4.0 Financial Analysis

This chapter describes the initial financial analysis and planning for the construction and operation of the Columbia Pike Transit Initiative.

Both Arlington and Fairfax Counties have included a "Columbia Pike Streetcar" project in their Capital Improvement Programs (CIPs).[1] The inclusion of the project in the CIP demonstrates a commitment by each County to provide the necessary local capital funding for the project. However, the implementation schedule and capital costs for the project included in the current CIPs are based on earlier rounds of project planning that were completed prior to this Alternatives Analysis/Environmental Assessment (AA/EA) effort. Therefore, the costs and revenues in this chapter differ from what is presented in the CIPs.

There are currently three design options under consideration as the Build Alternative. The three options are substantially similar in most respects, but they differ in the location of the proposed terminus at the western end of the alignment. The three options, which have been described in detail in Chapter 2 of this AA/EA document, "Alternatives Considered," are referred to as the Skyline Central Plaza Design Option ("Skyline Central"), the Skyline Route 7 Design Option ("Skyline Route 7"), and the Jefferson Street Transit Center Design Option ("Jefferson Street"). The design option presented for substantive analysis in this chapter is the Skyline Route 7 option. The other two options have estimated capital costs that are within five percent (or less) of Skyline Route 7, and therefore it is assumed that the funding approaches that would be pursued for those options would be substantially similar to the approaches presented here for Skyline Route 7.

Section 4.1 is the *Capital Funding Strategy*. This section summarizes the overall capital cost estimate for each of the three Build Alternative options as well as the TSM alternatives; presents a preliminary expenditure schedule of capital costs by major cost category; reviews the funding assumptions of other projects currently receiving or nearing agreement on FTA New Starts or Small Starts funding; and identifies the preliminary capital funding sources and funding shares for the Build Alternative and for the TSM alternatives.

Section 4.2 is the *Operating Funding Strategy*. This section summarizes the projected operating and maintenance costs for the opening year and design year and identifies the preliminary funding sources (including passenger revenues) that will support the ongoing operation and maintenance of the project.

Section 4.3 is a *Risk Assessment* of the capital and operating funding strategies. The risks are identified in a qualitative manner, given the current stage of project planning.

The financial analysis and planning documented in this AA/EA reflect a level of detail appropriate for a project in the Alternatives Analysis phase. Subsequent phases (specifically, Project Development for a Small Starts project or Preliminary Engineering for a New Starts project) will define the project at a greater level of detail and result in more reliable cost estimates and ridership estimates. From these subsequent estimates, a final financial plan will be generated.

4.1 Capital Funding Strategy

4.1.1 Capital Cost Estimate

The capital cost estimates for the two TSM Alternatives and the three Streetcar Build Alternative design options are order-of-magnitude estimates based on the project scope and definition as of April 2012. As the project continues to evolve and decisions are finalized regarding alignment, location of stops and facilities, and level of service, these cost estimates will be updated accordingly.

The capital cost estimates are based on an implementation schedule that assumes an opening date for the TSM Alternatives and the Build Alternative in 2016. Capital costs are estimated in year 2011 (or "base year") dollars and then escalated to year-of-expenditure (YOE) dollars. This financial analysis assumes an annual 3 percent rate of inflation for all costs using the assumed construction schedule. Based on previous experience with capital and operating cost growth, this is a reasonable assumption at this stage, but more detailed inflation forecasts (which are specific to each cost category and to Northern Virginia and the Washington metropolitan region) will be utilized in future financial analyses.

Table 4.1-1 summarizes the projected base year (2011) costs for the two TSM Alternatives, while Table 4.1-2 summarizes the projected base year costs for each of the three Build Alternative options. The Build Alternative design options range in cost from $214 million to $231 million, depending on the alignment, while TSM 1 costs $4 million and TSM 2 costs $47 million. There is no capital cost associated with the No Build Alternative.

[1] The FY11-FY16 CIP for Arlington County is available online at http://www.arlingtonva.us/departments/ManagementAndFinance/documents/file78592.pdf. The FY12-FY16 Advertised CIP for Fairfax County is available online at http://www.fairfaxcounty.gov/dmb/fy2012/advertised/cip.htm.

Table 4.1-1: Total Capital Costs for the TSM Alternatives (thousands of 2011 dollars, including allocated contingency)

Cat. No	Description	TSM 1	TSM 2
10	GUIDEWAY & TRACK ELEMENTS	$0	$0
20	STATIONS, STOPS, TERMINALS, INTERMODAL	$0	$7,634
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$0	$11,400
40	SITEWORK & SPECIAL CONDITIONS	$0	$0
50	SYSTEMS	$0	$0
60	ROW, LAND, EXISTING IMPROVEMENTS	$0	$3,959
70	VEHICLES	$3,718	$18,322
80	PROFESSIONAL SERVICES (Calc. on Subtotal 10 - 50)	$0	$2,082
90	UNALLOCATED CONTINGENCY (Calc. on Subtotal Cat. 10 - 80)	$507	$3,522
	Total Project	$4,225	$46,918

Table 4.1-2: Total Capital Costs for the Build Alternative Design Options (thousands of 2011 dollars, including allocated contingency)

Cat. No	Description	Skyline Central Plaza Design Option	Skyline Route 7 Design Option	Jefferson Street Transit Center Design Option
10	GUIDEWAY & TRACK ELEMENTS	$43,871	$37,154	$33,094
20	STATIONS, STOPS, TERMINALS, INTERMODAL	$5,803	$5,803	$5,397
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$14,398	$14,398	$14,398
40	SITEWORK & SPECIAL CONDITIONS	$16,739	$16,656	$16,851
50	SYSTEMS	$29,753	$29,543	$29,169
60	ROW, LAND, EXISTING IMPROVEMENTS	$12,101	$12,417	$12,133
70	VEHICLES	$51,597	$51,597	$51,597
80	PROFESSIONAL SERVICES (Calc. on Subtotal 10 - 50)	$33,930	$31,821	$30,410
90	UNALLOCATED CONTINGENCY (Calc. on Subtotal Cat. 10 - 80)	$22,543	$21,626	$21,003
	Total Project	$230,735	$221,014	$214,052
	Total Route Miles	5.0	4.9	4.7
	Cost Per Mile	$46,485	$44,809	$45,193

Table 4.1-3 and Table 4.1-4 provide the projected YOE costs for the TSM Alternatives, while Table 4.1-5 summarizes the same information for Skyline Route 7, given a preliminary assessment of the likely implementation schedule (i.e., the timing of expenditures in each major cost category) for each Alternative. The total YOE cost for Skyline Route 7 is estimated at $246 million, given an assumption of 3 percent annual inflation, while the YOE costs for TSM 1 and 2 are $5 million and $53 million, respectively. Any financing costs that might be necessary to cover delays or shortfalls in funding once construction begins are not included in these estimates. A more detailed implementation schedule and refined cost estimate for the locally preferred alternative will be developed during subsequent phases. The costs of Project Development are included in Category 80, in addition to insurance, environmental mitigation, program and construction management, and other professional services costs. The development of the capital estimate methodology and the categories used for reporting are consistent with FTA guidelines.

Table 4.1-3: Capital Costs for TSM 1 (thousands of YOE dollars)

Cat. No.	Description	Total	2011	2012	2013	2014	2015	2016	2017
10	GUIDEWAY & TRACK ELEMENTS	$0	$0	$0	$0	$0	$0	$0	$0
20	STATIONS, STOPS, TERMINALS, INTERMODAL	$0	$0	$0	$0	$0	$0	$0	$0
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$0	$0	$0	$0	$0	$0	$0	$0
40	SITEWORK & SPECIAL CONDITIONS	$0	$0	$0	$0	$0	$0	$0	$0
50	SYSTEMS	$0	$0	$0	$0	$0	$0	$0	$0
60	ROW, LAND, EXISTING IMPROVEMENTS	$0	$0	$0	$0	$0	$0	$0	$0
70	VEHICLES	$4,185	$0	$0	$0	$0	$4,185	$0	$0
80	PROFESSIONAL SERVICES (Calc. on Subtotal 10 - 50)	$0	$0	$0	$0	$0	$0	$0	$0
90	UNALLOCATED CONTINGENCY (Calc. on Subtotal Cat. 10 - 80)	$571	$0	$0	$0	$0	$571	$0	$0
	TOTAL PROJECT	$4,755	$0	$0	$0	$0	$4,755	$0	$0

Table 4.1-4: Capital Costs for TSM 2 (thousands of YOE dollars)

Cat. No.	Description	Total	2011	2012	2013	2014	2015	2016	2017
10	GUIDEWAY & TRACK ELEMENTS	$0	$0	$0	$0	$0	$0	$0	$0
20	STATIONS, STOPS, TERMINALS, INTERMODAL	$8,594	$0	$0	$0	$2,780	$2,864	$2,950	$0
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$12,835	$0	$0	$0	$4,152	$4,277	$4,405	$0
40	SITEWORK & SPECIAL CONDITIONS	$0	$0	$0	$0	$0	$0	$0	$0
50	SYSTEMS	$0	$0	$0	$0	$0	$0	$0	$0
60	ROW, LAND, EXISTING IMPROVEMENTS	$4,457	$0	$0	$0	$1,442	$1,485	$1,530	$0
70	VEHICLES	$20,627	$0	$0	$0	$6,674	$6,874	$7,080	$0
80	PROFESSIONAL SERVICES (Calc. on Subtotal 10 - 50)	$2,344	$0	$0	$0	$758	$781	$805	$0
90	UNALLOCATED CONTINGENCY (Calc. on Subtotal Cat. 10 - 80)	$3,966	$0	$0	$0	$1,283	$1,321	$1,361	$0
	TOTAL PROJECT	$52,822	$0	$0	$0	$17,090	$17,602	$18,130	$0

Table 4.1-5: Capital Costs for Skyline Route 7 Design Option (thousands of YOE dollars)

Cat. No.	Description	Total	2011	2012	2013	2014	2015	2016	2017
10	GUIDEWAY & TRACK ELEMENTS	$41,293	$0	$0	$5,912	$13,398	$13,800	$8,184	$0
20	STATIONS, STOPS, TERMINALS, INTERMODAL	$6,449	$0	$0	$923	$2,092	$2,155	$1,278	$0
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$16,003	$0	$0	$2,291	$5,192	$5,348	$3,171	$0
40	SITEWORK & SPECIAL CONDITIONS	$18,511	$0	$0	$2,651	$6,006	$6,186	$3,669	$0
50	SYSTEMS	$32,834	$0	$0	$4,701	$10,653	$10,973	$6,507	$0
60	ROW, LAND, EXISTING IMPROVEMENTS	$13,177	$0	$4,263	$4,391	$4,523	$0	$0	$0
70	VEHICLES	$58,525	$0	$0	$0	$14,095	$19,358	$19,938	$5,134
80	PROFESSIONAL SERVICES (Calc. on Subtotal 10 - 50)	$35,016	$1,591	$3,278	$6,752	$6,954	$7,163	$7,378	$1,900
90	UNALLOCATED CONTINGENCY (Calc. on Subtotal Cat. 10 - 80)	$24,140	$0	$0	$4,589	$5,908	$6,085	$6,268	$1,291
	TOTAL PROJECT	$245,949	$1,591	$7,541	$32,210	$68,822	$71,067	$56,393	$8,325

4.1.2 Funding for Other New Starts Projects

This chapter is a prelude to a formal Financial Plan within a federal New Starts/Small Starts (Section 5309) funding application. Given the size of the Skyline Route 7 Design Option of the Streetcar Build Alternative and the amount of federal funding requested by the Counties (less than $75 million, as explained below), the Columbia Pike project may be eligible for New Starts or Small Starts funding consideration. This will require that the project compete with other transit capital projects for this limited discretionary federal capital funding. Therefore, it is instructive to examine the projects that are currently receiving or nearing agreement with FTA on New Starts or Small Starts discretionary funding in order to understand what federal funding may be available to the project.

New Starts is the federal government's primary discretionary funding program for supporting locally-planned, implemented, and operated transit "fixed guideway" capital investments. Through this program, FTA provides grants to state and local governments and transit agencies for the development of new and improved transit facilities and services. Although the funding for New Starts is substantial – SAFETEA-LU originally authorized $6.6 billion in New Starts/Small Starts funding through FY09 – the demand for funding is even greater, and the program is highly competitive. Table 4.1-4 summarizes 30 major transit projects from across the country that have received recommendations for funding in FTA's FY2013 *Annual Report on Funding Recommendations* for Capital Investment and Paul S. Sarbanes Transit in Parks Programs.

As Table 4.1-6 demonstrates, New Starts projects vary widely in their total capital costs, from less than $200 million for the Draper Transit Corridor in Utah to many billions of dollars for major commuter rail and rapid transit investments in metropolitan New York and Northern Virginia. The amount of federal funding requested (as a percentage of the total capital cost) also varies widely, from as low as 24 percent to as high as 60 percent. The average federal funding share across all 21 New Starts projects shown in Table 4.1-6 is 39 percent. However, this figure is heavily influenced by the multi-billion dollar New York and Northern Virginia projects, which have relatively low federal funding on a percentage basis. The median federal funding share, on a percentage basis, is 50 percent.

Even within the subset of Small Starts projects (the final nine projects listed in Table 4.1-6), the projects vary substantially in their total capital costs and in the federal funding share of the project cost. The two largest projects have total capital costs of $198 million and $205 million, and both projects requested the maximum $75 million in Small Starts funding, resulting in a federal funding share of 38 and 36 percent, respectively. The seven remaining projects are smaller, ranging from $24 million to $125 million, and all have requested federal funding shares greater than 50 percent, with three at the statutory maximum of 80 percent.

Table 4.1-6: FY2013 New Starts Funding Recommendations

#	State	Project	Category[1]	Overall Project Rating	Total Project Cost	Total New or Small Starts Funding	New or Small Starts Funding Percentage
1	CO	Denver Eagle Commuter Rail	Existing	FFGA	$2,043,143,000	$1,030,449,000	50%
2	CT	Hartford New Britain - Hartford Busway	Existing	FFGA	$567,053,000	$275,300,000	49%
3	FL	Orlando Central Florida Commuter Rail Transit	Existing	FFGA	$357,225,011	$178,612,505	50%
4	MN	St. Paul-Minneapolis Central Corridor LRT	Existing	FFGA	$956,900,000	$473,950,000	50%
5	NY	New York Long Island Rail Road East Side Access	Existing	FFGA	$7,386,003,583	$2,632,113,826	36%
6	NY	New York Second Avenue Subway Phase I	Existing	FFGA	$4,866,614,468	$1,300,000,000	27%
7	TX	Dallas Northwest/Southeast LRT MOS	Existing	FFGA	$1,406,215,977	$700,000,000	50%
8	TX	Houston North Corridor LRT	Existing	FFGA	$756,008,000	$450,000,000	60%
9	TX	Houston Southeast Corridor LRT	Existing	FFGA	$822,919,000	$450,000,000	55%
10	UT	Salt Lake County Draper Transit Corridor	Existing	FFGA	$193,641,000	$116,184,600	60%
11	VA	Northern Virginia Dulles Corridor Metrorail Project	Existing	FFGA	$3,142,471,634	$900,000,000	29%
12	WA	Seattle University Link LRT Extension	Existing	FFGA	$1,947,682,000	$813,000,000	42%
13	CA	Sacramento South Sacramento Corridor Phase 2	Pending	Medium	$270,000,000	$135,000,000	50%
14	CA	San Francisco Third Street Light Rail Phase 2 - Central Subway	Pending	Medium-High	$1,578,300,000	$942,200,000	60%
15	CA	San Jose Silicon Valley Berryessa Extension Project	Pending	Medium	$2,330,021,971	$900,000,000	39%
16	HI	Honolulu High Capacity Transit Corridor Project	Pending	Medium-High	$5,125,955,000	$1,550,000,000	30%
17	OR	Portland Portland-Milwaukie Light Rail Project	Pending	Medium-High	$1,490,350,173	$745,175,087	50%
18	NC	Charlotte LYNX Blue Line Extension - Northeast Corridor	New	Medium-High	$1,069,217,178	$534,608,570	50%
19	CA	Los Angeles Regional Connector Transit Corridor	Other	Medium-High	$1,342,541,000	$671,265,090	50%
20	CA	Los Angeles Westside Subway Extension	Other	Medium	$5,662,347,180	$2,399,524,000	42%
21	WA	Vancouver Columbia River Crossing Project	Other	Medium-High	$3,507,872,000	$850,000,000	24%
22	AZ	Mesa Central Mesa LRT Extension	Small	Medium-High	$198,490,000	$74,999,999	38%
23	CA	Fresno Fresno Area Express Blackstone/Kings Canyon BRT	Small	Medium	$48,188,000	$38,550,000	80%
24	CA	Oakland East Bay BRT	Small	High	$205,481,000	$74,999,999	36%
25	CA	San Francisco Van Ness Avenue BRT	Small	Medium-High	$125,633,000	$74,999,999	60%
26	FL	Jacksonville JTA BRT North Corridor	Small	Medium	$33,482,000	$26,785,000	80%
27	FL	Jacksonville JTA BRT Southeast Corridor	Small	Medium	$23,877,000	$19,101,000	80%
28	MI	Grand Rapids Silver Line BRT	Small	Medium	$35,285,000	$28,228,000	80%
29	OR	Eugene West Eugene EmX Extension	Small	Medium	$95,567,000	$74,999,999	78%
30	TX	El Paso Dyer Corridor BRT	Small	Medium	$35,251,663	$20,407,094	58%

Source: Federal Transit Administration, FY2013 'Annual Report on Funding Recommendations,' Table 1

1 'Existing' indicates a project with a Full Funding Grant Agreement (FFGA) that is under construction or open for service.

'Pending' indicates a project which was first recommended for funding in prior year reports

'New' indicates a project that is being recommended for an FFGA in the FY13 New Starts report.

'Other' indicates a project that "may receive an FFGA should [it] make the necessary progress during FY 2013."

'Small' indicates a project that is being recommended for Small Starts funding in the FY13 New Starts report.

4.1.3 Capital Funding Sources for the TSM Alternatives

Neither the TSM 1 nor TSM 2 Alternatives have been included in the CIP of either County; therefore, no formal guidance is available on how these Alternatives might be funded if either were selected as the locally preferred alternative. However, based on informal guidance from Arlington County and Fairfax County transportation staff, the following funding plans for the TSM Alternatives appear reasonable for AA/EA planning purposes:

- The TSM 1 Alternative would be funded entirely through local capital funding sources, such as Arlington County's Transportation Capital Fund [see subsequent section for a more complete description].
- The TSM 2 Alternative would receive approximately one-third of the necessary capital funding from the Virginia Department of Rail and Public Transportation (DRPT). This represents the typical rate of reimbursement received from the Commonwealth of Virginia for bus purchases. The remaining capital funding would come from local funding sources.

The TSM 1 and TSM 2 funding plans are summarized below in Table 4.1-7 and Table 4.1-8.

Table 4.1-7: Preliminary Estimate of Capital Funding Sources for TSM 1 (000s of YOE dollars)

Source	Funding Amount	Funding Share
FTA New Starts or Small Starts (Section 5309)	$0	0%
Commonwealth of Virginia	$0	0%
Arlington and Fairfax Counties	$4,755	100%
TOTAL FUNDING FOR CAPITAL COSTS	$4,755	100%

Table 4.1-8: Preliminary Estimate of Capital Funding Sources for TSM 2 (000s of YOE dollars)

Source	Funding Amount	Funding Share
FTA New Starts or Small Starts (Section 5309)	$0	0%
Commonwealth of Virginia	$17,607	33%
Arlington and Fairfax Counties	$35,215	67%
TOTAL FUNDING FOR CAPITAL COSTS	$52,822	100%

4.1.4 Capital Funding Sources for the Build Alternative

If the Streetcar Build Alternative is selected as the locally preferred alternative and the project is successful in its proposed pursuit of New Starts or Small Starts grant funding, then the Federal Transit Administration (FTA), the Commonwealth of Virginia, and Arlington County and Fairfax County will provide the capital funding for the project. The proposed amount of capital funding from each party is shown in Table 4.1-9 below.

Table 4.1-9: Preliminary Estimate of Capital Funding Sources for Skyline Route 7 Design Option (000s of YOE dollars)

Source	Funding Amount	Funding Share
FTA New Starts or Small Starts (Section 5309)	$73,785	30%
Commonwealth of Virginia	$34,433	14%
Arlington and Fairfax Counties	$137,731	56%
TOTAL FUNDING FOR CAPITAL COSTS	$245,949	100%

These funding amounts are preliminary and approximate, and they would be expected to change in the future as the project moves through Project Development and as cost allocation agreements are negotiated between the various parties. However, at this stage of planning, these figures provide a useful reference point. The assumed share for FTA New Starts or Small Starts funding ($73.8 million, 30 percent) is slightly below the maximum potential funding amount of $75 million under the Small Starts program.

The assumption of 14 percent funding from the Commonwealth of Virginia is drawn from the recent experience of The Tide light rail transit project in Norfolk, Virginia. This project, which opened for service in August 2011, has received capital funding support from both the New Starts program and the Commonwealth. At this stage of planning, it is assumed that the Commonwealth continues to find this funding support appropriate for major transit projects that successfully compete for federal New Starts funds.[2] The state funding is expected to come from Virginia's Mass Transit Fund, which is managed by DRPT and which supports transit operations, capital, and special programs. The Mass Transit Fund receives its revenues, in turn, from the state's Transportation Trust Fund.

The remaining 56 percent of the Columbia Pike Transit Initiative's capital costs will be borne by the Counties of Arlington and Fairfax. A formal agreement will ultimately be required in order to allocate the remaining capital costs between the two counties, but project planning and design are not yet sufficiently advanced to know exactly what that allocation will be. The source or sources of the local funding are also not yet fully committed. Both Counties have expressed their intent (as noted in their CIPs) to fund their local share of the capital costs with proceeds from a real estate tax on commercial properties. This funding source is described in the Arlington County CIP as follows:

> *Arlington County's Transportation Investment Fund [subsequently renamed the Transportation Capital Fund] is a source of funding authorized by the General Assembly in 2007 enabling the County to*

[2] As of the writing of this document, the capital cost for the Norfolk Tide LRT project is substantially higher than was estimated in the original FFGA, and all parties have contributed additional resources to fill the funding gap. The original project sheet for the Norfolk Tide LRT is available at www.fta.dot.gov/documents/VA_Norfolk_LRT_07.doc.

levy an additional real estate tax on industrial and commercial properties for transportation initiatives. In April 2008, the Arlington County Board adopted a tax of $0.125 per $100 of assessed value, yielding projected revenues of $19.7 million in FY 2011 for transportation projects. The commercial real estate tax is proposed, beginning in FY 2013, to support bond financing. Proceeds of the tax are held in a separate fund.

Arlington County has also expressed interest in tax increment financing (TIF) as a way to capture the value produced by a premium transit investment and support the project capital costs. This approach may be considered as a source of "back-up" funding in case federal or state funding falls short of planned levels. These and other funding options will be explored in more detail as the project planning progresses.

4.2 Operating and Maintenance Funding Strategy

4.2.1 Operating and Maintenance Costs

Table 4.2-1 summarizes the estimated operating and maintenance (O&M) costs for each alternative in both 2016 (the project opening year) and 2030 (the design year or horizon year for ridership forecasting) and provides a range of costs for the Build Alternative. Only the 'Medium' estimate for the Build Alternative is presented in detail. The O&M costs have been escalated to year-of-expenditure (YOE) dollars using the same 3 percent annual inflation rate assumption as was used to inflate the capital cost projections. As with that analysis, future projections of O&M costs will utilize more detailed inflation forecasts. The methodology for estimating the O&M costs for the Build Alternative, as well as for the No-Build and TSM1 and TSM2 alternatives, is described in detail in Volume 2 (technical appendices) of the AA/EA document.[3]

Table 4.2-1: Annual Operating Costs for Columbia Pike Transit Initiative Alternatives (thousands of YOE dollars)

	No Build	TSM 1	TSM 2	Build Alternative		
				Low	Medium	High
Annual Operating Costs - 2016	$16,749	$23,281	$22,533	$22,536	$25,568	$29,611
Annual Operating Costs - 2030	$25,334	$35,214	$34,083	$34,087	$38,674	$44,789

[3] The O&M cost estimate for the No Build Alternative includes only WMATA bus services in the corridor and not ART bus services that directly serve the corridor. The TSM and Build Alternatives include a small incremental amount of service on ART route 41 (to ensure continued service to the Columbia Heights West neighborhood following the proposed modification of WMATA's 16G service), but no other ART bus services are included in the O&M cost estimates.

4.2.2 Operating Funding Sources

Table 4.2-2 summarizes the projected sources of operating funding for the alternatives in 2016 (the opening year). Table 4.2-3 provides the same information for the design year of 2030. As in the previous section on capital costs, the Skyline Route 7 design option for the Build Alternative is presented as the focus for analysis, on the assumption that a similar funding approach would be used if any of the three design options for the Build Alternative were selected. The key assumptions for this forecast include:

- *Ridership*: Daily ridership figures are taken directly from the travel demand forecasting results presented in Section 3.1 of the AA/EA document. This consistency between the ridership forecasting results and the cost and revenue estimation is a critical linkage that will be closely followed by FTA throughout the project evaluation process.[4]
- *Annualization*: The average weekday ridership figures from the ridership forecasting models are annualized using figures derived from the National Transit Database (NTD) 2009 summary of WMATA's Metrobus ridership.[5]
- *Average Fare Paid*: The average fare paid by WMATA Metrobus riders in FY2011 was $1.05, as reported in WMATA's FY12 Budget Book. This figure is used as the basis for projecting fare revenue and is assumed to grow with inflation throughout the analysis period.
- *State Operating Support*: The Commonwealth of Virginia supports the operations of transit systems across the state through a formula assistance program. In the past, this program has supported approximately 20 percent of agencies' total transit operating costs. However, this support has been declining in recent years, and given the growth in transit service in the state and reductions in available funding, an assumption of 15 percent state operating support appears more reasonable at this time.
- *Federal Grant Funds for Preventive Maintenance (PM)*: After seven years of operations of a new fixed guideway system, transit agencies may apply for and receive Section 5309 Fixed Guideway Modernization funds from the FTA. These grant funds are provided on a formula basis that depends on the amount of fixed guideway service provided (as measured by annual vehicle revenue miles and directional route miles). As with Section 5307 Urbanized Area Funds, the Fixed Guideway Modernization funds may be used to offset

[4] As noted, the O&M cost estimates do not include ART bus service in the corridor (with the exception of a small incremental amount of ART 41 service in the TSM and Build Alternatives). Therefore, the daily ridership figures in Tables 4.2-2 and 4.2-3 also do not include ART bus ridership in the corridor. This ensures that the projected fare revenue is comparable to the projected operating cost for each alternative.

[5] In the Build Alternative, both bus and streetcar modes will operate in mixed traffic along the corridor. Therefore, it is assumed that the streetcar will have operational characteristics (relating to ridership and fare revenue) that are similar to the existing bus service. For example, the streetcar will not be a "premium priced" service with higher fares than the buses.

preventive maintenance expenses. Should the project sponsors or local jurisdictions choose to use the new funding in this manner, it would be available to offset a modest amount of operating expenses. The estimate presented for 2030 for the Build Alternative assumes that the current unit grant amounts (i.e., dollar amount per vehicle revenue mile and per fixed guideway directional route mile) grow with inflation and thus stay constant in real terms. The additional Fixed Guideway Modernization funds would not be available if the No Build or TSM1/TSM2 alternatives are selected. The first year of availability of these funds would be 2023, assuming an opening year of 2016 for the Build Alternative.

Table 4.2-2: Operating Costs and Revenues in the Opening Year (2016) (thousands of YOE dollars)

	No Build	TSM 1	TSM 2	Build (Medium)
Total Annual Operating Costs	$16,749	$23,281	$22,533	$25,568
Ridership & Fare Revenue				
Total Daily Ridership	12,455	16,306	19,465	20,537
Annualization Factor	300	300	300	300
Total Annual Ridership	3,736,500	4,891,800	5,839,500	6,161,100
Average Fare Paid	$1.22	$1.22	$1.22	$1.22
Total Fare Revenue	$4,548	$5,954	$7,108	$7,500
Farebox Recovery Ratio	*27%*	*26%*	*32%*	*29%*
State Operating Support (Formula)				
DRPT Operating Assistance (%)	15%	15%	15%	15%
DRPT Operating Assistance ($)	$2,512	$3,492	$3,380	$3,835
Federal Grant Funds (Used for PM)*	$0	$0	$0	$0
Local Funding Requirement	$9,688	$13,834	$12,045	$14,233
Local Funding Increase Over No Build	--	$4,146	$2,356	$4,545

** Only available after 7 years of operation.*

Table 4.2-3: Operating Costs and Revenues in the Design Year (2030) (thousands of YOE dollars)

	No Build	TSM 1	TSM 2	Build (Medium)
Total Annual Operating Costs	$25,334	$35,214	$34,083	$38,674
Ridership & Fare Revenue				
Total Daily Ridership	13,758	18,136	21,794	23,376
Annualization Factor	300	300	300	300
Total Annual Ridership	4,127,400	5,440,800	6,538,200	7,012,800
Average Fare Paid	$1.84	$1.84	$1.84	$1.84
Total Fare Revenue	$7,599	$10,017	$12,038	$12,912
Farebox Recovery Ratio	*30%*	*28%*	*35%*	*33%*
State Operating Support (Formula)				
DRPT Operating Assistance (%)	15%	15%	15%	15%
DRPT Operating Assistance ($)	$3,800	$5,282	$5,112	$5,801
Federal Grant Funds (Used for PM)*	$0	$0	$0	$1,517
Local Funding Requirement	$13,935	$19,915	$16,932	$18,444
Local Funding Increase Over No Build	--	$5,980	$2,997	$4,509

** Only available after 7 years of operation. Estimate based on route miles and revenue vehicle miles.*

This preliminary analysis does not include any other operating revenue sources that could be used to offset the public subsidy required, such as joint development revenues, parking revenues, advertising, or concessions. Subsequent financial analyses will examine these potential revenue streams. However, the initial results appear reasonable when considering the estimated farebox recovery ratios. In FY2011, Metrobus recovered approximately 24 percent of its operating costs from passenger revenues, as compared to an estimate of 27 percent for the No Build bus-only option in 2016.

As indicated in the final line of each table, the key figure for the local jurisdictions is the increase in local funding over the No Build Alternative. That is, the local jurisdictions are already supporting significant transit services in the Columbia Pike corridor, so the costs of the TSM1, TSM2, and Build Alternative will not be entirely new costs. For example, for the Build Alternative in 2016, the total local contribution is projected at $14.2 million, but the net additional contribution will be $4.5 million.

4.3 Risks and Uncertainties

The funding strategy outlined in this chapter is intended to provide a reasonable starting point for project planning that is based on recent experience at both the federal and state levels. However, beyond the overall uncertainty associated with funding sources of federal and state partners,

several risks could affect the feasibility of the current project funding plan. These risks exist for both the capital and operating strategies.

4.3.1 Construction Cost and Revenue Risk

As noted earlier, the project capital costs presented in this EA document are relatively high-level, and the cost estimates will be refined and updated as the project moves through the preliminary engineering and final design phases. The capital cost estimate for the Build Alternative has already been subjected to a peer review by consultants and operators that have recently designed and built similar street-running streetcar and light rail projects. However, even as the cost estimates become more refined, actual construction costs may differ from estimates for a number of reasons, including:

- Unforeseen conditions, such as utility relocations or environmental mitigation
- Real cost inflation (either overall or for specific cost categories) which exceeds projections
- Scope or design changes
- Schedule delays

Costs may also increase if committed grant funding from federal, state, or local partners is not available on schedule, thus delaying the project.

4.3.2 Operating Cost and Revenue Risk

The actual net annual operating subsidy that must be covered by the local jurisdictions may vary from planning projections for a number of reasons, including:

- Real cost inflation for key operating cost drivers (e.g., fuel, operator wages and fringes) may exceed projections.
- Fare policies and transit and roadway levels of service may change, which may have a significant impact on transit ridership, fare revenue, and operating costs.

If a streetcar alternative is selected, there are broader risks associated with the fact that the streetcar mode of transit is not currently operated in the Washington metropolitan area. Although lessons can be learned from streetcar services in other parts of the country, there still is likely to be a "learning period" for a Northern Virginia streetcar that may be associated with higher costs, disruptions, and other uncertainties.

In addition, a streetcar would be a joint effort by Arlington County and Fairfax County, and would likely be delivered and operated by a new entity, rather than by an existing transit operator such as WMATA, ART, or Fairfax Connector. This could potentially generate additional institutional and funding risks, although both Arlington County and Fairfax County currently are federal grantees and have extensive experience delivering and operating public transit, which should help mitigate those risks.

4.3.3 Risk Assessment and Mitigation

As the Columbia Pike Transit Initiative progresses through the preliminary engineering and final design phases, the project sponsors must examine various responses that can be taken to mitigate risks and to preserve the financial viability of the project. These responses might include adjusting the project implementation schedule and staging; adjusting service growth; reviewing potential changes to fare policy; and exploring alternative project delivery structures. FTA has established procedures and processes for identifying, assessing, and mitigating these risks, and the project sponsors will work closely with FTA in developing appropriate strategies.