

## 6.0 Economic Development and Economic Impacts

The economic and fiscal analysis described in this Technical Memorandum was conducted as part of the Columbia Pike Transit Initiative Alternatives Analysis. As outlined in Chapter 1 of Volume I, two of the five project goals reference economic development or economic sustainability. This analysis was conducted to provide local decision makers with information needed to consider the negative and positive outcomes associated with each alternative so that they may select a single alternative to advance to construction and implementation.

To facilitate reference between the section contained in the Alternatives Analysis/Environmental Assessment (AA/EA) document and this more detailed technical memorandum, the balance of this memorandum follows the same general structure and section headings as the section in the AA/EA.

### 6.1 Introduction

The purpose of this analysis is to identify and assess the potential effect of the economic and fiscal impacts associated with construction and operation of the Columbia Pike Transit Initiative alternatives. The analysis is intended to document the following:

- Potential beneficial and adverse economic impacts associated with the construction and operation of the alternatives;
- Potential fiscal impacts associated with losses to the tax base due to property acquisitions and displacements required to construct the alternatives; and
- Economic development impacts related to livability such as the value of travel time saved and travel costs avoided, property premiums for adjacent properties, opportunities for new development investment to the counties and the corridor, and the opportunity to increase the pace of economic revitalization.

The US Department of Transportation (US DOT) has joined with the Department of Housing and Urban Development and the Environmental Protection Administration to create the Sustainable Communities Partnership. Of the six principles that guide the Partnership's programs, three have potential impact on the economic assessment of the Columbia Pike Transit Initiative alternatives. These are:

- **Provide more transportation choices:** Develop safe, reliable and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.

- **Promote equitable and affordable housing:** Expand location- and energy-efficient housing choices for people of all ages, incomes and races and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Enhance economic competitiveness:** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers as well as expanded business access to markets.

US DOT has also created a Livability Initiative under the Sustainable Communities Partnership umbrella to craft the necessary details, identify gaps in existing programs and examine new legislative concepts to further the policy objectives of the Partnership. As this federal policy is still in development, but likely to shape the evaluation of the Columbia Pike Transit Initiative in the future, the methodology and analysis in this section considers non-market factors that serve as metrics of the alternatives' impacts on livability or quality of life.

### 6.2 Methodology

This technical memorandum evaluates the following alternatives for the Columbia Pike Transit Initiative:

- No Build Alternative
- Transportation Systems Management (TSM)1 Alternative
- TSM 2 Alternative
- Streetcar Build Alternative: Skyline Central Plaza Design Option
- Streetcar Build Alternative: Skyline Route 7 Design Option
- Streetcar Build Alternative: Jefferson Street Transit Center Design Option

Where they extend beyond the study corridor, economic impacts for each alternative were identified for the Washington, DC Metropolitan Statistical Area (MSA), Arlington County, and Fairfax County. Fiscal impacts were identified for Arlington County and Fairfax County.

The following sections outline the methodological approach for documenting the economic and fiscal impacts.

#### 6.2.1 Construction-related Employment Impacts

Construction of the Columbia Pike Transit Initiative alternatives may have a substantial impact on the regional and local economy due to new direct and indirect employment that would result from the capital expenditures associated with each alternative. Direct employment consists of the construction-related employment in industries whose jobs and services are directly purchased to build the alternative. Indirect economic impacts are created by the secondary demand for goods and services across a broader spectrum of industrial sectors to support the industries providing the construction services. These indirect impacts are reflected in the economic multiplier impact for construction. The analysis estimated the number of

construction jobs and earnings generated by each alternative based on construction cost estimates.

The analysis applied a consistent set of multipliers tailored to the structure of the Washington, DC regional economy as well as Arlington County and Fairfax County. The economic impacts associated with construction expenditures were measured using regional multipliers from the Bureau of Economic Analysis (BEA) within the US Department of Commerce. Derived from the Regional Input-Output Modeling System (RIMS II), the multipliers measure the total change (direct + indirect impacts) in output, employment, and earnings that results from an incremental change to a particular industry.

### 6.2.2 Operations-related Employment Impacts

The operations and maintenance (O&M) of the Columbia Pike Transit Initiative alternatives may have a substantial impact on the regional and local economy due to new direct and indirect employment that would result from the O&M expenditures associated with each alternative. Direct employment consists of operations-related employment in industries whose jobs and services are purchased directly to operate and maintain the alternative. Indirect economic benefits are those that would be created by the secondary demand for goods and services across a broader spectrum of industrial sectors to support the industries providing the O&M services. These indirect impacts are reflected in the economic multiplier impact for transit and ground passenger transportation. The analysis estimated the number of O&M jobs and earnings generated by each alternative based on O&M cost estimates. The BEA's RIMS II multipliers measure the total change (direct + indirect impacts) in output, employment, and earnings that results from an incremental change to a particular industry.

### 6.2.3 Evaluation of Additional Tax Base Impacts (ROW)

The annual lost tax revenue associated with potential property acquisitions due to right of way (ROW) purchases, displacement, and relocation was determined by first identifying the actual properties required for each of the alternatives. The estimated assessed value of the required acquisition was then multiplied by the current (2011) real estate tax rates for Arlington County and Fairfax County.

The total value of acquisitions potentially removed from the tax base was compared to the total tax base to identify the percentage of properties that would be permanently removed and no longer generating tax revenues for each alternative considered. This comparison was used to determine whether the impacts on the tax base would be significant for the counties.

### 6.2.4 Economic Development Impacts from Mobility

An important component of the Columbia Pike Transit Initiative alternatives' operation is the impact on livability and economic development.

The analysis quantified these impacts where possible. The analysis considered the travel time savings associated with improved mobility within the study

area and travel cost savings associated with diverting riders from autos to transit. The value of the travel time savings was based on the time saved in hours for each alternative as well as the average wage for the Washington, DC MSA. The value of travel costs saved addresses both the principle of providing more transportation choices and the principle of promoting equitable and affordable housing by reducing the combined cost of housing and transportation. The number of auto vehicle miles traveled (VMT) diverted to transit was the basis for estimating the travel costs saved. Average vehicle operating costs were applied to VMT avoided to obtain the estimate of costs avoided.

The analysis also considered the impacts on development along the corridor. These impacts range from positive changes in the assessed values of the property immediately adjacent to the alternative ROW<sup>1</sup> to improving the affordability of housing and transportation for residents along the corridor. These impacts were quantified as potential gains in property values and included a qualitative discussion of the improved ability of Columbia Pike Transit Initiative corridor to capture a larger portion of the counties' commercial and residential development growth. In addition, the analysis qualitatively assesses how the Streetcar Build Alternative is consistent with Arlington and Fairfax counties' policies to improve the quality and quantity of transit service, reduce auto travel, and improve livability along the Columbia Pike Transit Initiative corridor.

## 6.3 Existing Conditions

This section documents existing economic conditions and future development plans for the Columbia Pike study area to provide context for the corridor's transportation problems and needs.

### 6.3.1 Demographics

Arlington County contains the longest segment of the Columbia Pike Transit Initiative corridor, and the 19 Census tracts located within a ¼ mile of the Pike are home to approximately 19 percent of the County's total population, based on 2010 Census figures.

The Columbia Pike corridor in Arlington County and Baileys Crossroads in Fairfax County have concentrations of elderly and immigrant populations who are frequently dependent on high-quality transit. Based on 2000 Census figures reported in the revitalization plan for the corridor, over 128 countries of

---

<sup>1</sup> As a detailed development and market analysis for the corridor is not currently available, an attempt was made to include a conservative assumption about the properties that would experience a premium due to the alternatives. Research shows that the greatest premium impacts typically occur directly adjacent to the fixed guideway ROW with diminishing gains experienced out to a ¼ mile, depending on the individual parcel characteristics and uses. Therefore, the current analysis includes only those properties directly adjacent to the ROW—those most likely to experience the premium impacts.

national origin<sup>2</sup> are represented among the Columbia Pike corridor’s residents; and, nearly 37 percent of the County’s total Hispanic population lives in the corridor, as reported in Arlington County’s 2010 Census summary for Columbia Pike.

In addition, the study area is home to several concentrations of transit-dependent populations, clustered around Jefferson Street, Pentagon City, southeast of Four Mile Run, and Baileys Crossroads. These populations show a high propensity to take transit due to zero-car households, age (under age 17 or over age 65), or income level (below the federally designated poverty line). **Table 6-1** illustrates the degree of transit dependency within the study area, and compares these percentages with total transit-dependent percentages in Arlington County and Fairfax County.

**Table 6-1: Transit-Dependent Populations in the Study Area, 2010**

	Study Area	Arlington County Total	Fairfax County Total
Zero Car Households	16%	12%	4%
Population Below Poverty Line	11%	8%	4%
Population Under 17 and Over 65	25%	24%	34%

Source: 2010 US Census

### 6.3.2 Building Stock

The residential and commercial building stock along Columbia Pike was largely built between 1961 and 1972 along the Arlington County segment of Columbia Pike; new commercial construction in the 1970s and 1980s consisted primarily of free-standing drive-through banking facilities, fast food restaurants, and convenience stores. Collectively, these building patterns have yielded older, auto-oriented suburban commercial strip developments.<sup>3</sup>

Similarly, Baileys Crossroads in Fairfax County is home to an older commercial center that is showing some signs of deterioration due to the age of the infrastructure and roadways that fragment the Baileys Crossroads region.<sup>4</sup> As a result, the area has been developed primarily as commercial strip and shopping centers. These centers are separated from each other and are structured to accommodate auto traffic rather than pedestrian access.

Arlington County and Fairfax County have each introduced a similar strategy to help foster the revitalization of the Columbia Pike corridor and Baileys Crossroads. As articulated in the *Columbia Pike Initiative: A Revitalization Plan—Update 2005*, the goal for Arlington and the partner jurisdictions is the transformation of the corridor from an “aging auto-oriented, suburban, commercial strip” into a more vibrant, pedestrian-friendly, “Main Street”

<sup>2</sup> This number has not yet been updated for the 2010 US Census.

<sup>3</sup> Arlington County. 2005. “Columbia Pike Initiative: A Revitalization Plan—Update,” pages 5-7.

<sup>4</sup> Fairfax County Comprehensive Plan, 2011 Edition for the Baileys Planning District, Amended through 07-27-2010, p.1.

<http://www.fairfaxcounty.gov/dpz/comprehensiveplan/area1/baileys.pdf>

destination. Similarly, the *Fairfax County Comprehensive Plan for the Baileys Planning District—2011 Edition* includes a vision of a “pedestrian-oriented, mixed-use development with a pedestrian scale and urban character that will complement the adjacent residential areas and promote transit usage.”<sup>5</sup> Given the already high transit usage and the density in the Columbia Pike corridor and Baileys Crossroads, the Columbia Pike Transit Initiative is intended to help foster this recapitalization of the aging corridor.<sup>6</sup>

Collectively, the zoning, premium transit availability, and the enhanced walkability and accessibility of the corridor would not only accommodate projected population and employment growth, but could also support the transformation of residents’ experience of place in the Columbia Pike corridor and Baileys Crossroads. Real estate studies are finding that more walkable environments are desirable places for development investment.<sup>7</sup> This desirability, in turn, fosters reinvestment and recapitalization of the building stock and helps change the perception of older corridors and helps encourage the creation of a destination to spend time shopping, dining out, and enjoying leisure time.

Portland, Oregon, has coined the name “20-minute neighborhood” for such areas: places with 1) a walkable environment, 2) destinations that support a range of daily needs (shop, parks, jobs), and 3) residential density. Collectively, these attributes reduce the need for car trips for a share of a typical household’s trips.<sup>8</sup> The average non-work trip length for person trips to/from the Columbia Pike corridor (within ½ mile of the proposed alignments) is just 6.2 miles. If only trips within the corridor are considered, the average trip length is only one mile. Thus, many of these very short auto-based trips would be good candidates for walking, enhanced bus, and/or streetcar modes.

### 6.3.3 Economic Development

#### Arlington County

According to Arlington County’s Community Planning and Housing Development Department (CPHD), the main purpose of the Columbia Pike Special Revitalization District is to renew the commercial areas to permit the area to be a “Main Street” shopping district. Currently, the area is auto-centric with a

<sup>5</sup> Fairfax County Comprehensive Plan, 2011 Edition for the Baileys Planning District, Amended through 07-27-2010, p.18.

<http://www.fairfaxcounty.gov/dpz/comprehensiveplan/area1/baileys.pdf>

<sup>6</sup> Robert Puentes and David Warren. February 2006. “One Fifth of America: A Comprehensive Guide to America’s First Suburbs: Data Report” Brookings Institution. Accessed at [http://www.brookings.edu/~media/Files/rc/reports/2006/02metropolitanpolicy\\_puentes/20060215\\_firstsuburbsdata.pdf](http://www.brookings.edu/~media/Files/rc/reports/2006/02metropolitanpolicy_puentes/20060215_firstsuburbsdata.pdf), page 57.

<sup>7</sup> Gary Pivo and Jeffrey Fisher. 2010. “The Walkability Premium in Commercial Real Estate investments,” forthcoming in Real Estate Economics.

<sup>8</sup> City of Portland Bureau of Planning and Sustainability, Status Report: Twenty-minute Neighborhoods, May 2009.

disproportionate number of free-standing drive-through establishments. The County lists these elements as likely to be part of the areas' remake to a pedestrian friendly one:<sup>9</sup>

- Mixed-use development districts (retail, office, residential, cultural)
- Street frontage at a pedestrian scale with articulated ground-floor retail
- Buildings oriented to Columbia Pike
- Placement of buildings at the back of sidewalks
- Buildings built close together forming a continuous "street wall" characteristic of an urban environment
- Parking located underground or to the rear of buildings
- Appropriate transitions to residential neighborhoods
- Enhanced public and pedestrian transportation
- Enhanced streetscape

Many of these goals focus on "place making," the conscientious action by developers and County officials to create a multi-purpose area that is pleasant for a multitude of reasons. The stress on a high-quality environment is in concert with the passage of a form-based code that is guiding architecture, building materials, and urban design along the Columbia Pike corridor.<sup>10</sup>

Arlington County is emphasizing commercial and social activities for Columbia Pike's renewed shopping district by describing it as "a place that is the center of the community's commercial and social life to meet friends, to see a movie or to window shop." To achieve this renewed district, the corridor must be reshaped from auto-centric to pedestrian focused. Schematics of recently approved plans indicate that businesses and residential apartments will not only be larger in scale and co-located in the same building, but also more upscale.

A comparison of data on development projects approved, under construction, or recently completed in Arlington County, as of August 2011, shows that the County is currently planning for the Columbia Pike corridor to serve as a residential and retail corridor with smaller scale sites typical of a "Main Street" shopping district. As shown in **Table 6-2** on the following page, five of the eight sites in the Columbia Pike corridor combine for 171,445 square feet of retail space. In addition to commercial space, seven of the eight sites in the Columbia Pike corridor are approved to add 1,171 residential units. This focus on housing and retail developments in Columbia Pike demonstrates Arlington's commitment to the growth and revitalization of the area.

<sup>9</sup>The Vision - Arlington's Main Street. CPHD.

<http://www.arlingtonva.us/Departments/CPHD/forums/columbia/concept/CPHDForumsColumbiaConceptTheConcept.aspx>

<sup>10</sup> "Columbia Pike Form Based Code (Section 20. Appendix A of the Zoning Ordinance). CPHD. "<http://www.arlingtonva.us/departments/CPHD/forums/columbia/current/CPHDForumsColumbiaCurrentCurrentStatus.aspx>

## Fairfax County

Baileys Crossroads in Fairfax County is home to the western terminus of the alternatives. It is an older commercial center that is showing some signs of deterioration due to the age of the infrastructure and roadways that fragment the Baileys Crossroads region. As a result, the area has been developed primarily as commercial strips and shopping centers. These centers are separated from each other and are structured to accommodate auto traffic rather than pedestrian access.

Fairfax County recognizes the importance of the commercial activity at the heart of the Baileys Crossroads Community Business Center (CBC) and is committed to restoring its viability through commercial revitalization as described in the *Fairfax County Comprehensive Plan for the Baileys Planning District*. The Plan focuses on the retention, redevelopment, and revitalization of the existing community-serving retail uses. However, the vision for future development also includes a "pedestrian-oriented, mixed-use development with a pedestrian scale and urban character that will complement the adjacent residential areas and promote transit usage."<sup>11</sup> The County includes the following objectives for the Baileys Planning District:<sup>12</sup>

- Improve the appearance and function of the Business Center through coordination of land uses, unified signage, consolidation of curb cuts, landscaping treatment, and provision of pedestrian-oriented amenities
- Encourage pedestrian access to and from retail areas
- Establish a clearly defined 'edge' between commercial and residential areas
- Encourage the creation of additional parks, open space, and recreation areas

Like Columbia Pike, many of these objectives are designed to encourage "place making." The County would like Baileys Crossroads to become an attractive, diverse, and vibrant area for living, working, shopping, and relaxing. To make this happen, the County is encouraging the development and revitalization of the area to be compact and pedestrian/bicycle-friendly. Additionally, multi-modal usage will be promoted by providing convenient access for transit, bus, and bicycle users throughout the region. The plan calls for the densest development to be focused near transit stops to promote transit usage and create vibrant mixed-use destinations. The public space will also be enhanced to create a sense of place through a network of streets and open spaces that allow opportunities for walking, playing games, and enjoying the outdoors; recreational and civic uses; and inviting places to eat, shop, stroll, and spend time.

<sup>11</sup> Fairfax County Comprehensive Plan, 2011 Edition for the Baileys Planning District, Amended through 07-27-2010, p.18.

<http://www.fairfaxcounty.gov/dpz/comprehensiveplan/area1/baileys.pdf>

<sup>12</sup> Ibid. Please note that the list is not inclusive of all the objectives listed in the Comprehensive Plan.

**Table 6-2: Total Residential Units, Hotel Rooms and Square Footage by Land Use per Area by Project Status**

Area	Status	County	Residential		Office		Retail		Other		Hotel	
		Number of Developments	Sites with Res. Units	Residential Units	Sites with Office (sf)	Office (sf)	Sites with Retail (sf)	Retail (sf)	Sites with Other (sf)	Other (sf)	Sites with Hotel Rooms	Hotel Rooms
Columbia Pike	Approved	4	3	180	0	0	2	5,210	2	445,518	0	0
Columbia Pike	Under Construction	0	0	0	0	0	0	0	0	0	0	0
Columbia Pike	Complete	4	4	991	1	14,650	3	166,235	1	7,500	0	0

Source: Arlington County CPHD as of August 2011

### 6.3.4 Un-Built Development Capacity

Given its location, transportation access, and community focus, Arlington County has experienced significant commercial and residential development and redevelopment over the last several decades. This development has been focused largely along WMATA’s Metrorail Corridors in the County: Rosslyn-Ballston (Orange Line) and Jefferson Davis (Yellow and Blue Lines). As of 2007, almost 80 percent of the office space and 90 percent of hotel rooms in the County were located along these Metrorail corridors.<sup>13</sup> Table 6-3 summarizes the 2007 development and development capacity remaining in the County and the Metrorail Corridors.

As Arlington County does not have many large undeveloped greenfield sites, most new development would have to take advantage of parcels that could be put to a higher valued use.<sup>14</sup> As a result, Arlington has planned for ‘second generation’ redevelopment in downtown corridors such as Crystal City, Rosslyn, and Clarendon. In addition, mixed use development projects are also being established for Pentagon City, Potomac Yard, Courthouse, and Ballston. The Columbia Pike corridor and Baileys Crossroads are also in position to accommodate growth due to their location, transportation improvements, and community character.

In September 2010, an analysis of the development capacity for the Columbia Pike area was developed by the Planning Research and Analysis Team (PRAT) of the Arlington County Planning Division. This analysis is summarized in Table 6-4. Please note that the analysis year is different than the Arlington County and Metrorail Corridors shown in Table 6-3. As a result, a direct comparison of development square footage remaining is not possible due to potential changes in the build-out square footage; however, the percentage build-out numbers provide an appropriate context for the potential to accommodate additional development. By development type, Columbia Pike

contains about 16 percent of the un-built office development capacity, about 15 percent of the un-built retail development capacity, 16 percent of the un-built residential development capacity, and 15 percent of the un-built hotel development capacity in Arlington County.

The predominant uses along the central spine of Columbia Pike are neighborhood or local commercial and multi-family residential. Smaller mixed-use centers are emerging along the corridor and, due to changing land use regulations, opportunities for redevelopment and densification are available. The single-story commercial strip centers and large surface parking lots that line Columbia Pike and Jefferson Street are already beginning to fill in with multi-story mixed-use buildings fronting on streets with wide sidewalks with pedestrian and bicycle supportive amenities.

Similarly, the Fairfax County Comprehensive Plan analyzes the development capacity for the Baileys Crossroads CBC. A summary of the development capacity for the portion of the Baileys Crossroads CBC located within the Columbia Pike Transit Initiative study area is summarized in Table 6-5. As shown in the table, Baileys Crossroads has the development capacity available through redevelopment and revitalization to accommodate new office, retail, and residential development attracted to the region due to its location, transportation improvements, and community character.

The current mixed-used development focus, the Columbia Pike Initiative’s revitalization plan, the Fairfax County Comprehensive Plan, existing high transit usage, and opportunities for redevelopment along the corridor make it a prime location to accommodate future development growth in Arlington and Fairfax counties. The Columbia Pike corridor and Baileys Crossroads offer significant opportunities for office, retail, residential, and hotel expansion; however, given the demand in the Washington, DC metropolitan area for housing and commercial development that is accessible by a range of high-quality transportation options, it will be difficult to reach the full development potential without additional investment in capacity expanding projects, particularly transit and additional bicycle/pedestrian enhancements.

<sup>13</sup> Planning Research and Analysis Team (PRAT) of the Arlington County Planning Division, Department of Community Planning, Housing, and Development, *Development Capacity in Arlington’s Metro Corridors*, December 2007, p.2. This data has not been updated since the 2007 report.

<sup>14</sup> Ibid., p.1.

**Table 6-3: Remaining Development Potential in Arlington County (2007)**

	Arlington County				Rosslyn-Ballston Metrorail Corridor				Jefferson Davis Metrorail Corridor			
	Existing or Under Construction	Build Out	Development Remaining	% Build Out	Existing or Under Construction	Build Out	Development Remaining	% Build Out	Existing or Under Construction	Build Out	Development Remaining	% Build Out
Office (sf)	44,015,012	55,455,100	11,440,088	79%	22,632,402	30,052,000	7,419,598	75%	12,631,955	13,923,500	1,291,545	91%
Retail (sf)	9,580,603	11,467,600	1,886,997	84%	2,995,529	3,495,900	500,371	86%	2,740,565	2,799,200	58,635	98%
Residential Units	99,701	124,200	24,499	80%	27,756	37,100	9,344	75%	10,434	17,265	6,831	60%
Hotel Rooms	9,984	11,100	1,116	90%	3,741	3,934	193	95%	5,298	5,944	646	89%

Source: Planning Research and Analysis Team (PRAT) of the Arlington County Planning Division, Development Capacity in Arlington's Metro Corridors, December 2007

**Table 6-4: Remaining Development Potential along Columbia Pike (2010)**

	Existing or Under Construction	Build Out	Development Remaining	% Build Out
Office (sf)	2,029,326	3,860,623	1,831,297	53%
Retail (sf)	742,485	1,016,107	273,622	73%
Residential Units	17,120	20,988	3,868	82%
Hotel Rooms	491	658	167	75%

Source: Planning Research and Analysis Team (PRAT) of the Arlington County Planning Division, September 2010

**Table 6-5: Remaining Development Potential in Baileys Crossroads (2011)**

	Existing or Under Construction	Build Out	Development Remaining	% Build Out
Office (sf)	3,484,379	5,108,000	1,623,621	68%
Retail (sf)	1,375,473	1,547,000	171,527	89%
Industrial (sf)	292,693	0	na	na
Institutional (sf)	28,865	102,000	73,135	28%
Residential Units	4,569	8,660	4,091	53%

Note: This is not the full development potential for all of the Baileys Crossroads Community Business Center, which is broken out into three districts: Baileys East, Town Center, and Baileys West. The table above includes development potential associated with Baileys East and most of Town Center (except land-units B-1 and B-2)

Source: Fairfax County, based on the Comprehensive Plan for the Baileys Planning District, 2011 Edition

### 6.3.5 Housing and Transportation Affordability

Table 6-6 summarizes housing and transportation costs for the block groups that are adjacent to the Columbia Pike Transit Initiative alternatives. The data are taken from the Center for Neighborhood Technology's (CNT) Housing + Transportation (H+T) Index, a measure of the combined neighborhood housing and transportation costs divided by average neighborhood income as a measure of the cost burden. The values in the table below represent the Regional Moderate Household series, which are used to represent a working family in the selected area. Income is based on 80 percent of the area median income (AMI) where average household size and average working commuters per household remain constant for the regional average. This household type allows the user to view areas that are affordable to the typical working family, who might have a more constrained household budget. CNT has defined an affordable range for H+T as the combined costs consuming no more than 45 percent of income.

Of note, the table illustrates that only two Census block groups within the study corridor currently exceed the 45 percent affordability threshold—both of which are near Bailey's Crossroads. However, while most of the block groups and the Washington, DC MSA are currently below the 45 percent threshold, these areas will continue to approach and likely exceed this threshold in the near future as the region continues to grow and congestion levels increase. Without measures to improve the transportation options and mobility, particularly in inner-ring suburbs, the combined housing and transportation costs are expected to increase throughout the study corridor and region. This trend will make it more difficult for low-to-moderate income and transit dependent households to remain and thrive in the study corridor.

**Table 6-6: Relative Housing and Transportation Costs in the Study Area**

Block groups	Housing Cost as Share of Income (%)	Housing + Transp. Cost as Share of Income (%)	Area Housing + Transp. Cost Relative to MSA Average	Transp. Cost as Share of Income (%)	Area Transp. Cost Relative to MSA Average
510131022001	17.1	31.9	0.73	14.8	0.84
510131023002	29.9	44.8	1.03	14.9	0.85
510131023003	23.1	38.4	0.88	15.3	0.87
510131023004	31.2	47.6	1.09	16.4	0.93
510131027001	15.3	29.7	0.68	14.4	0.82
510131028001	19.0	33.6	0.77	14.6	0.83
510131028004	16.6	31.0	0.71	14.4	0.82
510594515004	27.0	43.0	0.99	16.0	0.91
510594528002	23.1	37.8	0.87	14.7	0.84
510594528003	20.6	35.1	0.81	14.5	0.82
515102001011	15.9	32.1	0.74	16.2	0.92
515102001015	29.8	46.4	1.06	16.6	0.94
510594528004	20.3	35.1	0.81	14.8	0.84
510131022002	16.5	30.9	0.71	14.4	0.82
510131025001	22.2	35.7	0.82	13.5	0.77
510131025002	18.3	32.6	0.75	14.3	0.81
510131025003	25.7	41.0	0.94	15.3	0.87
510131026001	20.6	35.4	0.81	14.8	0.84
510131032004	18.5	34.4	0.79	15.9	0.90
510131033001	20.4	35.1	0.81	14.7	0.84
510131034011	13.6	30.8	0.71	17.2	0.98
510131034021	29.9	42.6	0.98	12.7	0.72
510131035002	21.0	34.1	0.78	13.1	0.74
510131034023	27.3	40.6	0.93	13.3	0.76
Washington, DC MSA	26.0	43.6	1.00	17.6	1.00

Source: Center for Neighborhood Technologies' (CNT) Housing + Transportation (H+T) Index, 2011<sup>15</sup>

## 6.4 Environmental Consequences

The following sections outline the impacts associated with the construction, operation, and market response to the Columbia Pike Transit Initiative alternatives.

### 6.4.1 Construction-related Employment Impacts

#### Expenditures

The gross capital expenditures for the TSM and Streetcar Build Alternatives are shown in **Table 6-7** and are relative to the No Build Alternative. The total capital expenditures are divided into four major categories. These include:

- General Construction: guideway elements, stations, yards and shops, sitework, systems, and contingencies;
- Vehicles: vehicle manufacturing and assembly
- Right-of-Way (ROW): all rights-of-way, land and existing improvements; and
- Soft Costs: professional engineering and related services.

The economic impact of these expenditures would vary significantly by activity and depends on the amount of locally produced goods and services embodied in the purchase. Construction goods and services would be purchased in the local economy. Although every building material required for the alternatives would not be produced locally, the RIMS II multipliers reflect the supplier linkages for the industry, and thus account for this leakage from the local economy.

Vehicles, by contrast, would not be purchased from the local economy. The Washington, DC regional economy does not produce transit vehicles, limiting the potential local impact this purchase could have. Thus, as no local labor would be used to produce the vehicles, no local impacts generated by their purchase would be realized. Although there likely would be some assembly required upon delivery of the vehicles and it would be possible that a component of the vehicle might be made by a local supplier, these possibilities represent a negligible share of the vehicles' cost and are excluded from this analysis.

<sup>15</sup> <http://htaindex.cnt.org/>

**Table 6-7: Capital Expenditures for Columbia Pike Transit Initiative Alternatives (thousands of 2011\$)**

Expenditure	TSM Alternatives		Build Alternative		
	1	2	Skyline Central Plaza Design Option	Skyline Route 7 Design Option	Jefferson Street Transit Center Design Option
Construction	\$ -	\$19,034	\$110,563	\$103,553	\$98,909
ROW, Land, Existing Improvements	\$ -	\$3,959	\$12,101	\$12,417	\$12,133
Vehicles	\$3,718	\$18,322	\$51,597	\$51,597	\$51,597
Professional Services	\$ -	\$2,082	\$33,930	\$31,821	\$30,410
Unallocated Contingency (Construction)	\$507	\$3,522	\$22,543	\$21,626	\$21,003
<b>Total</b>	<b>\$4,225</b>	<b>\$46,918</b>	<b>\$230,735</b>	<b>\$221,014</b>	<b>\$214,052</b>

Note: The expenditures are assumed to be 85% in Arlington County and 15% in Fairfax County  
Source: AECOM

Right-of-way expenditures shown above are for real property only; the transaction costs associated with these expenditures are included in the Soft Cost category. As there is no labor associated with the ROW expenditures, there is no economic impact to the pure land costs.

Professional services are purchased in the local economy and have an impact in the local economy.

In sum, there are two types of capital expenditures that are expected to impact the economy: general construction and soft costs. The total expenditures (in 2011 dollars) on these two categories are \$167.0 million for Skyline Central Plaza Design Option, \$157.0 million for Skyline Route 7 Design Option, \$150.3 million for the Jefferson Street Transit Center Design Option, \$0.5 million for TSM 1 Alternative, and \$24.6 million for TSM 2 Alternative.

### Funding Sources

In order to isolate the potential economic effects of the alternatives on the local economy, it is necessary to distinguish those resources that are new to the economy and that would not be invested in Arlington County and Fairfax County but for the alternative, from those that would still be spent in the region with similar economic effects (for example, funds that would be allocated to other transportation construction projects in the region).

The alternatives are being developed in a manner that is consistent with FTA Small Starts/New Starts guidance in order to use federal funding for the capital expenses. If FTA funding were to be used, the Small Starts/New Starts funds (as assumed in the financial plan) would be new to the region and represent a net gain. In addition, the financial plan assumes that the federal funds would be matched with local and state funds. The state funds would be new to the region and represent a net gain for Arlington and Fairfax as there is no guarantee that the counties would receive these funds for other transportation projects. However, the local funds would be collected via property taxes for the purposes of making transportation investments in the counties. Thus, they originate within the counties and will be spent on a transportation project in the counties—if not the Columbia Pike Transit

Initiative, then another project with similar job impacts. As a result, the impacts shown below are distinguished between new gains to the region (as a result of the federal and state funding) and sustained/supported jobs (as a result of the local funding).

If FTA Small Starts/New Starts funds are not available, it is assumed that the selected alternative would be funded with local funds, which are collected via tax revenues for the purpose of making transportation investments in the counties. Thus, they originate within the counties and will be spent on a transportation project in the counties of some type—if not the Columbia Pike Transit Initiative, then another project with similar job impacts. As a consequence, the impacts would not be net gains to the region but rather jobs supported by the Columbia Pike Transit Initiative.

### Impacts

RIMS II multipliers are used to translate capital expenditures for the Columbia Pike Transit Initiative alternatives shown in Table 6-7 into the associated job and income effects. The impacts are shown for the entire Washington, DC MSA, Arlington County, and Fairfax County. The impacts vary by the geographic area considered; impacts are greater for the metro area relative to the counties as there is less “leakage” associated with construction spending. Put another way, a larger economy captures a greater share of project spending as its greater size allows it to provide a greater share of the diverse range of services required for construction.

Applying the Final Demand Multipliers for the construction and professional services industries<sup>16, 17</sup> to the amount of capital expenditures in each industry

<sup>16</sup> The RIMS II Final Demand Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the construction and professional services industries. The Construction Final Demand Earnings Multipliers are 0.0785 for Arlington County, 0.2844 for Fairfax County, and 0.6764 for the Washington, DC MSA; the Professional, Scientific, and Technical Services Final Demand Earnings Multipliers are 0.1062 for Arlington County, 0.3843 for Fairfax County, and 0.7839 for the Washington, DC MSA.

provides estimates of the earnings and employment impacts generated by each alternative. The results are summarized in **Tables 6-8, 6-9, and 6-10**. The tables show the impacts for three different geographies: Washington, DC MSA, Arlington County, and Fairfax County. Note that the impacts shown in **Tables 6-9 and 6-10** are not additive to **Table 6-8**; as the county impacts are included in the Washington, DC MSA impacts. In addition, these are one-time impacts that last for the duration of the construction period. One job is defined as a job for one person of one year's duration. As an example, a job for one person that had a duration of three years would be defined as three person-year jobs.

### No Build Alternative

The capital expenditures developed for the TSM and Streetcar Build Alternatives are relative to the No Build Alternative. Therefore, no construction jobs or earnings are estimated for the No Build Alternative.

### TSM 1 Alternative

The TSM 1 Alternative would have limited capital expenditures, mostly for vehicles; therefore, the job and earnings impacts would be small. During the construction period, eight person-year jobs and \$343,000 in earnings would be supported in the Washington, DC MSA by this alternative. Depending on the funding sources used, these impacts would be new jobs and earnings, supported jobs and earnings, or some combination of both. For the TSM 1 Alternative funding scenario that would apply 100 percent local money, the impacts shown in the table would represent 100 percent supported (local funding) jobs and earnings.

### TSM 2 Alternative

The construction expenditures for the TSM 2 Alternative would fall in between TSM 1 and the Streetcar Build Alternatives. As a result, the construction impacts would be greater than the TSM 1 Alternative, but less than the Streetcar Build Alternative. During the construction period, 380 person-year jobs and \$16.9 million in earnings would be supported in the Washington, DC MSA by this alternative. Depending on the funding sources used, these impacts would be new jobs and earnings, supported jobs and earnings, or some combination of both. For the TSM 2 Alternative funding scenario that would apply 33 percent state and 67 percent local money, the impacts shown in the table would represent 33 percent new (state funding) and 67 percent supported (local funding) jobs and earnings.

### Streetcar Build Alternative

The Streetcar Build Alternative would have the largest capital expenditures associated with it; therefore, it would support the largest number of temporary jobs and earnings. During the construction period, between 2,314 and 2,517 person-year jobs and between \$104.9 million and \$116.6 million in earnings would be supported by this alternative in the Washington, DC MSA (depending on the design option). **Tables 6-8, 6-9, and 6-10** include the impacts for each design option. Depending on the funding sources used, these impacts would be new jobs and earnings, supported jobs and earnings, or some combination of both. For the Streetcar Build Alternative funding scenario that would apply 30 percent federal money, 14 percent state, and 56 percent local, the impacts shown in the table would represent 44 percent new (federal and state funding) and 56 percent supported (local funding) jobs and earnings.

## 6.4.2 Operations-related Employment Impacts

### Expenditures

The operating expenditures include the costs of both bus and streetcar service for the following alternatives:

- No Build
- TSM 1
- TSM 2
- Streetcar Build (assumes the Skyline Route 7 Design Option)

**Table 6-11** summarizes the operations and maintenance costs for each of the alternatives. The Streetcar Build Alternative O&M costs are assumed to be the same for all three design options.

<sup>17</sup> The RIMS II Final Demand Employment Multiplier represents the total change in number of jobs that occurs in all industries for each \$1 million of output delivered to final demand by the construction and professional services industries. The Construction Final Demand Employment Multipliers are 2.0193 for Arlington County, 7.5844 for Fairfax County, and 15.7995 for the Washington, DC MSA; the Professional, Scientific, and Technical Services Final Demand Employment Multipliers are 1.9035 for Arlington County, 7.4199 for Fairfax County, and 15.4098 for the Washington, DC MSA.

**Table 6-8: Construction Impacts for the Washington, DC MSA**

Impacts	TSM Alternatives		Streetcar Build Alternative		
	1	2	Skyline Central Plaza Design Option	Skyline Route 7 Design Option	Jefferson Street Transit Center Design Option
Employment	8	380	2,571	2,417	2,314
Earnings (in 000s of 2011\$)	\$343	\$16,889	\$116,631	\$109,616	\$104,947

Note: The impacts shown in this table reflect all construction expenditures, as all expenses occur within the Washington, DC MSA.  
Source: AECOM calculation using RIMS II Multipliers

**Table 6-9: Construction Impacts for Arlington County**

Impacts	TSM Alternatives		Streetcar Build Alternative		
	1	2	Skyline Central Plaza Design Option	Skyline Route 7 Design Option	Jefferson Street Transit Center Design Option
Employment	1	41	277	261	250
Earnings (in 000s of 2011\$)	\$34	\$1,693	\$11,944	\$11,225	\$10,746

Source: AECOM calculation using RIMS II Multipliers, based on expenditures in Arlington County (assumes 85% of the expenses occur in Arlington County)

**Table 6-10: Construction Impacts for Fairfax County**

Impacts	TSM Alternatives		Streetcar Build Alternative		
	1	2	Skyline Central Plaza Design Option	Skyline Route 7 Design Option	Jefferson Street Transit Center Design Option
Employment	1	27	185	174	167
Earnings (in 000s of 2011\$)	\$22	\$1,082	\$7,634	\$7,174	\$6,868

Source: AECOM calculation using RIMS II Multipliers, based on expenditures in Fairfax County (assumes 15% of the expenses occur in Fairfax County)

**Table 6-11: O&M Expenditures for Columbia Pike Transit Initiative Alternatives (in millions of 2011\$)**

Alternatives	2011\$
No Build	\$ 14.45
TSM 1	\$ 20.08
TSM 2	\$ 19.44
Streetcar Build	\$ 22.06

Note: The O&M expenditures are assumed to occur 85% in Arlington County and 15% in Fairfax County based on the financial plan's assumptions on how the counties will fund the local share of expenditures.

Source: AECOM

### Funding Sources

As with the capital expenditures, the operating plan would rely on a mix of sources, including fares and local and state subsidies. In addition, after seven years, the Streetcar Build Alternative would be eligible for federal 5309 fixed guideway funds for use as preventative maintenance. As a result, the jobs and earnings associated with the operations and maintenance activities for the alternatives would only represent net new regional gains for the funding provided by the state and eventually by FTA. Those purchases supported with local funding would not be net new gains for the economy, but rather jobs and

income supported by the project alternative selected. Table 6-12 documents the O&M financial plan assumptions for the Columbia Pike Transit Initiative alternatives for 2030.

**Table 6-12: O&M Funding Sources for Columbia Pike Transit Initiative Alternatives (percent of total)**

2030 Alternative	Funding Source %			
	Fares	Federal	State	Local
No Build	30%	0%	15%	55%
TSM 1	28%	0%	15%	57%
TSM 2	35%	0%	15%	50%
Streetcar Build	33%	4%	15%	48%

Source: Columbia Pike Transit Initiative Financial Plan

As a result, the impacts shown below are distinguished between new gains to the region (as a result of the federal and state funding) and sustained/supported jobs (as a result of the local funding).

### Impacts

RIMS II multipliers are used to translate the O&M expenditures for the Columbia Pike Transit Initiative alternatives shown in Table 6-11 into the

associated job and earnings effects. The impacts are shown for the entire Washington, DC MSA, Arlington County, and Fairfax County. The impacts vary by the geographic area considered; impacts are greater for the metro area relative to the counties as there is less “leakage” associated with spending. In other words, a larger economy captures a greater share of the O&M spending as its greater size allows it to provide a greater share of the diverse range of services required for operation and maintenance

Applying the Final Demand Multipliers for the transit industry<sup>18, 19</sup> to the annual O&M expenditures provides estimates of the earnings and employment impacts generated by the operation of the Columbia Pike Transit Initiative alternatives. The results are summarized in **Tables 6-13, 6-14, and 6-15**. These impacts are long-term annual impacts that continue for the life of the service. Note that the impacts shown in **Tables 6-14 and 6-15** are not additive to **Table 6-13**; as the county impacts are included in the Washington, DC MSA impacts.

**Table 6-13: Annual O&M Impacts for the Washington, DC MSA**

Impacts	No Build	TSM 1	TSM 2	Streetcar Build
Employment	316	439	425	482
Earnings (in 000s of 2011\$)	\$10,098	\$14,035	\$13,585	\$15,414

Source: AECOM calculation using RIMS II Multipliers

**Table 6-14: Annual O&M Impacts for Arlington County**

Impacts	No Build	TSM 1	TSM 2	Streetcar Build
Employment	42	59	57	65
Earnings (in 000s of 2011\$)	\$921	\$1,280	\$1,239	\$1,406

Source: AECOM calculation using RIMS II Multipliers

**Table 6-15: Annual O&M Impacts for Fairfax County**

Impacts	No Build	TSM 1	TSM 2	Streetcar Build
Employment	25	35	34	39
Earnings (in 000s of 2011\$)	\$550	\$764	\$739	\$839

<sup>18</sup> The RIMS II Final Demand Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the transit industry. The Transit and Ground Passenger Transportation Final Demand Earnings Multipliers are 0.0750 for Arlington County, 0.2536 for Fairfax County, and 0.6989 for the Washington, DC MSA.

<sup>19</sup> The RIMS II Final Demand Employment Multiplier represents the total change in number of jobs that occurs in all industries for each \$1 million of output delivered to final demand by the transit industry. The Transit and Ground Passenger Transportation Final Demand Employment Multipliers are 3.6583 for Arlington County, 12.4029 for Fairfax County, and 23.1445 for the Washington, DC MSA.

Source: AECOM calculation using RIMS II Multipliers

### No Build Alternative

The No Build Alternative would involve the smallest annual O&M expenditures; therefore, the jobs and earnings would be the smallest of all the alternatives evaluated. The annual recurring impacts in the Washington, DC MSA would be 316 person-year jobs and \$10.1 million in earnings for this alternative.

Depending on the funding sources used, these impacts would be new jobs and earnings, supported jobs and earnings, or some combination of both. In the Financial Plan, it is assumed that for the No Build Alternative, the only new funding would come from the state; therefore, 15 percent of the No Build’s impacts would represent new jobs and earnings and the remainder would be supported jobs and earnings.

### TSM 1 Alternative

The TSM 1 Alternative annual O&M expenditures would fall in between the TSM 2 Alternative and the Streetcar Build Alternative. As a result, the O&M job and earnings impacts would be greater than the TSM 2 Alternative, but less than the Streetcar Build Alternative. The annual recurring impacts in the Washington, DC MSA would be 439 person-year jobs and \$14.0 million in earnings for this alternative.

Depending on the funding sources used, these impacts would be new jobs and earnings, supported jobs and earnings, or some combination of both. In the Financial Plan, it is assumed that for the TSM Alternatives, the only new funding would come from the state; therefore, 15 percent of the TSM 1 Alternative’s impacts would represent new jobs and earnings and the remainder would be supported jobs and earnings.

### TSM 2 Alternative

The O&M expenditures for the TSM 2 Alternative would be less than the TSM 1 Alternative; therefore, the job and earnings would be slightly smaller than TSM 1. The annual recurring impacts in the Washington, DC MSA would be 425 person-year jobs and \$13.6 million in earnings for this alternative.

Depending on the funding sources used, these impacts would be new jobs and earnings, supported jobs and earnings, or some combination of both. In the Financial Plan, it is assumed that for the TSM Alternatives, the only new funding would come from the state; therefore, 15 percent of the TSM 2 Alternative’s impacts would represent new jobs and earnings and the remainder would be supported jobs and earnings.

### Streetcar Build Alternative

The Streetcar Build Alternative would be the most expensive to operate and maintain; therefore, the recurring O&M job and earnings impacts would be the greatest for this alternative. The annual recurring impacts in the Washington, DC MSA would be 482 person-year jobs and \$15.4 million in earnings.

Depending on the funding sources used, these impacts would be new jobs and earnings, supported jobs and earnings, or some combination of both. For the Streetcar Build Alternative during the first seven years (when no federal money is being applied to operating), the impacts would be 15 percent new and 85 percent supported. After seven years, the Streetcar Build Alternative would be eligible for Federal Fixed Guideway Modernization funds; therefore, by 2030, 19 percent of the impacts would represent new jobs and earnings (federal and state revenues) and 81 percent would be supported jobs and earnings (fares and local revenues).

### 6.4.3 Tax Base Impacts

Construction of the No Build, TSM 2, and Streetcar Build Alternatives would require the purchase of some private land and/or structures for easements, ROW, and station facilities. This purchase would remove these properties from the existing local tax base. However, none of the tax base losses would be significant given the size of each county's tax base. **Table 6-16** summarizes the tax base impacts by county for each alternative.

#### No Build Alternative

The construction of the No Build Alternative would result in 71 partial land acquisitions, which would remove property from the tax base and thereby reduce the tax revenue generated in the one jurisdiction where the acquisitions would occur—Arlington County. The total value of acquisitions would be \$1.8 million (2011 dollars). **Table 6-17** details the acquisitions and the tax revenue that would be lost.

While this would be an adverse impact, it is insignificant, as the total value of the acquisitions is 0.003 percent of the total property tax base in Arlington County.

#### TSM 1 Alternative

The construction of the TSM 1 Alternative would not result in any land acquisitions. As a result, there would be no tax base impacts for this alternative.

#### TSM 2 Alternative

The construction of the TSM 2 Alternative would result in 11 partial land acquisitions, which would remove property from the tax base and thereby reduce the tax revenue generated in the two jurisdictions where the acquisitions would occur—Arlington County and Fairfax County. The total value of acquisitions would be \$1.7 million (2011 dollars). Of this \$0.1 million would take place in Arlington and the remaining \$1.6 million would occur in Fairfax. **Table 6-18** details the acquisitions and the tax revenue that would be lost.

While this would be an adverse impact, it is insignificant, as the total value of the acquisitions is 0.000 percent of the total property tax base in Arlington and 0.001 percent in Fairfax.

**Table 6-16: Total Assessed Value of Property Land Acquisitions for Columbia Pike Transit Initiative Alternatives**

County	Total Assessed Value of All Property in the County (in 000s)	No Build (in 000s)	TSM 1 Alternative (in 000s)	TSM 2 (in 000s)	Jefferson Street Transit Center Design Option (in 000s)	Skyline Central Plaza Design Option (in 000s)	Skyline Route 7 Design Option (in 000s)	Potential Site for Staging and Const.
Arlington County	\$57,399,066	\$1,812	\$0	\$133	\$3,150	\$3,150	\$3,150	\$1,746
Fairfax County	\$193,900,000	\$ -	\$ -	\$1,588	\$1,585	\$2,418	\$1,694	\$ -

Sources: AECOM and Arlington County and Fairfax County Property Tax Assessment Maps<sup>20</sup>

<sup>20</sup> <http://www.arlingtonva.us/departments/realestate/reassessments/scripts/dreadefault.asp> and <http://icare.fairfaxcounty.gov/Search/GenericSearch.aspx?mode=ADDRESS>

Table 6-17: Property Impacts Associated with Land Acquisitions for the No Build Alternative

Guideway/Facility Type	Location	Jurisdiction	Parcel Number	Land Value	Total Parcel Area (sf)	Area of ROW Impact (sf)	Assessed Value of ROW Impact Area	Tax Rate per \$100 of Assessed Value	Property Tax Revenues Lost With Taking
Sidewalk	btw Jefferson and Greenbrier	Arlington	22011052	\$14,964,000	368,685	99	\$ 4,029	0.958	\$ 39
Sidewalk	Side Road Dinwiddie	Arlington	22014001	\$6,440,200	151,929	186	\$ 7,891	1.083	\$ 85
Sidewalk	near Frederick	Arlington	22014002	\$1,407,800	42,322	369	\$ 12,282	0.958	\$ 118
Sidewalk	Side Road George Mason	Arlington	23033001	\$842,700	15,517	31	\$ 1,690	1.083	\$ 18
Sidewalk	near Randolph	Arlington	23033075	\$1,438,000	34,143	45	\$ 1,906	1.083	\$ 21
Sidewalk	btw Buchanan and Wakefield	Arlington	23037004	\$171,200	3,151	22	\$ 1,203	1.083	\$ 13
Sidewalk	btw Buchanan and Wakefield	Arlington	23037005	\$689,300	12,851	125	\$ 6,695	1.083	\$ 73
Sidewalk	btw Buchanan and Wakefield	Arlington	23037006	\$661,800	12,071	193	\$ 10,608	1.083	\$ 115
Sidewalk	btw Buchanan and Wakefield	Arlington	23037007	\$661,800	11,816	116	\$ 6,516	1.083	\$ 71
Sidewalk	btw Buchanan and Wakefield	Arlington	23037008	\$668,400	12,427	190	\$ 10,246	1.083	\$ 111
Sidewalk	btw Buchanan and Wakefield	Arlington	23037009	\$765,400	13,822	928	\$ 51,369	1.083	\$ 556
Sidewalk	Side Road Taylor	Arlington	23038019	\$11,990,000	262,720	31	\$ 1,406	0.958	\$ 13
Sidewalk	Near Monroe	Arlington	23039029	\$598,400	11,330	27	\$ 1,448	1.083	\$ 16
Sidewalk	btw Monroe and Oakland	Arlington	23039042	\$1,459,200	26,189	932	\$ 51,904	1.083	\$ 562
Sidewalk	Near Lincoln	Arlington	23040009	\$2,889,400	57,368	345	\$ 17,389	0.000	\$ -
Sidewalk	Side Road Glebe	Arlington	25012001	\$4,223,700	79,714	26	\$ 1,357	1.083	\$ 15
Sidewalk	Side Road Highland	Arlington	25014003	\$2,110,500	41,221	20	\$ 1,019	1.083	\$ 11
Sidewalk	near Scott	Arlington	25020008	\$473,200	10,816	38	\$ 1,669	0.000	\$ -
Sidewalk	Side Road Glebe	Arlington	26001020	\$2,554,000	39,522	37	\$ 2,361	1.083	\$ 26
Sidewalk	Near Quincy	Arlington	26002003	\$4,091,500	98,861	190	\$ 7,853	0.958	\$ 75
Sidewalk	Near Oakland	Arlington	26002004	\$3,408,500	81,795	818	\$ 34,078	0.958	\$ 326
Sidewalk	Near Oakland	Arlington	26002012	\$4,091,500	98,400	210	\$ 8,738	0.958	\$ 84
Sidewalk	Near Quincy	Arlington	26002013	\$7,931,800	191,504	1,051	\$ 43,519	0.958	\$ 417
Sidewalk	Across Taylor	Arlington	27002002	\$901,100	28,096	894	\$ 28,675	0.958	\$ 275
Sidewalk	Near Scott	Arlington	32001002	\$10,371,600	164,695	3,349	\$ 210,915	0.958	\$ 2,021
Sidewalk	btw Couthouse and Scott	Arlington	32001004	\$4,800,300	93,206	797	\$ 41,064	0.958	\$ 393
Sidewalk	Near Scott	Arlington	32001042	\$4,499,300	80,355	2,241	\$ 125,503	0.958	\$ 1,202
Sidewalk	Near Courthouse	Arlington	32001044	\$4,793,500	95,658	568	\$ 28,445	0.958	\$ 273
Sidewalk	Near Courthouse	Arlington	32001045	\$4,800,200	93,902	687	\$ 35,141	0.958	\$ 337
Sidewalk	Near Glebe	Arlington	32007012	\$2,440,100	42,244	56	\$ 3,238	1.083	\$ 35
Sidewalk	btw Glebe and Highland	Arlington	32007014	\$8,106,800	143,575	283	\$ 15,986	1.083	\$ 173
Sidewalk	Near Highland St	Arlington	32007018	\$2,376,900	42,903	313	\$ 17,323	1.083	\$ 188
Sidewalk	Near Highland St	Arlington	32007019	\$377,900	6,834	102	\$ 5,640	1.083	\$ 61
Sidewalk	Near Highland St	Arlington	32007020	\$390,800	7,362	86	\$ 4,557	1.083	\$ 49
Sidewalk	Buliding Impact	Arlington	32007046	\$390,500	7,131	19	\$ 1,055	1.083	\$ 11
Sidewalk	Near Rolfe	Arlington	33003001	\$310,000	7,455	168	\$ 6,991	0.958	\$ 67
Sidewalk	near Quinn	Arlington	33003002	\$310,000	7,111	66	\$ 2,894	0.958	\$ 28

Table 6-17: (continued)

Guideway/Facility Type	Location	Jurisdiction	Parcel Number	Land Value	Total Parcel Area (sf)	Area of ROW Impact (sf)	Assessed Value of ROW Impact Area	Tax Rate per \$100 of Assessed Value	Property Tax Revenues Lost With Taking
Sidewalk	Near Rolfe	Arlington	33005012	\$294,500	5,064	332	\$ 19,309	0.958	\$ 185
Sidewalk	Near Rolfe	Arlington	33005013	\$297,600	5,187	285	\$ 16,360	0.958	\$ 157
Sidewalk	Navy Annex	Arlington	34014001	\$275,000	982,607	11,590	\$ 3,244	0.000	\$ -
Sidewalk	Navy Annex	Arlington	34015001	\$29,916,100	894,733	7,394	\$ 247,217	0.000	\$ -
Sidewalk	VDOT	Arlington	34015002	\$11,399,400	290,602	7,991	\$ 313,461	0.000	\$ -
Sidewalk	near Greenbrier	Arlington	22014PCA	\$1,683,900	97,422	42	\$ 734	0.958	\$ 7
Sidewalk	Side Road Taylor	Arlington	23034PCB	\$1,431,200	41,814	13	\$ 453	0.958	\$ 4
Sidewalk	near Quebec	Arlington	26026PEA	\$10,221,100	245,809	23	\$ 939	0.958	\$ 9
Sidewalk	near Frederick	Arlington	28003PCA	\$1,394,900	333,626	59	\$ 248	0.958	\$ 2
Sidewalk	near Greenbrier	Arlington	28004PCA	\$6,976,000	151,598	112	\$ 5,131	0.958	\$ 49
Sidewalk	Near Rolfe	Arlington	32001PCC	\$1,616,400	102,239	994	\$ 15,722	0.958	\$ 151
Stop (Planned)	Greenbrier WB	Arlington	22014005	\$1,499,900	47,520	488	\$ 15,412	0.958	\$ 148
Stop (Planned)	George Mason WB	Arlington	23033075	\$1,438,000	34,143	572	\$ 24,111	1.083	\$ 261
Stop (Planned)	Taylor WB	Arlington	23038019	\$11,990,000	262,720	88	\$ 3,995	0.958	\$ 38
Stop (Planned)	Oakland WB	Arlington	23039042	\$1,459,200	26,189	314	\$ 17,473	1.083	\$ 189
Stop (Planned)	Scott WB	Arlington	25020006	\$114,600	3,118	29	\$ 1,081	0.958	\$ 10
Stop (Planned)	Scott WB	Arlington	25020007	\$143,100	3,431	71	\$ 2,980	0.958	\$ 29
Stop (Planned)	Scott WB	Arlington	25020008	\$473,200	10,816	172	\$ 7,507	0.000	\$ -
Stop (Planned)	Oakland EB	Arlington	26002005	\$710,300	13,213	1,087	\$ 58,420	1.083	\$ 633
Stop (Planned)	Oakland EB	Arlington	26002006	\$1,068,800	19,063	209	\$ 11,736	1.083	\$ 127
Stop (Planned)	Taylor EB	Arlington	27002001	\$25,326,000	830,460	126	\$ 3,845	0.958	\$ 37
Stop (Planned)	Taylor EB	Arlington	27002002	\$901,100	28,096	350	\$ 11,224	0.958	\$ 108
Stop (Planned)	Scott EB	Arlington	32001002	\$10,371,600	164,695	573	\$ 36,068	0.958	\$ 346
Stop (Planned)	Barton EB	Arlington	32001039	\$369,000	6,596	224	\$ 12,518	1.083	\$ 136
Stop (Planned)	Barton EB	Arlington	32001040	\$614,900	11,074	830	\$ 46,088	1.083	\$ 499
Stop (Planned)	Glebe EB	Arlington	32007012	\$2,440,100	42,244	110	\$ 6,375	1.083	\$ 69
Stop (Planned)	Navy Annex WB	Arlington	34014001	\$19,602,000	982,607	371	\$ 7,401	0.000	\$ -
Stop (Planned)	Navy Annex EB	Arlington	34015002	\$11,399,400	290,602	843	\$ 33,054	0.000	\$ -
Stop (Under Construction)	Dinwiddie WB	Arlington	22014001	\$6,440,200	151,929	412	\$ 17,467	1.083	\$ 189
Stop (Under Construction)	Barton WB	Arlington	25016005	\$734,400	14,116	44	\$ 2,276	1.083	\$ 25
Stop (Under Construction)	Barton WB	Arlington	25016006	\$10,011,500	72,767	350	\$ 48,135	0.958	\$ 461
Stop (Under Construction)	Barton WB	Arlington	25016009	\$14,736,400	104,830	13	\$ 1,880	0.958	\$ 18
Stop (Under Construction)	Walter Reed EB	Arlington	32005004	\$2,536,000	46,103	87	\$ 4,789	1.083	\$ 52
Stop (Under Construction)	Dinwiddie EB	Arlington	28003PCA	\$1,394,900	333,626	67	\$ 282	0.958	\$ 3
<b>TOTAL</b>									<b>\$ 11,817</b>

Sources: AECOM and Arlington County Property Tax Assessment Maps<sup>21</sup>

<sup>21</sup> <http://www.arlingtonva.us/departments/realestate/reassessments/scripts/dreadefault.asp>

Table 6-18: Property Impacts Associated with Land Acquisitions for the TSM 2 Alternative

Guideway/Facility Type	Location	Jurisdiction	Parcel Number	Land Value	Total Parcel Area (sf)	Area of ROW Impact (sf)	Assessed Value of ROW Impact Area	Tax Rate per \$100 of Assessed Value	Property Tax Revenues Lost With Taking
Stop	Joyce EB + WB stops	Arlington	34015001	\$ 29,916,100	894,732.92	2,578	\$ 86,187	0.000	\$ -
Stop	Hayes EB	Arlington	35004001	\$ 55,880,100	731,754.90	243	\$ 18,554	1.083	\$ 201
Stop	Hayes EB	Arlington	35004005	\$ 529,900	8,844.62	185	\$ 11,098	0.000	\$ -
Stop	Army Navy EB	Arlington	35005031	\$ 49,639,100	585,244	94	\$ 7,951	0.958	\$ 76
Stop	Army Navy WB	Arlington	34017PLA	\$ 200,437,900	10,137,216	470	\$ 9,300	0.958	\$ 89
Transit Transfer Center	Jefferson St	Fairfax	0621 01 0016E	\$ 15,440,130	1,028,709	94,700	\$ 1,421,374	1.216	\$ 17,284
Stop	TSM Goodwin EB	Fairfax	0621 01 0016B	\$ 918,000	39,128.03	1,347	\$ 31,598	1.216	\$ 384
Stop	TSM Goodwin WB	Fairfax	0621 01 0016G	\$ 7,824,000	343,567.91	963	\$ 21,925	0.000	\$ -
Stop	TSM Jefferson EB	Fairfax	0623 01 0011	\$ 6,344,860	389,922.68	1,218	\$ 19,826	1.216	\$ 241
Stop	Skyline EB	Fairfax	0623 01 0028	\$ 7,140,270	471,100.51	1,246	\$ 18,878	1.216	\$ 230
Stop	Skyline WB	Fairfax	0623 01 0030	\$ 4,182,930	64,934.49	1,157	\$ 74,521	1.216	\$ 906
<b>TOTAL</b>									<b>\$ 19,411</b>

Sources: AECOM and Arlington County and Fairfax County Property Tax Assessment Maps<sup>22</sup>

<sup>22</sup> <http://www.arlingtonva.us/departments/realestate/reassessments/scripts/dreadefault.asp> and <http://icare.fairfaxcounty.gov/Search/GenericSearch.aspx?mode=ADDRESS>

### Streetcar Build Alternative - Jefferson Street Transit Center Design Option

The construction of the Jefferson Street Transit Center Design Option would result in nine partial land acquisitions, which would remove property from the tax base and thereby reduce the tax revenue generated in the two jurisdictions where the acquisitions would occur—Arlington County and Fairfax County. The total value of acquisitions would be \$4.7 million (2011 dollars). Of this \$3.1 million would take place in Arlington and the remaining \$1.6 million would occur in Fairfax. **Table 6-19** details the acquisitions and the tax revenue that would be lost.

While this would be an adverse impact, it is insignificant, as the total value of the acquisitions is 0.005 percent of the total property tax base in Arlington and 0.001 percent in Fairfax.

### Streetcar Build Alternative - Skyline Central Plaza Design Option

The construction of the Skyline Central Plaza Design Option would result in 14 partial land acquisitions, which would remove property from the tax base and thereby reduce the tax revenue generated in the two jurisdictions where the acquisitions would occur—Arlington County and Fairfax County. The total value of acquisitions would be \$5.6 million (2011 dollars). Of this \$3.2 million would

take place in Arlington and the remaining \$2.4 million would occur in Fairfax. **Table 6-20** details the acquisitions and the tax revenue that would be lost.

While this would be an adverse impact, it is insignificant, as the total value of the acquisitions is 0.005 percent of the total property tax base in Arlington and 0.001 percent in Fairfax.

### Streetcar Build Alternative - Skyline Route 7 Design Option

The construction of the Skyline Route 7 Design Option would result in 10 partial land acquisitions, which would remove property from the tax base and thereby reduce the tax revenue generated in the two jurisdictions where the acquisitions would occur—Arlington County and Fairfax County. The total value of acquisitions would be \$4.8 million (2011 dollars). Of this \$3.1 million would take place in Arlington and \$1.7 million would occur in Fairfax. **Table 6-21** details the acquisitions and the tax revenue that would be lost.

While this would be an adverse impact, it is insignificant, as the total value of the acquisitions is 0.005 percent of the total property tax base in Arlington and 0.001 percent in Fairfax.

**Table 6-19: Property Impacts Associated with Acquisitions for the Jefferson Street Transit Center Alternative**

Guideway/Facility Type	Location	Jurisdiction	Parcel Number	Parcel Assessed Land Value	Total Parcel Area (sf)	Area of ROW Impact (sf)	Assessed Value of ROW Impact Area	Tax Rate per \$100 of Assessed Value	Property Tax Revenues Lost With Taking
TPSS	Randolph TPSS	Arlington	23033074	\$3,285,100	58,840	4,400	\$ 245,655	1.083	\$ 2,660
TPSS	Oakland TPSS	Arlington	23039032	\$1,351,100	33,162	1,866	\$ 76,004	1.083	\$ 823
TPSS	Oakland TPSS	Arlington	23039045	\$297,400	7,670	2,535	\$ 98,275	1.083	\$ 1,064
Stop	Army Navy EB	Arlington	35005031	\$49,639,100	585,244	94	\$ 7,951	0.958	\$ 76
Stop	Army Navy WB	Arlington	34017PLA	\$200,437,900	10,137,216	470	\$ 9,300	0.958	\$ 89
Operations & Maintenance	Pentagon City	Arlington	35001018	\$0	40,250	27,889	\$ -		\$ -
Operations & Maintenance	Pentagon City	Arlington	35003012	\$36,219,500	248,568	1,724	\$ 251,262	1.083	\$ 2,721
Operations & Maintenance	Pentagon City	Arlington	35003014	\$23,325,000	145,216	15,327	\$2,461,788	1.083	\$26,661
Transit Center + roadway realignment	Jefferson St	Fairfax	0621.01.0016E	\$15,440,130	1,028,709	105,605	\$1,585,050	1.216	\$19,274
<b>TOTAL</b>									<b>\$53,370</b>

Sources: AECOM and Arlington County and Fairfax County Property Tax Assessment Maps<sup>23</sup>

<sup>23</sup> <http://www.arlingtonva.us/departments/realestate/reassessments/scripts/dreadefault.asp> and <http://icare.fairfaxcounty.gov/Search/GenericSearch.aspx?mode=ADDRESS>

**Table 6-20: Property Impacts Associated with Acquisitions for the Skyline Central Plaza Streetcar Build Alternative**

Guideway/Facility Type	Location	Jurisdiction	Parcel Number	Land Value	Total Parcel Area (sf)	Area of ROW Impact (sf)	Assessed Value of ROW Impact Area	Tax Rate per \$100 of Assessed Value	Property Tax Revenues Lost With Taking
TPSS	Randolph TPSS	Arlington	23033074	\$3,285,100	58,840	4,400	\$ 245,655	1.083	\$ 2,660
TPSS	Oakland TPSS	Arlington	23039032	\$1,351,100	33,162	1,866	\$ 76,004	1.083	\$ 823
TPSS	Oakland TPSS	Arlington	23039045	\$297,400	7,670	2,535	\$ 98,275	1.083	\$ 1,064
Operations & Maintenance	Pentagon City	Arlington	35001018	\$0	40,250	27,889	\$ -	1.083	\$ -
Operations & Maintenance	Pentagon City	Arlington	35003012	\$36,219,500	248,568	1,724	\$ 251,262	1.083	\$ 2,721
Operations & Maintenance	Pentagon City	Arlington	35003014	\$23,325,000	145,216	15,327	\$ 2,461,788	1.083	\$ 26,661
Stop	Army Navy EB	Arlington	35005031	\$49,639,100	585,244	94	\$ 7,951	0.958	\$ 76
Stop	Army Navy WB	Arlington	34017PLA	\$200,437,900	10,137,216	470	\$ 9,300	0.958	\$ 89
Guideway	Alignment - Skyline	Fairfax	0623 01 0028	\$7,140,270	471,101	8,988	\$ 136,235	1.216	\$ 1,657
Guideway	Alignment - Skyline	Fairfax	0623 01 0033	\$4,235,870	64,370	4,196	\$ 276,145	1.216	\$ 3,358
Guideway	Alignment - Skyline	Fairfax	0623 01 0035	\$2,965,100	67,940	344	\$ 15,013	1.216	\$ 183
Guideway	Alignment - Skyline	Fairfax	0623 01 0038B	\$11,635,940	220,123	4,741	\$ 250,629	1.216	\$ 3,048
Guideway/Stop	Alignment - Skyline	Fairfax	0623 01 0030	\$4,182,930	64,934	4,648	\$ 299,390	1.216	\$ 3,641
Transit Center + roadway realignment	Jefferson St	Fairfax	0621 01 0016E	\$15,440,130	1,028,709	95,965	\$ 1,440,361	1.216	\$ 17,515
<b>TOTAL</b>									<b>\$ 63,496</b>

Sources: AECOM and Arlington County and Fairfax County Property Tax Assessment Maps<sup>24</sup>

<sup>24</sup> <http://www.arlingtonva.us/departments/realestate/reassessments/scripts/dreadefault.asp> and <http://icare.fairfaxcounty.gov/Search/GenericSearch.aspx?mode=ADDRESS>

**Table 6-21: Property Impacts Associated with Acquisitions for the Skyline Route 7 Alternative**

Guideway/Facility Type	Location	Jurisdiction	Parcel Number	Land Value	Total Parcel Area (sf)	Area of ROW Impact (sf)	Assessed Value of ROW Impact Area	Tax Rate per \$100 of Assessed Value	Property Tax Revenues Lost With Taking
TPSS	Randolph TPSS	Arlington	23033074	\$3,285,100	58,840	4,400	\$ 245,655	1.083	\$ 2,660
TPSS	Oakland TPSS	Arlington	23039032	\$1,351,100	33,162	1,866	\$ 76,004	1.083	\$ 823
TPSS	Oakland TPSS	Arlington	23039045	\$297,400	7,670	2,535	\$ 98,275	1.083	\$ 1,064
Operations & Maintenance	Pentagon City	Arlington	35001018	\$0	40,250	27,889	\$ -	1.083	\$ -
Operations & Maintenance	Pentagon City	Arlington	35003012	\$36,219,500	248,568	1,724	\$ 251,262	1.083	\$ 2,721
Operations & Maintenance	Pentagon City	Arlington	35003014	\$23,325,000	145,216	15,327	\$2,461,788	1.083	\$26,661
Stop	Army Navy EB	Arlington	35005031	\$49,639,100	585,244	94	\$ 7,951	0.958	\$ 76
Stop	Army Navy WB	Arlington	34017PLA	\$200,437,900	10,137,216	470	\$ 9,300	0.958	\$ 89
Guideway	Alignment - Rt.7	Fairfax	0623 01 0028	\$7,140,270	471,101	18,014	\$ 273,025	1.216	\$ 3,320
Transit Center	Jefferson St	Fairfax	0621 01 0016E	\$15,440,130	1,028,709	94,700	\$1,421,374	1.216	\$17,284
<b>TOTAL</b>									<b>\$54,699</b>

Sources: AECOM and Arlington County and Fairfax County Property Tax Assessment Maps<sup>25</sup>

<sup>25</sup> <http://www.arlingtonva.us/departments/realestate/reassessments/scripts/dreadefault.asp> and <http://icare.fairfaxcounty.gov/Search/GenericSearch.aspx?mode=ADDRESS>

#### 6.4.4 Economic Development Impacts from Mobility

The Columbia Pike Transit Initiative corridor revitalization strategy is to migrate the commercial strip to new commercial nodes along the corridor, encouraging compact commercial development around the nodes to form village or town centers. This strategy would help to make the Columbia Pike Transit Initiative corridor more walkable and the nearby commercial opportunities more accessible. One of the key findings of the emerging “local accessibility” research is that “accessibility is a function of both proximity and connectivity.”<sup>26</sup>

Transit’s role in connecting residents to nearby and proximate retail and entertainment opportunities (fostering corridor interaction and accessibility) would be reinforced by the recognition that the average non-work trip length for person trips to/from corridor (within ¼ mile of the corridor) is just 6.2 miles.<sup>27</sup> If only trips within corridor are considered, the average trip length is one mile.<sup>28</sup> 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 cost savings for residents who take these trips. Collectively, this would improve the livability of the Columbia Pike corridor.

The potential economic development impacts from the improved mobility evaluated in this analysis include:

- Travel time/travel cost savings
- Property premiums for properties immediately adjacent to the alignment
- Opportunity for new development investment to the counties
- Opportunity for new development investment to the corridor
- Opportunity for an increase in the pace of corridor revitalization

#### Travel Time/Travel Cost Savings

The operation of the TSM 1, TSM 2, and Streetcar Build Alternatives would improve mobility within the study area relative to the No Build Alternative. These would be recurring benefits to corridor travelers that grow over time with ridership. There are some travel time savings associated with each alternative, and, there would be travel cost savings associated with diverting travelers from autos to transit. These annual travel time and travel cost savings are shown in **Tables 6-22** and **6-23** for 2030 for the TSM 1, TSM 2, and Streetcar Build Alternatives.

#### No Build Alternative

The No Build Alternative does not implement any transit service improvements that would attract new riders to the system, improve travel times, or lower the cost of travel in the study area. Rather, the No Build Alternative serves as the basis for the evaluation of the TSM 1, TSM 2, and Streetcar Build Alternatives.

#### TSM 1 Alternative

The TSM 1 Alternative would attract 432,000 new riders annually compared to the No Build Alternative and would generate \$2,218,922 in annual travel time savings and \$341,717 in annual travel cost savings for 2030. These travel time and travel cost savings support livability in the corridor and would be consistent with each county’s efforts to reduce households’ need to own cars.

#### TSM 2 Alternative

The TSM 2 Alternative would attract 1,065,900 new riders annually compared to the No Build Alternative and would generate \$4,548,273 in annual travel time savings and \$727,377 in annual travel cost savings for 2030. These travel time and travel cost savings support livability in the corridor and would be consistent with each county’s efforts to reduce households’ need to own cars.

#### Streetcar Build Alternative

The travel time and travel cost savings associated with the Streetcar Build Alternative would be greater than the savings associated with the TSM Alternatives. The Streetcar Build Alternative attracts 1,300,200 new riders annually compared to the No Build Alternative and generates \$5,180,148 in annual travel time savings and \$915,525 in annual travel cost savings for 2030. These cost savings support livability in the corridor and would be consistent with each county’s efforts to reduce households’ need to own cars.

<sup>26</sup> Gary Pivo and Jeffry Fisher. 2010. “The Walkability Premium in Commercial Real Estate Investments,” forthcoming in Real Estate Economics.

<sup>27</sup> Average length of all non-work trips to/from the corridor was provided by the AECOM travel demand model.

<sup>28</sup> Average length of all non-work trips within the corridor was provided by the AECOM travel demand model.

**Table 6-22: Annual Value of Travel Time Savings in 2030 (in 2011 dollars)**

Alternatives	Annual Time Savings (Hours)	Average Annual Wage per Hour (\$/Hour)	Value of Time	Annual Value of Travel Time Savings (2011\$)
<b>TSM 1 Alternative</b>				
Work	51,649	\$32.73	100%	\$1,690,604
Non-Work	32,281	\$32.73	50%	\$528,317
<b>TSM 2 Alternative</b>				
Work	110,670	\$32.73	100%	\$3,622,512
Non-Work	56,565	\$32.73	50%	\$925,761
<b>Streetcar Build Alternative</b>				
Work	125,524	\$32.73	100%	\$4,108,730
Non-Work	65,465	\$32.73	50%	\$1,017,417

Sources: AECOM calculation using the Travel Demand Model results, average wage for the Washington, DC MSA, and US DOT Guidance on Values of Time<sup>29</sup>

**Table 6-23: Annual Value of Travel Cost Savings in 2030 (in 2011 dollars)**

Alternatives	Annual New Riders	Average Auto Trip Length (Miles)	Auto Operating Cost per Mile (\$/Mile)	Auto Travel Cost Savings (2011\$)	Annual Transit Trip Cost (2011\$)	Annual Travel Cost Savings (2011\$)
TSM 1 Diversions from Auto (compared to No Build)	432,000	6.2	\$0.29	\$795,317	\$453,600	\$341,717
TSM 2 Diversions from Auto (compared to No Build)	1,065,900	5.9	\$0.29	\$1,846,572	\$1,119,195	\$727,377
Build Diversions from Auto (compared to No Build)	1,300,200	6.0	\$0.29	\$2,280,735	\$1,365,210	\$915,525

Sources: AECOM calculation using the Travel Demand Model results and AAA's "Your Driving Costs, 2010" escalated to 2011\$ using GDP Price Index Deflator<sup>30</sup>

<sup>29</sup> [http://ostpxweb.dot.gov/policy/reports/vot\\_guidance\\_092811c.pdf](http://ostpxweb.dot.gov/policy/reports/vot_guidance_092811c.pdf)

<sup>30</sup> <http://www.aaaexchange.com/Assets/Files/201048935480.Driving%20Costs%202010.pdf>

### Property Premium for Properties Immediately Adjacent to the Alignment

The operation of all alternatives would provide the property parcels immediately adjacent to the alignment with greater access to the Columbia Pike corridor as well as the broader metropolitan economy. Because the TSM Alternatives would not add permanent infrastructure investment along the corridor, large property value impacts are not anticipated for these alternatives; developers are less likely to invest private capital when there is a risk that buses can be readily rerouted.<sup>31</sup> The economic impact of streetcar access, and the value of walkable community centers indicate that there are often positive impacts on property values associated with such investments.<sup>32</sup> Recent research has demonstrated a “walkability premium” for commercial real estate investments ranging between one and nine percent, depending on property type.<sup>33</sup> Meaning, the Streetcar Build Alternative could have the greatest influence on property values along the corridor.

### No Build Alternative

The No Build Alternative includes many transportation investments; these are concentrated on amenities and improving the pedestrian and bicycle connections to the existing transit and street network. Thus, the improvements would generally improve the quality of the traveler’s experience, helping to sustain the economic vitality of the corridor even as other jurisdictions elsewhere in the region are also making infrastructure investments. As the No Build investments would largely improve the quality of the travel experience rather than generate mobility gains, the No Build is not expected to generate property premium impacts.

### TSM 1 Alternative

Modest travel time, cost, and capacity gains are anticipated if the TSM 1 Alternative is implemented. While these improvements would support economic development in the corridor, the modest size of these mobility gains limits their influence on existing property values.

### TSM 2 Alternative

The TSM 2 Alternative investments improve mobility in the corridor to a greater extent than the No Build and TSM 1 Alternative, supporting property values and investment in the corridor. While these mobility impacts are greater than those of TSM 1, their ability to generate property premium impacts is tempered by the fact that the bus improvements are not permanent (i.e. bus routes are easy to change). To generate property premium impacts, developers and property owners favor fixed route transit investments (i.e.

---

<sup>31</sup> AECOM, *District of Columbia Transit Improvements Alternatives Analysis Return on Investment Report*, DDOT, May 2005. Interview results indicated that developers preferred the fixed assets associated with the streetcar system.

<sup>32</sup> Center for Transit Oriented Development, *Capturing Value from Transit*, November 2008; Robert Cervero and M. Duncan, “Real Estate Market Impacts of TOD,” 2001.

<sup>33</sup> Gary Pivo and Jeffrey Fischer. 2010. “The Walkability Premium in Commercial Real Estate investments,” forthcoming in *Real Estate Economics*.

those with fixed track investments that are not easily moved), including streetcar service.<sup>34</sup>

### Streetcar Build Alternative

The combination of mobility gains and permanent investment associated with the Streetcar Build Alternative is anticipated to increase the value of existing properties in a way that the other alternatives cannot - conservatively estimated at 4 percent given the findings in the economic research.<sup>35</sup> The Streetcar Build Alternative accomplishes the mobility gains in a manner that is more consistent with the community’s vision of a Main Street commercial district. The qualities of the Streetcar Build Alternative are perceived to add the “ambiance of the urban cluster” in a way that expanded bus service does not - in part because they are more closely aligned with the desired character of the business districts. The greater integration between the type of transportation investment and community vision for a walkable Main Street yields a more supportive business climate in the corridor. Collectively, the mobility gains, the permanence of the investment, and the close alignment with the nature of the commercial district are anticipated to provide the greatest support for attracting investment and accelerating the revitalization of the corridor

Existing land parcels immediately adjacent to the corridor could yield an increase in value that ranges between \$84 million and \$95 million across the Streetcar Build Alternative design options, well above the value of land removed from the tax base for acquisitions. The Skyline Central Plaza design option could yield the greatest property value impact, followed by the Skyline Route 7 design option, and then Jefferson Street Transit Center design option. **Table 6-24** presents the potential gains in property values for each of the Streetcar Build Alternative design options.

---

<sup>34</sup> AECOM, *District of Columbia Transit Improvements Alternatives Analysis Return on Investment Report*, DDOT, May 2005. Interview results indicated that developers preferred the fixed assets associated with the streetcar system.

<sup>35</sup> Gary Pivo and Jeffrey Fischer. 2010. “The Walkability Premium in Commercial Real Estate investments,” forthcoming in *Real Estate Economics*. The research found that a 10 point increase in a location’s walkability score increased commercial property values by one to nine percent for office, retail and apartment buildings. No impact was observed for industrial properties.

**Table 6-24: Gains in Existing Properties Values for Parcels Immediately Adjacent to the Alignment**

	Land Assessed Value (2011)	Improvement Assessed Value (2011)	Value of Land Premium (2011)	Value of Improvement Premium (2011)	Annual Additional Property Tax Revenues (2011 tax rate)
<b>Jefferson Street Transit Center Design Option</b>					
Arlington County	\$728,324,300	\$1,235,776,000	\$29,132,972	\$49,431,040	\$752,643
Fairfax County	\$30,526,990	\$100,038,830	\$1,221,080	\$4,001,553	\$57,501
<b>Total</b>	<b>\$758,851,290</b>	<b>\$1,335,814,830</b>	<b>\$30,354,052</b>	<b>\$53,432,593</b>	<b>\$810,144</b>
<b>Skyline Central Plaza Design Option</b>					
Arlington County	\$728,324,300	\$1,235,776,000	\$29,132,972	\$49,431,040	\$752,643
Fairfax County	\$60,687,100	\$347,352,890	\$2,427,484	\$13,894,116	\$179,701
<b>Total</b>	<b>\$789,011,400</b>	<b>\$1,583,128,890</b>	<b>\$31,560,456</b>	<b>\$63,325,156</b>	<b>\$932,344</b>
<b>Skyline Route 7 Design Option</b>					
Arlington County	\$728,324,300	\$1,235,776,000	\$29,132,972	\$49,431,040	\$752,643
Fairfax County	\$37,667,260	\$117,535,240	\$1,506,690	\$4,701,410	\$68,351
<b>Total</b>	<b>\$765,991,560</b>	<b>\$1,353,311,240</b>	<b>\$30,639,662</b>	<b>\$54,132,450</b>	<b>\$820,994</b>

Notes:

Arlington County excludes parcels that were labeled inactive starting in tax year 2010 and umbrella parcels including: 28034PCB, 28035PCA, 26026PEA, 23039PCF, 23039PCE, 23039PCB, 23039PCD, 23039PCA, 22014PCA, 25021PCA, 34017PLA, 32001PCC, 23034PCB, 22011PCA, 28003PCA, 28004PCA, 28004PEA, and 35005PAA. These umbrella parcels could represent a significant portion of property values not captured in the analysis as many are condominium or multi-family residential properties.

The annual additional property tax revenues received due to the land and improvement premiums is based on the 2011 residential tax rates for Arlington and Fairfax counties. The residential tax rates are lower than commercial tax rates; therefore, the estimate provided is conservative. Please note that these revenues would change as the tax rates in each county change.

Sources: AECOM calculation using assessed property values from Arlington County and Fairfax County. Property values accessed using the following websites:  
<http://www.arlingtonva.us/departments/realestate/reassessments/scripts/dreadefault.asp>  
<http://icare.fairfaxcounty.gov/Search/GenericSearch.aspx?mode=PARID>

The increase in property values immediately adjacent to the Streetcar Build Alternative alignment would result in an increase in the tax bases for both Arlington and Fairfax counties, which translates into an increase in the annual property tax revenues that would be received by each county. An estimate of the potential increase in annual property tax revenues for Arlington County and Fairfax County associated with existing properties (does not include any new development or large scale redevelopment projects in the corridor) is also shown in **Table 6-24**. The property tax estimate is based on the 2011 residential tax rates for Arlington and Fairfax counties in an attempt to be conservative, given that the residential tax rates are lower than those for commercial properties in both counties.

While the Streetcar Build Alternative is expected to increase the value of land in the corridor, the potential impact on housing affordability would depend on the counties' policies toward housing. As a result, Arlington County and Fairfax County are studying potential policy changes that may be necessary to entice developers and owners to maintain the neighborhoods' stock of affordable housing.<sup>36</sup> While rising property values pose a risk to the corridor's affordability; loss of affordable housing stock due to disinvestment and physical distress poses a similar risk. The modest average property premium

<sup>36</sup> Dover, Kohl, & Partners, et al, *Columbia Pike Land Use & Housing Study, Arlington County, May 2011*.

anticipated for the Streetcar Build Alternative suggest that the recapitalization of the corridor can be managed with proactive policies that preserve affordability while yielding a more livable corridor for residents of all income levels.

#### Opportunity for New Development Investment to the Counties

The operation of the alternatives would provide improved access to the Columbia Pike corridor as well as the broader metropolitan economy, which could make the corridor more attractive to residential and commercial developers and help with the counties' revitalization efforts in the corridor. However, not all development attracted to the corridor as a result of the alternatives would be "new" development from the perspective of the counties. It is likely that a portion of any residential or commercial development would be a transfer from another location within Arlington or Fairfax counties. To determine the likelihood of each alternative to attract "new" development (from outside the counties/region) to the corridor, the analysis relied on preliminary developer survey and workshop findings identified as part of the Columbia Pike Transit Initiative Return on Investment Study.

#### No Build Alternative

The No Build Alternative includes many transportation investments; these are concentrated on amenities and improving the pedestrian and bicycle connections to the existing transit and street network. Thus, the improvements would generally improve the quality of the traveler's experience, helping to sustain the economic vitality of the corridor even as other jurisdictions elsewhere in the region are also making infrastructure investments. As the No Build investments would largely improve the quality of the travel experience rather than generate mobility gains, the No Build is not expected to attract new development to the counties.

#### TSM 1 Alternative

Modest travel time, cost, and capacity gains are anticipated if the TSM 1 Alternative is implemented. While these improvements would support economic development in the corridor, the modest size of these mobility gains limits their influence on attracting new development to the counties. Like the No Build investments, the TSM 1 Alternative investments would help sustain existing commercial investment by supporting the quality of life in the corridor and accommodating a small fraction of the projected growth in the corridor.

#### TSM 2 Alternative

The TSM 2 Alternative investments improve mobility in the corridor to a greater extent than the No Build and TSM 1 Alternative, supporting investment in the corridor. While these mobility impacts are greater than those of TSM 1, their ability to attract new development to the counties is tempered by the fact that the bus improvements are not permanent (i.e. bus routes are easy to change). To encourage new investment, developers favor fixed route transit

investments (i.e. those with fixed track investments that are not easily moved), including streetcar service.<sup>37</sup>

#### Streetcar Build Alternative

The Streetcar Build Alternative accomplishes the mobility gains in a manner that is more consistent with the community's vision of a Main Street commercial district. The qualities of the Streetcar Build Alternative are perceived to add the "ambiance of the urban cluster" in a way that expanded bus service does not - in part because they are more closely aligned with the desired character of the business districts. The greater integration between the type of transportation investment and community vision for a walkable Main Street yields a more supportive business climate in the corridor. Collectively, the mobility gains, the permanence of the investment, and the close alignment with the nature of the commercial district are anticipated to provide the greatest support for attracting new development to the counties.

#### Opportunity for New Development Investment to the Corridor

The operation of the alternatives would provide improved access to the Columbia Pike corridor as well as the broader metropolitan economy, which could make the corridor more attractive to residential and commercial developers and help with the counties' revitalization efforts in the corridor. Some of the development attracted to the corridor would be "new" development from the perspective of the corridor, as it would not have been previously located along the corridor in absence of the alternative. To determine the likelihood of each alternative to attract "new" development to the corridor, the analysis relied on preliminary developer survey and workshop findings identified as part of the Columbia Pike Transit Initiative Return on Investment Study.

#### No Build Alternative

The No Build Alternative includes many transportation investments; these are concentrated on amenities and improving the pedestrian and bicycle connections to the existing transit and street network. Thus, the improvements would generally improve the quality of the traveler's experience, helping to sustain the economic vitality of the corridor even as other jurisdictions elsewhere in the region are also making infrastructure investments. As the No Build investments would largely improve the quality of the travel experience rather than generate mobility gains, the No Build is not expected to attract new development to the corridor.

#### TSM 1 Alternative

Modest travel time, cost, and capacity gains are anticipated if the TSM 1 Alternative is implemented. While these improvements would support economic development in the corridor, the modest size of these mobility gains

---

<sup>37</sup> AECOM, *District of Columbia Transit Improvements Alternatives Analysis Return on Investment Report*, DDOT, May 2005. Interview results indicated that developers preferred the fixed assets associated with the streetcar system.

limits their influence on attracting new development to the corridor. Like the No Build investments, the TSM 1 Alternative investments would help sustain existing commercial investment by supporting the quality of life in the corridor and accommodating a small fraction of the projected growth in the corridor.

### TSM 2 Alternative

The TSM 2 Alternative investments improve mobility in the corridor to a greater extent than the No Build and TSM 1 Alternative, supporting investment in the corridor. While these mobility impacts are greater than those of TSM 1, their ability to attract new development to the corridor is tempered by the fact that the bus improvements are not permanent (i.e. bus routes are easy to change). To encourage new investment, developers favor fixed route transit investments (i.e. those with fixed track investments that are not easily moved), including streetcar service.<sup>38</sup>

### Streetcar Build Alternative

The Streetcar Build Alternative accomplishes the mobility gains in a manner that is more consistent with the community's vision of a Main Street commercial district. The qualities of the Streetcar Build Alternative are perceived to add the "ambiance of the urban cluster" in a way that expanded bus service does not - in part because they are more closely aligned with the desired character of the business districts. The greater integration between the type of transportation investment and community vision for a walkable Main Street yields a more supportive business climate in the corridor. Collectively, the mobility gains, the permanence of the investment, and the close alignment with the nature of the commercial district are anticipated to provide the greatest support for attracting new development to the corridor.

### Opportunity to Increase the Pace of Corridor Revitalization

Both Arlington County and Fairfax County have economic revitalization plans for the corridor to encourage a neighborhood-focused mix of commercial and residential development that is walkable and transit-friendly. The operation of the alternatives could help move this revitalization effort forward by providing improved transit access to and from the corridor. Due to improved transit access, each alternative could potentially encourage development that is planned for the corridor to occur sooner than it would without transportation investment. In this case the development is not new, but would be in place (and attracting residents, businesses, and employees) earlier than planned. To determine the likelihood of each alternative to increase the pace of corridor revitalization, the analysis relied on preliminary developer survey and workshop findings identified as part of the Columbia Pike Transit Initiative Return on Investment Study.

### No Build Alternative

The No Build Alternative includes many transportation investments; these are concentrated on amenities and improving the pedestrian and bicycle connections to the existing transit and street network. Thus, the improvements would generally improve the quality of the traveler's experience, helping to sustain the economic vitality of the corridor even as other jurisdictions elsewhere in the region are also making infrastructure investments. As the No Build investments would largely improve the quality of the travel experience rather than generate mobility gains, the No Build is not expected to increase the pace of the corridor revitalization.

### TSM 1 Alternative

Modest travel time, cost, and capacity gains are anticipated if the TSM 1 Alternative is implemented. While these improvements would support economic development in the corridor, the modest size of these mobility gains limits their influence on increasing the pace of the corridor revitalization. Like the No Build investments, the TSM 1 Alternative investments would help sustain existing commercial investment by supporting the quality of life in the corridor and accommodating a small fraction of the projected growth in the corridor.

### TSM 2 Alternative

The TSM 2 Alternative investments improve mobility in the corridor to a greater extent than the No Build and TSM 1 Alternative, supporting investment in the corridor. While these mobility impacts are greater than those of TSM 1, their ability to accelerate redevelopment is tempered by the fact that the bus improvements are not permanent (i.e. bus routes are easy to change). To encourage new investment, developers favor fixed route transit investments (i.e. those with fixed track investments that are not easily moved), including streetcar service.<sup>39</sup>

### Streetcar Build Alternative

The Streetcar Build Alternative accomplishes the mobility gains in a manner that is more consistent with the community's vision of a Main Street commercial district. The qualities of the Streetcar Build Alternative are perceived to add the "ambiance of the urban cluster" in a way that expanded bus service does not - in part because they are more closely aligned with the desired character of the business districts. The greater integration between the type of transportation investment and community vision for a walkable Main Street yields a more supportive business climate in the corridor. Collectively, the mobility gains, the permanence of the investment, and the close alignment with the nature of the commercial district are anticipated to provide the greatest support for accelerating the revitalization of the corridor.

<sup>38</sup> AECOM, *District of Columbia Transit Improvements Alternatives Analysis Return on Investment Report*, DDOT, May 2005. Interview results indicated that developers preferred the fixed assets associated with the streetcar system.

<sup>39</sup> AECOM, *District of Columbia Transit Improvements Alternatives Analysis Return on Investment Report*, DDOT, May 2005. Interview results indicated that developers preferred the fixed assets associated with the streetcar system.

## 6.5 Minimization and Mitigation Measures

### 6.5.1 Construction-related Impacts

#### No Build Alternative

Construction associated with the No Build Alternative would be minimal. As a result, no negative impacts on the region's economy have been identified in this analysis; no mitigation would be required as a consequence.

#### TSM 1 Alternative

Construction associated with the TSM 1 Alternative would not be significant enough to generate any impacts on commercial businesses. As a result, no negative impacts on the region's economy have been identified in this analysis, and no mitigation would be required as a consequence.

#### TSM 2 Alternative

Construction for TSM 2 Alternative would have temporary impacts on commercial businesses, particularly those near or adjacent to construction sites. Sidewalk space might be taken temporarily for station and alignment construction, thereby reducing access. Additional business impacts could include reduced visibility of commercial signs and businesses. These construction impacts could in turn produce economic impacts to commercial establishments.

There are a number of mitigation measures that could be undertaken to temper these impacts. County staff and personnel could:

- Contact and interview individual businesses to identify business usage, delivery, and shipping patterns, as well as critical times of the day or year for business activities to aid in developing Worksite Traffic Control Plans and to ensure that critical business activities are not disrupted.
- Develop, fund, and maintain during construction a telephone hotline and one or more County Field Offices with staff to address community issues and concerns as they arise. Office to be open from 9am-5pm weekdays and any weekends when work occurs. Schedule to be developed prior to construction. The office will provide a physical location where information pertaining to construction can be exchanged. Ensure that all potentially affected persons know the name and telephone number(s) of public affairs staff that they can contact if needed. The contractor staffing plan is subject to County review.
- Participate in local events to promote awareness of the project.
- Notify property owners, businesses, and residences of major construction activities (e.g., utility relocation/disruption and milestones; re-routing of delivery trucks).
- Provide literature to public and news media, schedule promotional displays, participate in community committees, and make presentations, as needed, about the project.

- Coordinate business outreach programs, and implement promotions for businesses most affected by the construction.

#### Streetcar Build Alternative

Construction for the Streetcar Build Alternative would have temporary impacts on commercial businesses, particularly those near or adjacent to construction sites. However, these impacts can be minimized or mitigated. For more detailed discussion of construction-related impacts, refer to Section 6.5.1, TSM 2 Alternative.

### 6.5.2 Operations-related Impacts

#### No Build Alternative

No negative impacts on the region's economy have been identified for the No Build Alternative; no mitigation would be required as a consequence.

#### TSM 1 Alternative

No negative impacts on the region's economy have been identified for the TSM 1 Alternative; no mitigation would be required as a consequence.

#### TSM 2 Alternative

No negative impacts on the region's economy have been identified for the TSM 2 Alternative; no mitigation would be required as a consequence.

#### Streetcar Build Alternative

No negative impacts on the region's economy have been identified for the Streetcar Build Alternative; no mitigation would be required as a consequence.

### 6.5.3 Tax Base Impacts

#### No Build Alternative

No adverse impacts were identified for the No Build Alternative; no additional mitigation would be required.

#### TSM 1 Alternative

No adverse impacts were identified for the TSM 1 Alternative; therefore, no additional mitigation would be required.

#### TSM 2 Alternative

No adverse impacts were identified. Temporary mitigation would be needed to address disruption caused by construction of the TSM 2 Alternative. No additional mitigation would be required.

#### Streetcar Build Alternative

No adverse impacts were identified. Temporary mitigation would be needed to address disruption caused by construction of the Streetcar Build Alternative. No additional mitigation would be required.

## 6.5.4 Economic Development Impacts

### No Build Alternative

No adverse impacts were identified for the No Build Alternative; no additional mitigation would be required.

### TSM 1 Alternative

No adverse impacts were identified for the TSM 1 Alternative; no additional mitigation would be required.

### TSM 2 Alternative

No adverse impacts were identified. Temporary mitigation would be needed to address disruption caused by construction of the TSM 2 Alternative. No additional mitigation would be required.

### Streetcar Build Alternative

If the potential property premium gains and revitalization are realized, there is a risk that the amount of affordable housing along the Streetcar Build Alternative corridor could decline. In anticipation of this risk, Arlington County is studying potential means to adjust and enforce their affordable housing policies to ensure that the current residents of the corridor can remain in the corridor and share in the benefits offered by the alternative.<sup>40</sup> Additionally, temporary mitigation would be needed to address disruption caused by construction of the Streetcar Build Alternative and any associated revitalization. No additional mitigation would be required.

---

<sup>40</sup> Dover, Kohl, & Partners, et al, Columbia Pike Land Use & Housing Study, Arlington County, May 2011.

This Page Intentionally Left Blank