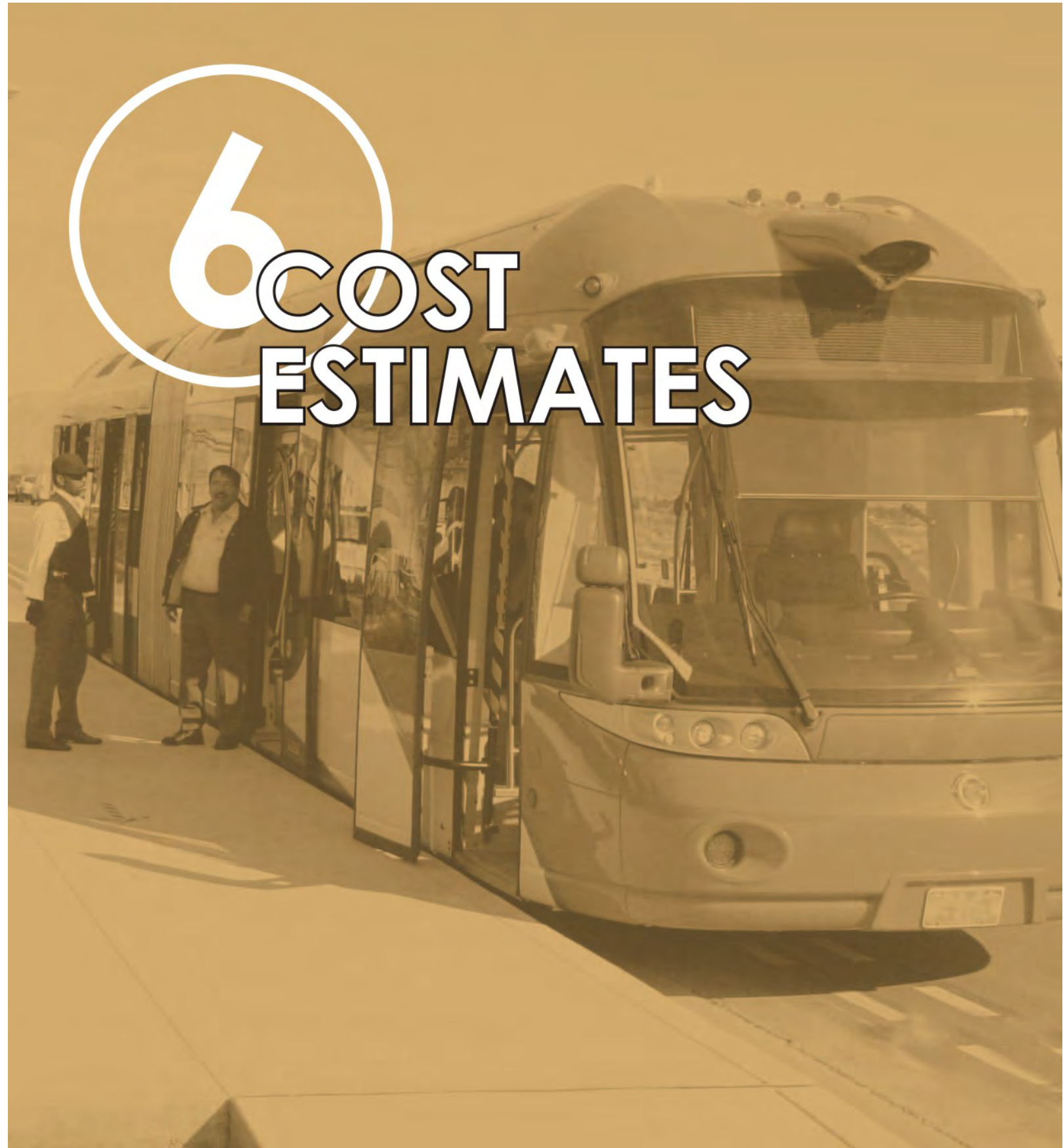


6

COST ESTIMATES



The Recommended Alternative could be designed and constructed under a number of financing options.

Chapter 6 → Cost Estimates

A. CAPITAL COSTS

1. Introduction

This chapter of the AA Report describes the organization and format for capital costs, the methodology and assumptions, and results. Capital costs for the three final alternatives have been developed based upon previous work performed for the K Street Transitway Study and the DC's Transit Future System Plan by DDOT. In the case of the K Street Transitway, the capital costs were developed based upon a greater level of conceptual engineering than has been developed for the Union Station to Georgetown AA Study. In the case of the DC's Transit Future System Plan, the work in this AA Study represents a greater level of detail than the system wide planning work. Costs in the K Street Transitway Study, were developed in 2009 dollars, while cost data for streetcars from the system wide planning work was obtained in 2012 dollars. All of these cost numbers have been escalated to current year, 2013 dollars, by applying 3% annual escalation. A projected year-of-expenditure (YOE) cost for the three final alternatives was also developed by escalating 3% per year to 2016, the estimated mid-point of construction for the project. [Note: If the next phase of project development results in a NEPA action for a Build Alternative, then DDOT may accelerate the design and construction of the recommended alternative using expedited delivery methods (perhaps a P3).] For vehicles, a 5% contingency was applied due to the lack of variability with purchasing versus construction.

2. Organization and Format

The capital costs are presented in FTA Standard Cost Category (SCC) Format. This format includes nine standard cost categories as follows:

- > Category 10 – Guideways and track elements
- > Category 20 – Stations
- > Category 30 – Yard and Shop (maintenance facilities)
- > Category 40 – Sitework and special conditions
- > Category 50 – Systems
- > Category 60 – Right-of-way
- > Category 70 – Vehicles
- > Category 80 – Professional Services
- > Category 90 – Unallocated Contingency

3. Methodology and Assumptions

Additional detail on the FTA SCC sub-categories is provided in this section.

- > **Category 10** – This category includes the trackwork and slab for the streetcar and generally no value for the premium bus alternative as it primarily operates on existing roadway. Values were used per linear foot based on the system wide streetcar studies.
- > **Category 20** – A lump sum value of \$450,000 per station for both bus and streetcar was used in 2012 dollars and escalated to 2013 for base year and 2016 for YOE dollars.
- > **Category 30** – A lump sum of \$12,500,00 in 2012 dollars was used to be consistent with values in the system wide streetcar studies, then escalated to 2013 and 2016 dollars. For buses, the assumption was made that the 12 buses required could be maintained in existing bus facilities and no capital costs were incurred.
- > **Category 40** – This category includes utility relocations, civil/roadway work needed to prepare the roadway for inclusion of track and new slab. It also includes traffic maintenance. For the portion in the three final alternatives along K Street, costs from the K Street Transitway project were used. The K Street reconstruction between Washington Circle and Mount Vernon Square was assumed to be re-constructed for three final alternatives. The K Street Transitway costs were \$139 Million in 2009 dollars, which equate to \$171 Million in 2016 year of expenditure dollars. The \$171 Million is incorporated into all of the three final alternatives, reformatted into appropriate FTA SCC categories. For the portions of the alternatives outside the K Street area, costs per linear foot were used consistent with the system wide streetcar studies. **Construction costs for reconstruction of the Hopscotch Bridge are not included in this cost estimate.**
- > **Category 50** – For Alternatives 1 and 2, this category includes a per linear foot cost for traffic signal and crossing protection, traction power supply and distribution, and communications, consistent with values used for the system wide streetcar studies. For Alternative 3, costs were only used for traffic signals and crossing protection. No additional values have been added for alternative/non-catenary propulsion alternatives as these could vary greatly in costs. For both streetcar and premium bus, a lump sum of \$2 Million in 2013 dollars was used for fare collection, although the specific fare collection methods have not yet been determined.
- > **Category 60** – At the level of analyses completed for this AA Study, no additional right-of-way beyond that already owned by the public would be required for the three alternatives. Therefore, no costs have been included for right-of-way. In the next phase of project development, small areas of right-of-way may be required.
- > **Category 70** – For streetcars, a lump sum of \$5 Million per vehicle in 2012 was used, and then escalated to 2013 and 2016, consistent with system wide streetcar values. For buses, a lump sum of \$1.25 Million per vehicle was used and then escalated to 2013 and 2016 dollars.
- > **Category 80** – The following percentages of Category 10-50 costs (including contingencies) are used:
 - > PE and Planning – 8%
 - > Final Design – 7%
 - > Program Management – 4%
 - > Construction Administration and Management – 12%
 - > Other soft costs – 4%
 This totals 35%; the percentage being used in the system wide streetcar studies.
- > **Category 90** – An unallocated contingency of 4% is used for Categories 10-80.

4. Results

Table 6-1 below provides a summary of capital costs for each of the three final alternatives.

For additional detail on the capital costs by alternative refer to **Appendix H** of this AA Report.

Table 6-1: Summary of Total Capital Cost Estimates by Alternative in Year-of-Expenditure Dollar Totals (2016)

FTA Standard Cost Categories (SCC)	Alternative 1 YOE Dollars Total (2016)	Alternative 2 YOE Dollars Total (2016)	Alternative 3 YOE Dollars Total (2016)
10 GUIDEWAY & TRACK ELEMENTS	\$32,722,803	\$38,574,160	N/A
20 STREETCAR/ BUS STATIONS	\$5,900,726	\$6,638,317	\$6,638,317
30 STREETCAR, YARD, SHOP	\$14,068,860	\$14,068,860	N/A

FTA Standard Cost Categories (SCC)	Alternative 1 YOE Dollars Total (2016)	Alternative 2 YOE Dollars Total (2016)	Alternative 3 YOE Dollars Total (2016)
40 SITEWORK & SPECIAL CONDITIONS (Utilities, Civil/ Roadwork, Temporary Facilities during Construction)	\$138,876,860	\$153,570,313	\$128,219,641
50 SYSTEMS	\$12,288,808	\$17,181,796	\$4,085,443
50.02 Traffic signals and crossing protection	\$1,779,397	\$2,641,147	\$1,899,989
50.03-50.04 Traction power supply & distribution	\$7,931,887	\$11,773,248	N/A
50.03-50.04 Alternative Propulsion	---	---	N/A
50.05 Communications	\$392,070	\$581,948	N/A
50.06 Fare collection system and equipment	\$2,185,454	\$2,185,454	\$2,185,454
Construction Subtotal (10-50)	\$203,858,056	\$230,033,445	\$138,943,401
70 VEHICLE (EA)	\$59,089,213	\$64,998,134	\$17,726,764
80 PROFESSIONAL SERVICES	\$71,350,320	\$80,511,706	\$48,630,190
80.01 Preliminary Engineering	\$16,308,645	\$18,402,676	\$11,115,472
80.02 Final Design	\$14,270,064	\$16,102,341	\$9,726,038
80.03 Project Management for Design and Construction	\$8,154,322	\$9,201,338	\$5,557,736
80.04 Construction Administration & Management	\$24,462,967	\$27,604,013	\$16,673,208
80.05 - 80.08 Other Soft Costs	\$8,154,322	\$9,201,338	\$5,557,736
Subtotal (10-80)	\$334,297,589	\$375,543,285	\$205,300,355
90 UNALLOCATED CONTINGENCY	\$13,371,904	\$15,021,731	\$8,212,014
TOTAL PROJECT COST (10-90)	\$347,669,492	\$390,565,017	\$213,512,369

5. Financing Options

The Recommended Alternative could be designed and constructed under a number of financing options. A final financing package could include some combination of the financing options listed below.

- > **Local Government Financing** – Under most financing options some level of local funding from DC government will likely be required. This may range from a majority of project funds to a local match for some form of federal funds, to some share of costs in a public-private partnership arrangement.
- > **USDOT Tiger Grant Funds** – The USDOT assists with transportation projects through Tiger Fund Grants. These grants are extremely competitive and would likely only assist with a small portion of total project funds.
- > **FTA Grants** – FTA assists in the funding of rail projects nationwide through various programs, including the Section 5309 New Starts Program. This program has historically contributed 50% of capital costs for approved projects, within a limited national funding cap.
- > **FHWA Funding** – DDOT utilizes FHWA funds for transportation projects and could look to use FHWA funds for a portion of the costs for the Recommended Alternative.
- > **Public-Private Partnership Funding** – DDOT could partner with private sector design/construction teams for design, construction, and potentially operation of the Recommended Alternative.

D. OPERATING COSTS

The inputs to the calculation of Operating Costs for both the Streetcar and Premium Bus alternatives are described below. For the Streetcar Alternatives, these assumptions are consistent with Streetcar planning work performed to date, both from system wide streetcar studies and this AA Study. For the Premium Bus Alternative, data was utilized from actual operating costs for the DC Circulator bus.

1. Streetcar Assumptions

Consistent with DC's Transit Future System Plan Final Report, April 2010, the following are used as input to calculate operating costs for Streetcar Alternatives 1 and 2:

- > Service at 10 minute headways during all hours of streetcar operation.
- > Hours of Operation:
 - > Monday-Thursday 6 AM to 12 AM
 - > Friday 6 AM to 2 AM
 - > Saturday 8 AM to 2 AM
 - > Sunday 8 AM to 10 PM
- > Operating Costs from the April 2010 DC's Transit Future System Plan Final Report at \$216.81 per revenue hour plus \$5.23 per revenue mile (in 2009 dollars). These costs combine those items which are hourly based such as operator wages, maintenance staff, and administrative support staff with those costs that are mileage based such as track and station maintenance and electricity.
- > Operating Costs for this AA Study are escalated to 2013 dollars using 3% rate per year from 2009 to 2013.
- > Travel times and mileage consistent with those provided in other sections of this AA Study, as follows:
 - > Alternative 1 – 3.41 miles, 23.9 minute one way travel time, which is an average of EB AM peak, EB PM peak, WB AM peak and WB PM peak travel times. No reduction in off-peak travel times was assumed although it is expected that travel times could be slightly less.
 - > Alternative 2 – 3.60 miles, 28.9 minute average one way travel time, computed as above.

2. Premium Bus Assumptions

For Premium Bus Alternative 3, the following inputs were used:

- > Service at 10 minute headways during all hours of premium bus operations.
- > Hours of Operation – same as for the Streetcar Alternatives 1 and 2
- > Operating Costs are based on system wide Circulator operating costs for calendar year 2012. These costs average to \$95 per revenue hour and are all-inclusive system wide numbers and do not need a per revenue mile component added.
- > Travel times and mileage consistent with those provided in other sections of this AA Study report, as follows:
 - > 3.67 miles, 26.2 minute one way travel time, which is an average of EB AM peak, EB PM peak, WB AM peak, WB PM peak travel times. No reduction in off-peak travel times was assumed although it is expected that travel times could be slightly less.
- > Operating costs for the premium bus were escalated one year at 3% from 2012 to 2013 dollars.

3. Annual Operations and Maintenance Costs

The **Table 6-2** summarizes the Annual Operations costs for each of the three build alternatives.

Table 6-2: Annual Operating Costs

	Annual Revenue Miles	Unit Cost per Revenue Mile	Mileage Based Annual Cost	Annual Revenue Hours	Unit Cost per Revenue Hour	Hourly Based Annual Cost	Total Annual O&M Costs 2009 dollars	Total Annual O&M Costs 2012 dollars	Total Annual O&M Costs 2013 dollars
Alternative 1 Streetcar	263,852	\$5.23	\$1,379,946	30,821	\$216.81	\$6,683,013	\$8,062,959	-	\$9,074,860
Alternative 2 Streetcar	278,554	\$5.23	\$1,456,835	37,269	\$216.81	\$8,081,133	\$9,537,968	-	\$10,734,982
Alternative 3 Premium Bus	N/A	N/A	N/A	33,788	\$95.00	\$3,209,814	-	\$3,209,814	\$3,306,108