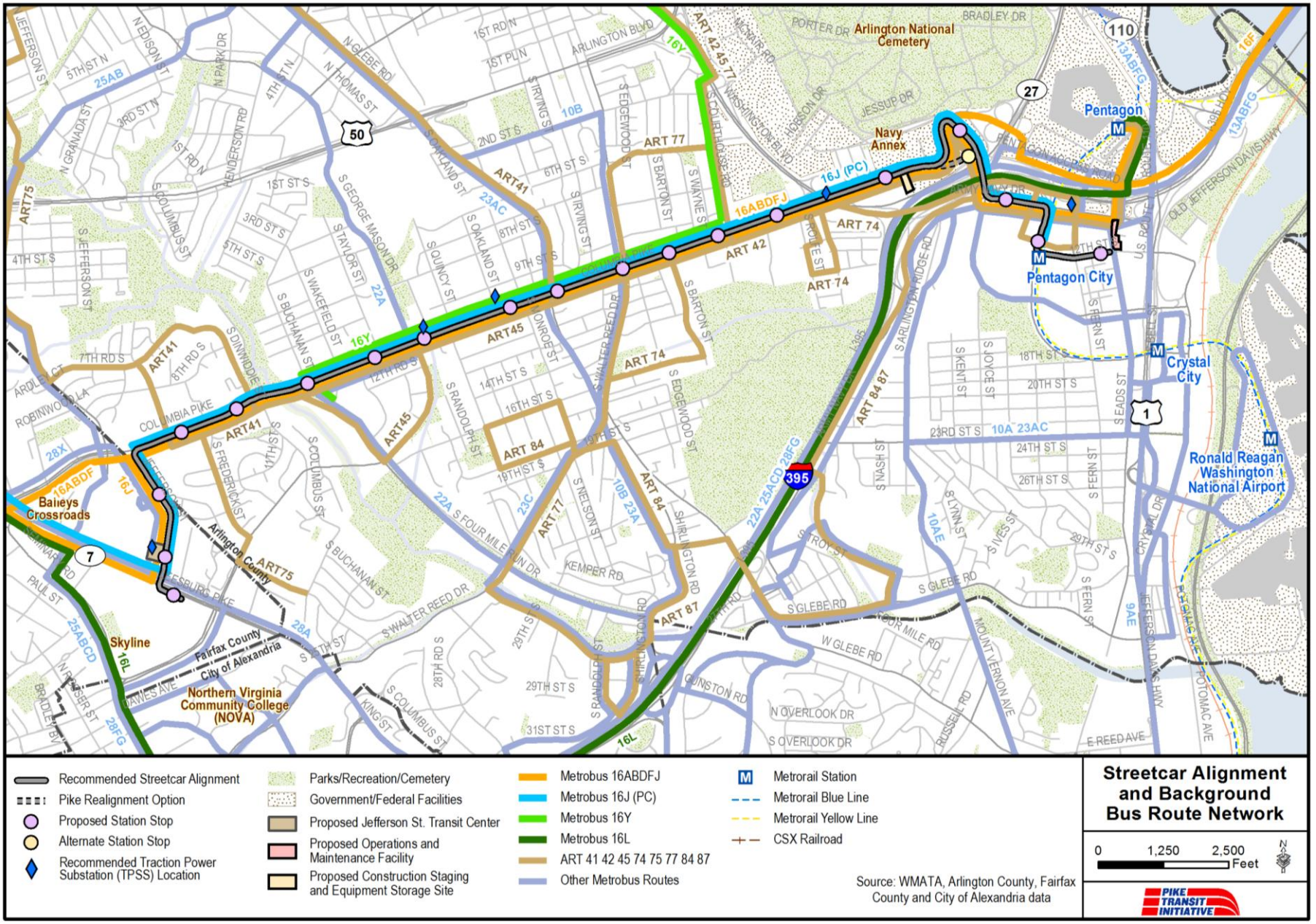


Figure 2: Western Terminus Design Options

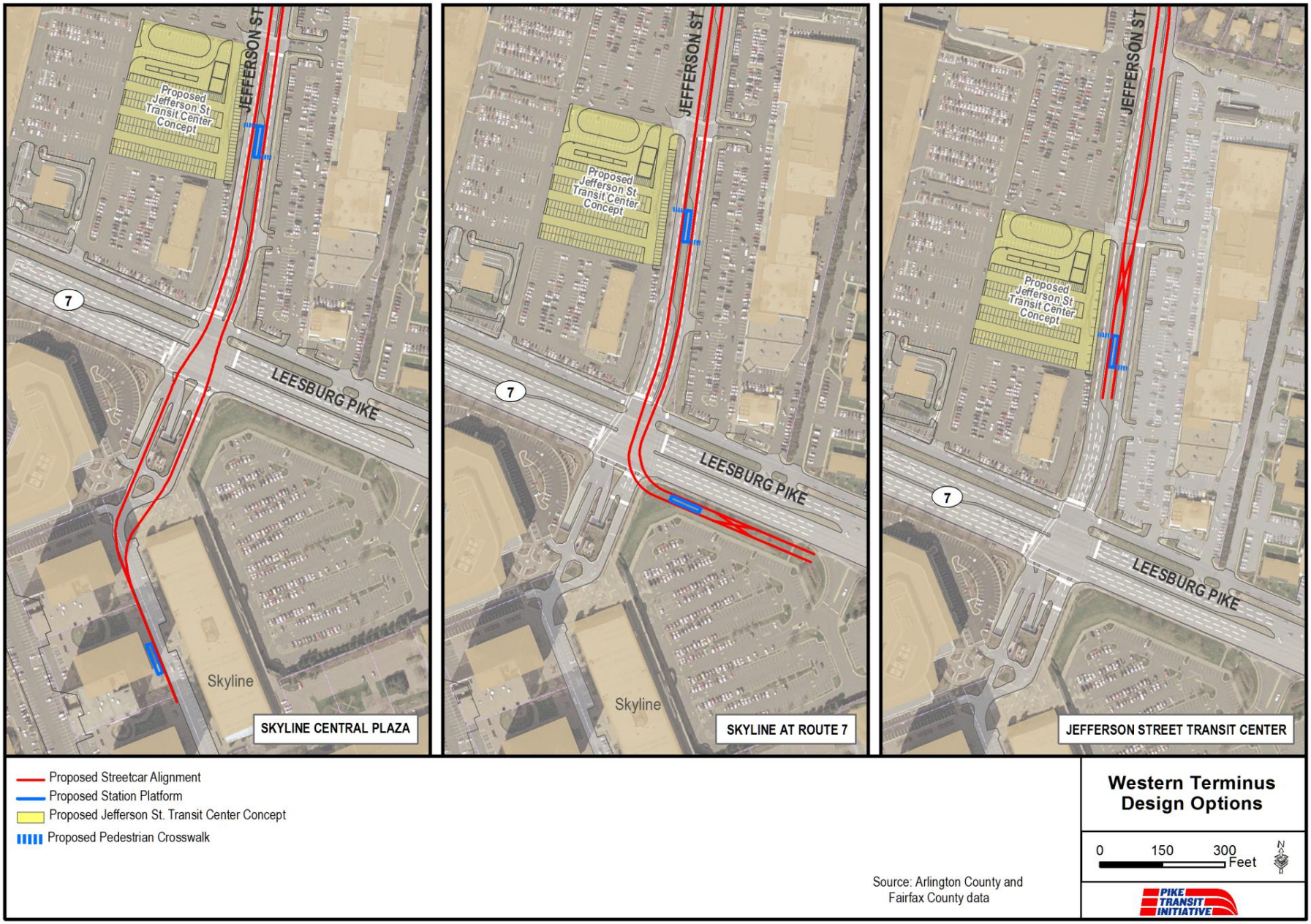
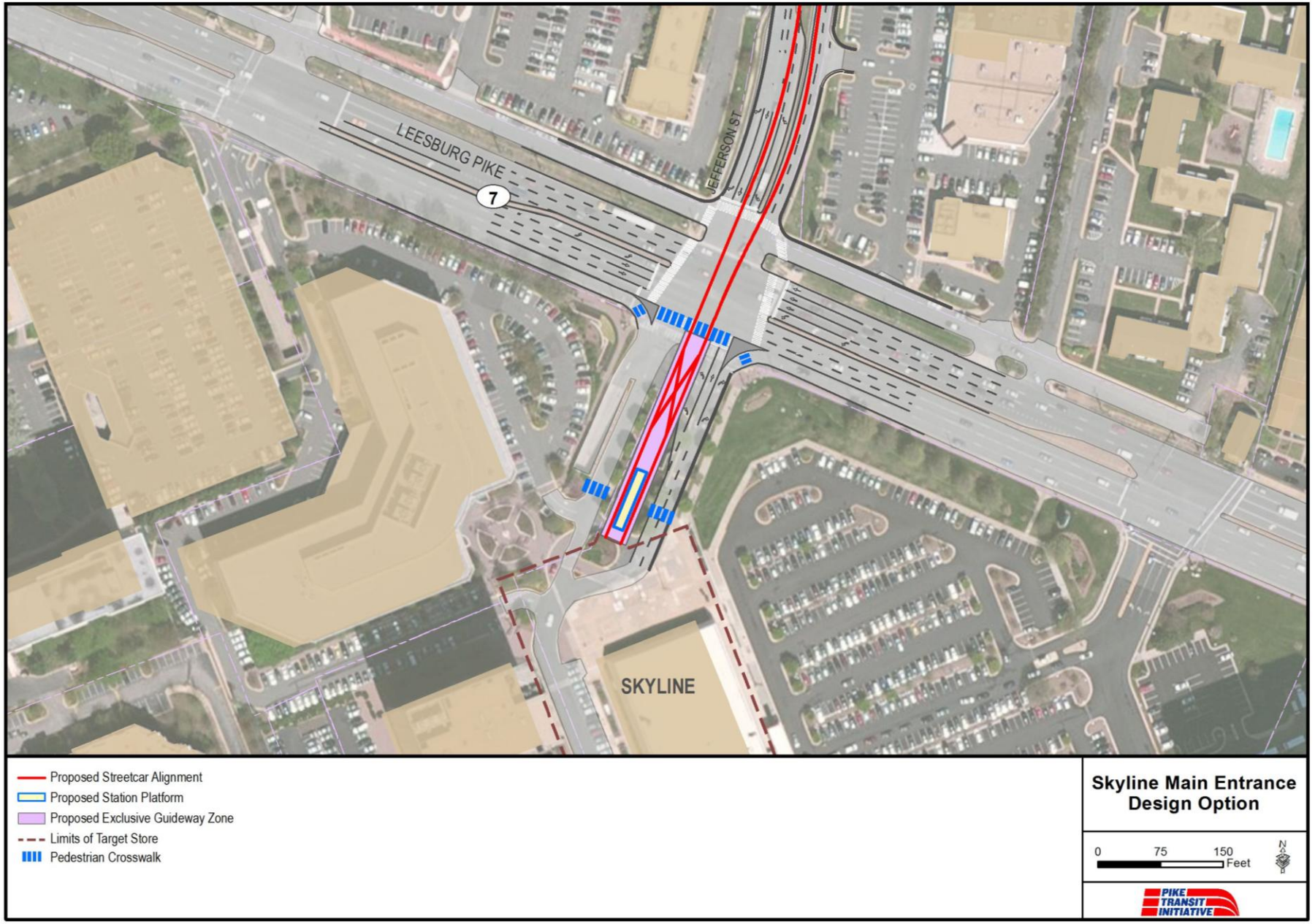


Figure 3: Skyline Main Entrance Option



Appendix B:
Overview of Public Comments on the AA/EA

Columbia Pike Transit Initiative

Overview of Public Comments on the Alternatives Analysis/Environmental Assessment

July 16, 2012

1. Introduction

On May 22, 2012, Arlington County and Fairfax County, in coordination with the Federal Transit Administration, released the Columbia Pike Transit Initiative's Alternatives Analysis/Environmental Assessment (AA/EA) for public review and comment. Notice of the availability of the document was provided via ads in local newspaper publications, posted flyers along the project corridor, a direct mailing, and through widespread email distributions. Examples of these notices as well as locations of where the documents were made available are provided in the Appendix. The AA/EA was posted on the project website www.piketransit.com, provided at the public meetings, and made available at:

- Local libraries;
- Arlington County and Fairfax County Government offices; and
- WMATA Headquarters.

The document was available for agency and public review and comment between May 22, 2012 and June 21, 2012. Comments were received through the project website, at public meetings (written and oral), emails to the project website, and the U.S. Postal Service.

Two public meetings were held to present the findings of the document and to answer questions related to the document. One meeting was held in Arlington County and the other was held in Fairfax County. Details on the format of these meetings are provided below.

This document provides an overview of the two public meetings and summarizes the general nature of the comments received during the formal comment period (May 22, 2012 – June 21, 2012) on the AA/EA. The first section provides an overview of the format of the public meetings, distributed materials, and meeting attendees. The second and third sections summarize the comments received, including how comments were received and the subject of the comments. Responses to comments are not provided in this document; however, all responses will be provided in the FTA environmental finding document.

2. Public Meeting Summary

2.1 Format and Meeting Materials

Arlington County and Fairfax County held two public meetings on the AA/EA on:

- June 6, 2012 at Patrick Henry Elementary School , Arlington County; and
- June 7, 2012 at Goodwin House Baileys Crossroads, Fairfax County.

As advertised, the meetings started at 7:00 p.m. and both meetings were identical in format. The public meetings included a thirty minute open house with project information boards and project staff available to answer questions, followed by a thirty minute presentation given by the respective county project manager and consultant staff, and concluded with a moderated question and answer session (Q&A). John Dittmeier of the Washington Metropolitan Area Transit Authority (WMATA) moderated the Q&A. The Q&A extended until all attendees wishing to speak had an opportunity to do so.

Upon arrival, and throughout the meeting, attendees were asked to sign in and were provided with project-related materials including an official comment sheet, a "Frequently Asked Questions" handout, an "Executive Summary," and a "Public Involvement" summary. Many of the project

notifications and materials were also translated into Spanish. All distributed meeting materials, the presentation, and the exhibit boards can be found on the project website.

In addition, attendees were provided an opportunity to register to speak during the moderated Q & A session; alternatively, attendees could also submit their question or comment to be read aloud by the moderator. Any elected public official wishing to speak was provided an opportunity to speak and allowed five minutes. General public participants were allotted three minutes to comment or ask the panelist technical questions on the AA/EA findings.

2.2 Attendees

The first meeting was held at Patrick Henry Elementary on June 6 from 7:00-10:00p.m. The second meeting was held at Goodwin House Baileys Crossroads from 7:00-9:30 p.m. Table 1 and Table 2 summarize the meeting attendees.

Table 1: Patrick Henry Elementary School – June 6, 2012 (7:00pm-10:00pm)

I. Public attendees	159
Registered Speakers	32 (2 did not speak)
Elected Officials	1 (Delegate Alfonso Lopez, 49th District and PC member)
Media	1 (Patricia Sullivan, Washington Post)
FTA Staff	2 (Dan Koenig; Melissa Barlow)
DRPT Staff	0
Spanish Translation Services Requested	0

Table 2: Goodwin House Baileys Crossroads – June 7, 2012 (7:00pm- 10:00pm)

II. Public attendees	109
Registered Speakers	18 (2 people spoke twice, so 16 individual speakers)
Elected Officials	1 (Supervisor Penny Gross, Fairfax County BOS Mason District and PC member)
Elected Official Aides	1 (Sam Bosch, Aide to Senator Adam Ebbin)
Media	1 (Steve Thurston, Arlington Mercury)
FTA Staff	1 (Melissa Barlow)
DRPT Staff	2 (Amy Inman, David Awbrey)
Spanish Translation Services Requested	0

3. Comment Submission

During the 30-day comment period, comments were received through U.S. Postal Service mail, e-mail, comments received at the public meetings and through the project website. Table 3 summarizes how the project team received comments. The project team received comments from 264 individuals. Each comment submission was person was given a unique commenter identification number. Each comment received was reviewed and sorted into categories. In many cases comments covered multiple topics; in the sorting process staff identified and categorized over 800 comments.

Table 3: Comment Submission Summary

Comment Submission Method	Number of Comment Submissions
Mail to P.O. Box/Letters	7
Email to Piketransit.com/Online Comment Forms	230
Comment Forms	20
Oral Comments at Public Meetings	48
Other	4

4. Overview of Comments Received

The comments received are summarized by category below. Within each "category" several topics have been identified. A preliminary overview of the sentiments expressed by these comments is provided, and a PDF of all comments received is posted on the project website. In the coming months, it is anticipated that the Federal Transit Administration (FTA) will prepare an environmental finding related to the Alternatives Analysis/Environmental Assessment. The environmental finding document will include formal comment summaries and responses.

4.1 Category: Alternatives

Many of the comments received related to the alternatives presented in the AA/EA. A common theme among this category was a concern that a decision on an alternative has already been made. Many expressed that the selection on the Locally Preferred Alternative (LPA) should be put to a vote.

Some commenters expressed that the No Build Alternative would be the most cost effective and is the only real solution at this time. The existing bus service is sufficient and commenters would rather see money spent to improve upon the existing bus system. Others felt that the No Build Alternative would not address the growing needs of the corridor and would not be beneficial to the environment. More buses will likely make the rush hour problems worse, with more buses bunching up and blocking lanes.

Many commenters were in favor of TSM 1 and TSM 2 because these alternatives seem more realistic because buses would provide more flexibility and connectivity, are more environmentally-friendly, and these options could be implemented more quickly. They also felt that the TSM 1 and TSM 2 provide a transportation solution at a much lower cost while achieving many of the same project goals as the Streetcar Build Alternative. Commenters also noted that development along the corridor is happening without a streetcar investment.

Conversely, some commenters stated that the bus alternatives will not meet the future needs and therefore expressed their support for the Streetcar Build Alternative. Reasons commenters supported the Streetcar Build Alternative include:

- Provide better service
- Support Economic Development
- Support Livability and the Counties' Vision
- Environmentally "clean" option
- Increase transit ridership and transit options
- Improve traffic
- Best for long-term
- Increase capacity
- Provide high-quality local trips
- Most Cost Effectiveness/Life Cycle Analysis
- Benefits of rail
- Reduce travel times

While some commenters expressed their support for the Streetcar Build Alternative, others stated that they did not support the Streetcar Build Alternative for the following reasons:

- Cost
- Not a wise use of taxpayer money
- Construction impacts on businesses, mobility
- Streetcars are inflexible, they cannot change routes if a problem occurs, such as a streetcar breakdown, illegally parked cars in mixed traffic/streetcar lane, broken down cars
- Streetcar performance in inclement weather
- Potential effects of economic development on affordable housing
- Potential for accidents

- Potential for conflicts with pedestrians/bicyclists
- It would not provide improved travel times if there is no dedicated right-of-way
- It would make traffic worse further degrading air quality.

Other commenters proposed various other mode alternatives to include subway, monorail, elevated train, or underground Metrorail, citing that these modes would alleviate the need for mixed use travel lanes and these options would better alleviate traffic congestion. Another preference was stated for a hybrid-electric or electric bus fleet.

Other general themes expressed by commenters in the "Alternatives Category" include, but are not limited to:

- Inadequate analysis and evaluation of alternatives
- Capacity
- Ridership
- Transit fares
- Other options to expand bus service/provide "Express Buses"/Bus Rapid Transit (BRT)/ or articulated and/or double-decker buses

4.2 Category: Alignment

The AA/EA presented three design options for the western end of the corridor in the vicinity to Skyline. Commenters noted that full potential of Skyline would not be realized until the area is served more directly by transit. There was a mix of preference for the Central Plaza, Route 7 and Jefferson Street options. The major property owners at this location are the Target Corporation and Vornado. Target representatives indicated a preference for the Route 7 design option, but with reservations about loss of visibility to the store, parking and decreased level of service. Vornado stated a preference for considering both the Route 7 design option and a new design option that would be centered at the main entrance to the Skyline complex ("Skyline Main Entrance Option").

Several comments were received on why the project alignment does not extend to the Northern Virginia Community College while other comments stated support for the alignment to be expanded into Alexandria and Washington, DC.

4.3 Category: Costs/Funding

Many commenters expressed opinions regarding the capital costs and potential funding for the project. The primary sentiment is opposition to the streetcar based on the perception the streetcar investment is too costly, that it's a waste of taxpayer money, and financial resources could be better spent. Some expressed concern about the effect of the project on their taxes. Commenters also expressed concern over the doubt/uncertainty of state and federal funding, the ability of the project to qualify for federal funding and what would happen if those funding sources do not materialize. Others expressed opinions on how the project might be funded by considering special taxing districts. Some also wanted to better understand proposed cost allocations between the jurisdictions.

Long-term operations and maintenance costs were also a concern. Commenters stated that the upkeep and maintenance of buses is likely cheaper than for streetcar and associated facilities. Some wanted to understand how these maintenance costs would be paid for.

Fares and fare collection were also brought up by commenters. Some are concerned about potential fare increases and the validity of assuming off-vehicle fare collection for the TSM 2 Alternative when the project has also indicated that WMATA would likely not implement off-vehicle fare collection. Others were concerned that higher fares for streetcar would reduce passenger use, and people would continue to use their private vehicles.

4.4 Category: Engineering and Construction

Several commenters expressed concern over construction methods; duration of construction; unexpected utilities or hazards beneath the street; the amount of disruption construction of the streetcar alternative would cause to businesses along the corridor; and effects on mobility. They also questioned if compensation would be given to those businesses affected by construction. Commenters also expressed concern over the construction effects associated with the re-grading of Jefferson Street, overhead wires/catenary system, and disturbing the historic boundary marker along Jefferson Street. Some felt that construction effects were not adequately addressed in the AA/EA.

4.5 Category: Facilities/Vehicles

Commenters expressed concern over the Traction Power Substations (TPSS), stating that the power source is not environmentally friendly, that TPSS sites would be visually obtrusive and pose potential health risks, and that land assumed for a TPSS should be considered for park uses.

Comments regarding potential facilities associated with the alternatives included the following themes:

- Proximity/location of the TSM 2 Operations & Maintenance (O&M) facility to the corridor
- Capacity of the O&M facilities
- Preference for North Tract as streetcar O&M facility
- Jefferson Street Transit Center interference with revitalization of Bailey's Crossroads area
- Loss of parking at Bailey's Crossroads shopping center
- Station features and accessibility, particularly with ADA requirements

Comments regarding vehicles included the following themes:

- Propulsion and type of streetcar vehicle to be used - comments ranged from suggesting the use of battery operated streetcar vehicles to the use of an electro-mechanical streetcar system
- Seating capacity
- Delivery schedule for new streetcars versus new articulated buses with three doors

4.6 Category: Environment

Several comments were submitted regarding the project's effects on the environment. They are summarized below by resource area:

- **Air Quality:** There were suggestions to use natural gas buses instead of streetcar because it is perceived that they would be better for the environment than streetcar. The Streetcar will cause congestion, delays, and will be bad for air quality. However, several others felt that the project would be good for improving air quality.
- **Energy and Greenhouse Gases:** Some felt that the EA does not adequately address the effects of the project on energy and greenhouse gases.
- Aquatic and Riparian Habitat: When building the streetcar alternative, extreme care should be taken in strengthening the Four Mile Run bridge to as to not to negatively impact the aquatic and riparian habitat in the area or the recreational opportunity provided by the Four Mile Run Trail.
- **Cultural Resources:** There was concern over the historic boundary marker in the median of Jefferson Street and how the project was going to deal with that resource.
- **Noise and Vibration:** Commenters noted that wheel squeal is a known problem with streetcars, and that noise and vibration issues are undesirable effects of the Streetcar Build Alternative. Some commenters expressed concern that articulated buses would result in increased noise, and questioned how the noise analysis found no impacts for the articulated buses in the TSM2 Alternative, but did find impacts for streetcar vehicles, which are generally quieter than buses. A few comments questioned the methodology used to evaluate noise and vibration.

- **Visual and Aesthetics:** Commenters expressed concern over the visual elements of the Streetcar Build Alternative, specifically overhead wires and traction power substations. Commenters noted that Arlington County has recently undergrounded utilities along Columbia Pike, and questioned re-introducing overhead wires with the Streetcar Build Alternative. Commenters also requested that the traction power substations be designed to be aesthetically pleasing.

4.7 Category: Economic Development

Comments concerning economic development referred to the following four topics:

- **Affordable Housing:** Commenters are concerned that affordable rents (and the residents who depend on them) will be driven out with the anticipated increase in property values. Commenters believe that the developers/land owners will be the beneficiaries and residents will not benefit to the same degree. A concern is that taxes will increase to raise funds to pay developers to keep affordable housing. Other topics that were of interest to respondents: the effect on Section 8 housing, the population of students receiving food assistance on the corridor, and the projected income and demographic compositions.
- **Development:** Of the comments in support of the Streetcar Build Alternative, some believed that it may entice more people to get out of their cars and would have a faster, higher level of economic success than a bus system. Some believe that the corridor will not redevelop without the permanence of a streetcar line, but that the amount of development is speculation and that developers may not be as attracted to the corridor as expected due to the local demographics. The commenters who are neutral or against the streetcar feel that it is an expensive way to spur development, especially when redevelopment is already happening without the streetcar.

A commenter was concerned with overbuilding in the County leading to increased crime, congestion, and expensive parking. A commenter was concerned that additional infrastructure (for example: schools) will need to be built if the streetcar attracts the scale of development expected. Another was concerned that the streetcar build option would take decades to break even at the assumed rate. A request was to know whether there was more information on how rail transit can attract more development than bus.

- **Economic Development:** Comments supportive of the Streetcar Build Alternative expressed belief that the streetcar would cause an increase in development and property values, bringing in higher tax revenues for the counties and adjacent landowners, and spurring higher quality developments. An untapped residential opportunity is Crystal City - only 3% of the workers there live on Columbia Pike and the streetcar would make the two areas more accessible.

Of those who are skeptical or against the streetcar, a concern is that the economic development is speculative at best and ignores that comparable systems used tax increment financing (TIF) and other subsidies to finance the projects. It is unclear what Arlington County gains economically from the connection to Skyline. Additionally, a concern was expressed that it may not be equitable for all of Arlington County's residents to pay taxes for a service that will benefit a small number of riders over the bus alternatives, and will benefit the already wealthy landowners. Some residents prefer a slower pace of development.

- **Return on Investment:** Commenters stated that they see no economic benefit from a streetcar alternative. They also requested that the referenced Return on Investment Study be made available for public review, and it was suggested that it cover all of the alternatives. One positive result would be the increased connectivity to the transit network, saving people money and worry over car ownership.

4.8 Category: Transportation

Comments on transportation concerned the following:

- **Existing Bus Service/Buses:** Commenters were concerned about disabled and older residents getting to transit stops. Others wanted to know how bus stops would be improved and if the 16G and 16H buses would be replaced. A commenter suggested consideration of different types of high capacity buses.
- **Parking:** Build commuter parking garages along the line and/or provide frequent shuttle service to commuter parking lots with amenities for waiting passengers. On-street parking should be significantly reduced and limited along many segments of Columbia Pike in the study area. When new buildings are built, any required parking should be provided by the developer, not by on-street parking. Increased parking supply does not promote transit use. On-street parking can conflict with the flow of streetcar vehicles in particular and buses.

4.9 Category: Capacity and Ridership

Regarding capacity, commenters indicated that the existing capacity along the corridor seems sufficient and that they do not understand how the streetcar would increase ridership. It was further stated that the claim (need for more capacity) for this project does not exist.

Comments regarding ridership estimates included the following:

- The FTA model underestimates streetcar ridership and the validity of the ridership estimates is questionable.
- What percentage is mode preference and does the model take into account the upcoming changes in the silver and orange lines?
- What is the current versus future density of the population if ridership is increased from Skyline by 4000 cars?
- What is the estimate of riders that would come from Crystal City to Skyline during rush hour to work?
- How many additional riders would transfer from Metro trains to a trolley instead of a bus?
- Explain the basis for ridership estimates.

4.10 Category: AA/EA Document

Some comments stated that the AA/EA does not adequately evaluate the environmental effects of all feasible alternatives, while others questioned whether the process was indeed complete. Some comments questioned the methodologies employed for the assessment and others had questions about particular analysis. One comment emphasized the Federal Telework program as the alternative most likely to reduce commuting in personal cars.

4.11 Category: Public Involvement

Comments relating to public involvement generally were in reference to the process around the public meetings, providing comments, and providing an open dialogue for public input. One commenter stated that they were not well informed of the public comment period. A commenter asked about being able to orally provide comments during the public meetings. One commenter raised concern about the ability to submit comments when using public computers due to no security box or number at the end of the comment page, and some commenters were surprised not to see any Arlington County Board members at the June 6 public meeting. Yet another commenter was concerned that minority groups were not given adequate opportunity to be involved in the process, and claimed that minority groups were prevented from attending the meetings that were held on June 6 and 7.

4.12 Category: Other

Other comments submitted concerned whether there would be an independent assessment of the evaluation and how independence from the County Boards would be established. One commenter was a

local contractor and wanted to know why his calls have not been returned regarding his offer of services to construct the project. Another commenter stated that improvements need to be made at the intersection of Columbia Pike & South Jefferson Street before the project is constructed.

Appendix C:
Return on Investment Executive Summary

Columbia Pike Transit Initiative
Return on Investment Study
July 16, 2012

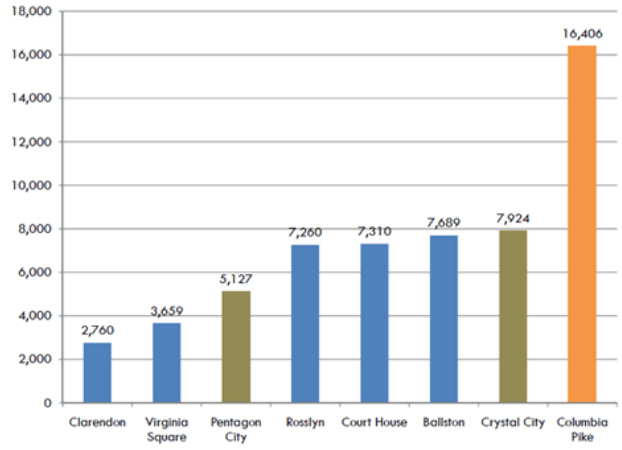
Executive Summary

Columbia Pike is a vital corridor that serves as a critical gateway between Northern Virginia and the District of Columbia. Over the past decade the formerly low-density, auto-dependent corridor has been steadily transforming. Arlington and Fairfax Counties have been actively working with the neighborhoods along the corridor to articulate a long-range vision for how they would like this transformation to unfold, and the policies and investments needed to realize their vision. The Columbia Pike Transit Initiative is thus one outcome of a decade's worth of planning work on the part of community residents and county planning staffs.

Columbia Pike has the largest stock of housing in Arlington County (**Figure ES-1**). While Columbia Pike has significant retail space in its own right, with a terminus at Pentagon City the streetcar route would serve a significant share of Arlington's retail stock as well (**Figure ES-2**). The segment of the corridor in Fairfax County serves a similar retail and residential role, anchoring the eastern portion of Fairfax County. The private and public investments made over the next ten years are long-term investments that will measurably shape the future of the corridor and the counties for many years beyond.

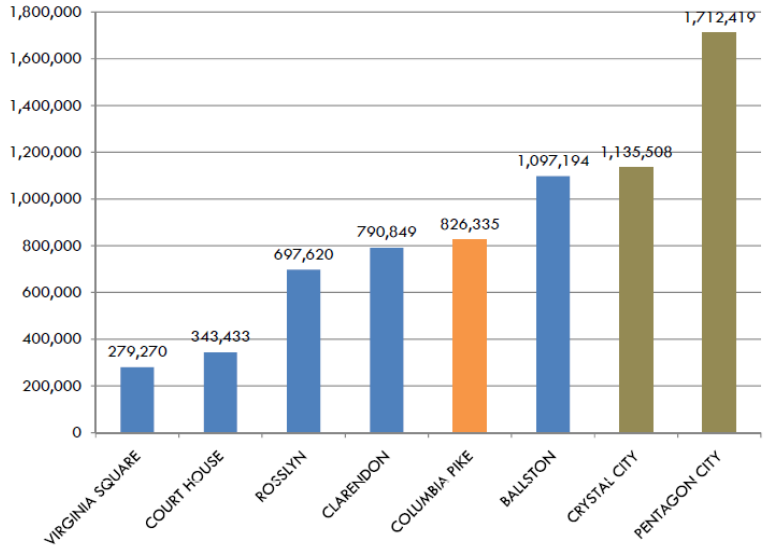
Building on the work of community residents and county staff over the past decade to articulate a vision for their community, the current phase of planning for the corridor's transportation future focuses on environmental analysis and associated engineering work to select the alignment and mode of transit that best meet the community's need and fulfill its vision. Economic analysis in the Alternatives Analysis/Environmental Assessment (AA/EA) and in the anticipated Federal Transit Administration (FTA) New Starts/Small Starts funding application addresses the question of how land values and uses would change with implementation of the Streetcar Build Alternative compared to the other alternatives. Understanding this effect is helpful in evaluating whether to make the investment and in articulating the potential benefits to stakeholders and the general public. In addition, understanding what policies and regulatory changes could be made in concert with the physical infrastructure investment is important to ensure that Arlington County and Fairfax County receive the maximum economic development return on their streetcar investment.

Figure ES-1: Estimated Stock of Residential Units in Arlington County



Source: Arlington County Present and Future, August 2011; Census Bureau, April 2010.

Figure ES-2: Estimated Stock of Retail Square Feet in Arlington County, August 2011



Source: Arlington County Present and Future, August 2011; CPHD, Planning Division, Planning, Research, and Analysis Team (PRAT). As of August 8, 2011.

1.1 Process

The Return on Investment (ROI) Study gathered information through a variety of means, including review and analysis of literature describing how transit investment affects economies, direct analysis of the corridor through analysis of data and planning documents, and interviews with developers and key stakeholders. Thus, the approach builds on past work, and combines data analysis with hands-on experience of "what works" in fostering economic development in order to offer an assessment of the counties' return on their proposed streetcar investment.

Data

Data regarding the current and forecasted population, employment, and household growths were obtained from the Metropolitan Washington Council of Governments (MWCOG) Rounds 8.0 (current) and 8.1 (proposed for adoption) forecasts. Projections of residential unit growth from Arlington County's *Neighborhoods Area Plan* were used to supplement the MWCOG projections. Parcel and property data from the counties' real estate assessments were analyzed to identify property values and the tax base for properties adjacent to the project corridor. The counties provided square footage and unit estimates for current and planned retail, commercial, residential, office, and hotel uses and for remaining development capacity. Travel demand forecasts from the AA/EA document were used to understand how transit ridership could be affected by the new streetcar mode.

Literature Review

The literature describing property market outcomes in other locations was reviewed. Nearly all of the studies reported that streetcar projects in their city had a positive effect on the city's built environment. However, the significance of the effect varied greatly by city, property type, and study area limits (such as adjacent, ¼ mile, etc.). A range of 4 percent to 12 percent for studies estimating the potential impacts of new streetcar service. Areas that were more focused on residential development were in the lower part of that range; areas more concentrated in office development tended to be in the higher part of the 4 to 12 percent range.

Online Survey

An online survey was constructed to determine developers' perceptions regarding economic development activity with and without a transit improvement along the corridor. The survey was

designed to understand the developers' assessment of the corridor's market potential. It was distributed to 53 developers in the region who have either previously developed along the corridor or could in the future, depending upon the transit improvements. The survey had a response rate of 41 percent (22 of the 53 surveys were completed). Respondents represented a variety of property types and scales, which provided broad coverage of the development community. The response rate was high enough to offer a representative sample of the developer community, and valuable feedback was obtained, particularly through the comments sections.

Interviews

Four interviews were conducted with two developers, an affordable housing representative, and a planning and zoning expert from Arlington County. The interviewees were selected to ensure that the study considered the perspectives of developers that anchor each end of the corridor, and that the issues, determined to be important to the study area, were discussed. The two developers interviewed included Simon Properties, owners of Pentagon City Mall at the eastern terminus of the corridor, and Vornado/Charles E. Smith, owners of both the Skyline development at the corridor's western terminus, as well as the property of the proposed Operations & Maintenance (O&M) facility in Pentagon City. As Columbia Pike has traditionally been an affordable area for residents, Arlington County has set ambitious goals for retaining the affordable housing stock despite the anticipated new market-rate developments. Understanding how the affordable housing goals will affect development patterns and developer incentives provided by the counties is an important consideration for the study. A similarly important aspect of the corridor's future development outcomes is Arlington County's Form Based Code (FBC). New developments within the nodes of Columbia Pike are encouraged to develop under the FBC; the FBC aims to control the look and size of development, not function. Developers are guaranteed a faster approvals process for following the FBC's guidelines in exchange for a cohesive look and, in select cases, affordable housing or historical property concessions.

Developer Workshop

A developer workshop was held on the morning of April 18, 2012. The purpose of the workshop was to review key survey results, solicit feedback, clarify results, and validate the key findings for outcomes that can be expected with and without transit investments in the corridor. Nine developers (representing a mix of commercial and affordable housing property types) attended the two hour workshop, as well as staff from both counties and the Executive Director of the Columbia Pike Revitalization Organization (CPRO). During the workshop, the developers were asked to provide their opinions on the property premiums; type, quality, timing, and locations of developments; and any county policies or issues that affect how or when development might take place along Columbia Pike and Baileys Crossroads. The guidance provided by the developers at the workshop helped finalize key assumptions applied in the empirical analysis. In particular, the developers narrowed the range of potential impacts identified in the literature review to a range of 4 to 10 percent.

1.2 Return on Investment Study Findings and Recommendations

The streetcar's operation will offer travel cost and time savings to residents and workers in the corridor, as well as improve the accessibility of the community to the larger regional transit network through the connection with Metrorail. Transit's role in connecting residents to nearby and proximate retail and entertainment opportunities (fostering corridor interaction and accessibility) is supported by the pattern of trips in the corridor; the average non-work trip length for person trips to and from the Corridor (within ¼ mile of the corridor) is 6.2 miles. If only trips within the corridor are considered, the average trip length is about ½ mile. Thus, many of these very short auto-based trips are good candidates for walk and transit modes. Substituting walking- and transit-based trips for auto-based trips would yield a travel cost savings for residents who take these trips. Collectively, the travel time savings would improve the livability of the Columbia Pike Corridor. The market's response to the associated improvement in quality of life translates into economic development along the corridor.

Development Impacts

The economic development impacts from the improved mobility are anticipated to include:

- Property premiums for properties immediately adjacent to the alignment
- Opportunity for an increase in the pace of corridor revitalization
- Opportunity for new development investment to the counties

Estimates of each type of impact are provided in **Table ES-1**.

Property Premiums. Based on the literature review and information provided by the developer community, the market is anticipated to capitalize the improved accessibility and connectivity in the property values of the parcels adjacent to the alignment. Based on the collective guidance from the literature and developers, the study applies a 4 percent premium, recognizing that this premium is in the low part of the projected range. This assumption is consistent with that applied in the AA/EA document. The upside risk of this assumption is that if the 4 percent assumption is wrong, it is likely to underestimate the potential outcome—that properties in the corridor appreciate to a greater degree. Accordingly, an upper bound of 10 percent is also estimated—slightly lower than findings from the literature but consistent with developers with local first-hand knowledge of the corridor. Moreover, the analysis concentrates on those properties that are directly adjacent to the corridor as this is where the impact is most likely to occur and would be most pronounced. Property impacts in adjacent parcels are estimated, albeit at more modest percentages given the increased distance from the investment as an additional means to provide an upper bound on the size of the potential impact. Much of the literature finds that the property premium effect is experienced up to a quarter mile from the streetcar's actual route.

Applying the 4 percent premium to just those parcels directly adjacent to the proposed streetcar alignment yields a minimum $126.2 million increase in value, which translates into an additional $1.2 million in property tax revenue annually at 2011 rates. The 30-year gain in tax revenue from this 4 percent premium is $36.5 million in 2011 dollars. The equivalent values at 10 percent are $315.6 million increase in value, which translates into an additional $3.0 million in property tax revenue annually, yielding roughly $91.2 million in property tax revenue over the 30-year horizon. This is summarized in **Table ES-1**, below, which also provides the discounted values of the tax revenue stream at 3 percent and 7 percent. Discounting restates a stream of revenues as a net present value, recognizing the opportunity cost of having to collect the revenues gradually over a long period of time.

Acceleration in the Pace of Development. While there was general consensus among survey respondents and the developers who attended the workshop that the pace of development would quicken, the potential gains are small—offering a few years of additional tax revenues at most. Nearly all respondents agreed the number of years of acceleration would be more than one year but less than five, simply because of the lead time needed to start construction. Given the uncertainty concerning the degree of acceleration, several scenarios are estimated here; one where projected development that is directly attributable to the streetcar occurs 2 years faster than without the streetcar and one where projected development occurs 3.5 years faster. One additional scenario was evaluated—that is that the introduction of the streetcar accelerates ALL new development in the corridor (not just new development attributable to the streetcar) by 2.0 years and 3.5 years. The results of each of these acceleration scenarios (net of the baseline revenues collected) are reported in **Table ES-1** in base year 2011 values, as well as discounted at 3 and 7 percent.

New Development in the Counties. Recognizing that many factors come into play in the development decision, and that the percentage of net new development cannot be estimated with precision, a 10 percent increase in development intensity is applied as the share that is net new to the corridor and counties. Applying the 10 percent increase in development intensity to projected corridor development yields an additional $1,005.9 million in building stock over what is projected to take place in the corridor over time, translating into an additional $156.2 million in property tax revenue collections over a 30 year period at 2011 rates.

Additional Tax Revenues. Beyond the direct property tax revenues associated with new development, the additional commercial activity associated with the acceleration of building activity and the additional development in the corridor would generate additional tax steams in the form of retail sales, business and professional licenses, and other associated business taxes. The additional revenues associated with these other taxes represent revenues of about $82.8 million (2011) across a variety of tax types.

Table ES-1: Summary of Projected Property Impacts

Line	Type of Impact	Millions $2011	Discounted @3	Discounted @7
	Property Premium			
1	Value Created by Property Appreciation @4% (properties directly adjacent to the alignment)	126.2		
2	Value Created by Property Appreciation @10% (directly adjacent to the alignment)	315.6		
3	Tax Revenue Generated @4% (total 30 yrs)	36.5	20.6	10.8
4	Tax Revenue Generated @10% (total 30 yrs)	91.2	51.4	26.9
	10% Net New Development Over and Above Projected Baseline Growth			
5	Value of New Building Stock Added to the Corridor	1005.9		
6	Tax Revenue Generated by the New Stock Added to the Corridor (total 30 yrs)	156.2	90.3	47.9
	Value of Accelerating Development in the Corridor (net over baseline)			
7	Tax Revenue Generated by Accelerating Projected Development ***Attributable*** to the Streetcar by 2 Years (total 30 yrs)	16.1	9.8	5.5
8	Tax Revenue Generated by Accelerating Projected Development ***Attributable*** to the Streetcar by 3.5 Years (total 30 yrs)	20.2	12.3	6.9
9	Tax Revenue Generated by Accelerating ALL Projected Development in the Corridor by 2 Years (total 30 yrs)	161.2	98.2	54.9
10	Tax Revenue Generated by Accelerating ALL Projected Development in the Corridor by 3.5 Years (total 30 yrs)	201.6	122.7	68.7
	Business and Other Non-Property Taxes Associated with Expansion of Business Activity in the Corridor			
11	Associated with the Value Created by Property Appreciation @4% (total 30 yrs)	0.0	0.0	0.0
12	Associated with the Value Created by Property Appreciation @10% (total 30 yrs)	0.0	0.0	0.0
13	Associated with New Building Stock Added to the Corridor (10% above projected growth) (total 30 yrs)	82.8	47.9	25.4
	Total Increase in Value of Corridor Building Stock			
14	Value of Property Appreciation (@4%) plus Value of New Building Stock Added to the Corridor (1+5)	1132.1		
15	Value of Property Appreciation (@10%) plus Value of New Building Stock Added to the Corridor (2+5)	1321.5		
	Total Increase in Tax Revenues (Property and Associated Non-Property Taxes)			
16	Tax Revenue Associated with Property Premium (4%), New Stock Added to Corridor, Non-property Tax Revenues, and Acceration of Projected Development Attributable to Streetcar by 2 Years (3+6+7+13)	291.6	168.5	89.6
17	Tax Revenue Associated with Property Premium (4%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of Projected Development Attributable to Streetcar by 3.5 Years (3+6+8+13)	295.7	171.0	91.0
18	Tax Revenue Associated with Property Premium (10%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of All Projected Development in Corridor by 2 Years (4+6+9+13)	491.5	287.7	155.2
19	Tax Revenue Associated with Property Premium (10%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of All Projected Development in Corridor by 3.5 Years (4+6+10+13)	531.8	312.3	168.9

Notes: Line 3: Extending the radius beyond the adjacent parcels to those located within ¼ mile adds another $34.6 million in tax revenues over the 30-year analysis period. The estimate assumes that the premium impact diminishes with distance and applies just half or a 2% gain to the properties beyond those directly adjacent.
Line 4: Extending the radius beyond the adjacent parcels to those located within ¼ mile adds another $86.5 million in tax revenues over the 30-year analysis period. The estimate assumes that the premium impact diminishes with distance and applies just half or a 5% gain to the properties beyond those directly adjacent.

1.3 Public Benefits and Risks

Throughout the study, two themes repeatedly arose: the ability to develop at greater density than permitted by Arlington's FBC, and concerns regarding affordable housing. Although raised independently, the two can be connected.

Density and Existing Zoning. Participants in the developer workshop voiced repeated concern that Arlington County's existing FBC would not provide sufficient density for them to build to a scale that would capture the full potential of the corridor. The developers recognized that the FBC permits greater density than under traditional zoning, but they still felt that the code is a constraint. The allowable density in the corridor was a greater concern than affordable housing requirements. The requirement for additional density was not uniform along the corridor but was focused on particular opportunity sites. The impetus for greater density was driven by both market potential but also commercial feasibility given affordable housing requirements, parking, building costs, and other costs of development. One of the points of greatest consensus in the developer workshop was the recommendation that Arlington County consider updating the FBC. Fairfax County does not face the same constraints.

Affordable Housing. The second concern regarding streetcar implementation was the potential loss of affordable housing. Arlington County's *Columbia Pike Neighborhoods Area Plan* found that the corridor is already losing its stock of affordable housing, as there is the potential for the projected increase in property values associated with the streetcar investment to add pressure to rents (even as it supports

owners). The potential is greatest in Arlington where rents in the corridor increased 59 percent even without streetcar implementation while the average annual wage earned in the metropolitan labor market increased just 45 percent between 2000 and 2010. Pressures on housing affordability are less pronounced in Fairfax County. The affordable housing issue is more complicated, however, than a simple property appreciation issue. On the one hand, streetcar investment will likely increase property values and pressures on affordability. On the other, providing high quality multi-modal transit with its easy access to jobs and services in a corridor with a large stock of affordable units such as Columbia Pike corridor represents best planning practices for coordinating land use and transportation, a foundation for a successful, sustainable community. Living in a walkable neighborhood with a good mix of uses and good access to public transportation can provide a 16 percent travel savings over living in an auto-oriented environment, according to a report by the Center for Transit-Oriented Development entitled "Realizing the Potential: Expanding Housing Opportunities Near Transit. " The AA/EA prepared for this project concluded that streetcar travelers who diverted from cars would save $25.0 million over the 30-year analysis horizon.

Developing policies that balance the recapitalization of the corridor and attendant price pressures with the desire and need to preserve affordability represents one of the central challenges of realizing residents' vision for the Columbia Pike community. As noted above, there are threshold effects in developing and preserving affordable housing. Arlington County's *Columbia Pike Neighborhoods Area Plan* concludes that high-rise and mid-rise residential developments (greater than 6 stories) are not feasible under current and generally anticipated market conditions but that this could change in the future as rents increase. The study also finds that redevelopment under current conditions was only possible when the new construction replaced the existing units by three to one for low-rise developments (less than 6 stories) – assuming below ground parking is not required. In short, the ability to preserve affordable housing is directly related to rents and permissible density. As noted in the *Neighborhoods Area Plan*, Arlington County's stock of affordable housing is eroding now even without the streetcar. Thus, some type of intervention is required if the county is to retain its affordable housing stock. If the streetcar sufficiently raises rents to permit construction at a mid-rise scale, then this creates greater opportunity for designating a portion of the stock to be maintained at an affordable rate. Depending on the magnitude of the rent increase, subsidy may not be required. Second, the increase in value offers an asset that the counties can leverage to support the affordable housing policy goal. Known as value capture, such an approach recognizes that nearby property owners will benefit from the construction of a new transit system through increased rents, sales, and land values. Some portion of these benefits is utilized to pay for the cost of the improvement or for other designated uses such as community services and affordable housing. Value capture mechanisms are varied and can be tailored to local circumstances.

Additional Public Benefits In addition to the property-related impacts, the streetcar's implementation would generate a variety of public impacts including the value of travel time savings, avoided injuries by transferring travelers to a safer mode from auto travel, a cleaner environment through reduced emissions and travel cost savings (net of transit fares) that make the cost of living in the corridor more affordable. All combined, these benefits total $252.9 million ($ 2011) and are summarized in **Table ES-2**[1].

The combined total of economic development (property premium) and the value of net new stock is $1,132.1 million assuming a 4 percent premium applied to parcels that are directly adjacent to the

[1] The public benefit analysis uses data from the AA/EA on VMT and travel minutes avoided to estimate the value of the public benefits. These are monetized according to guidance from the US Department of Transportation. In addition, an estimate of the system's residual value is developed using FTA's guidance on the typical useful life of assets. The residual value is provided as some of the components of the streetcar investment have a useful life beyond the 30-year time horizon used in this analysis. The residual analysis estimates the value of the unused portion of the asset.

corridor. This value rises to $1,321.5 if a 10 percent premium is applied to adjacent properties[2]. Combined, the two estimates provide a high and low estimate of the likely economic development response in the corridor. In addition, the project yields multiple mobility and public benefits. As noted above, these total $252.9 million ($2011)[3].

Table ES-2: Summary of Projected Mobility and Public Benefits

	Mobility and Public Benefits			
20	Value of Travel Cost Avoided by Diverting Auto Travelers to Transit (net of transit fare)	25.2	13.8	7.0
21	Value of Travel Time Saved	141.3	77.4	38.9
22	Value of Fatalities/Injuries Avoided	38.4	21.7	11.3
23	Value of Emissions Avoided (includes CO2)	15.1	8.9	6.5
24	Residual Value of System Investments Beyond the 30-year Horizon	32.8	13.3	9.5
25	**Total Mobility and Other Non-Property Benefits (20 through 24)**	**252.9**	**135.0**	**73.3**

[2] The increase in the value of existing stock combined with the addition of new stock yields greater tax revenues to the counties that would be received in the absence of the streetcar's implementation. As the tax revenues are generated by the property values, they are reported here but not summed with the property premium and construction values to avoid double counting.

[3] Because of the interaction between mobility benefits and property values—economic development occurs in response to the mobility and public benefits and thus "capitalizes" these benefits—the public benefits are not summed directly with the projected economic development estimates.