

Crystal City/Potomac Yard Corridor Interim Transit Improvement Project

Draft Technical Memorandum:
Capital Cost Estimating Approach

December 2005

1.0 INTRODUCTION

This document outlines the methodology for estimating potential costs of interim transit improvements in the Crystal City/Potomac Yard corridor. Developed as a working document, the contents below have been shaped as the scope of improvements for Arlington County and the City of Alexandria gained definition throughout the implementation planning process. Elements of the estimate will continue to change as engineering design advances.

This phase of the Crystal City/Potomac Yard project comprises five main elements:

1. Public workshops to establish the scope and criteria for the proposed improvements,
2. An operations plan for the interim transit services,
3. Station area plans,
4. A summary of potential environmental implications of the transit improvements, and
5. An implementation strategy and schedule.

Each of these activities bears on the number and scope of physical improvements in the study corridor, and thus affects the level of investment in facilities, transit vehicles, and other associated items. At this stage it is appropriate to list the categories of improvements and specific items included, along with likely ranges of costs for each. It is anticipated that a more detailed assessment of capital costs associated with interim transit improvements will be done as part of initial design activities in the corridor.

Estimates for the transit improvements proposed for the study corridor are based on the following features, described in more detail below:

- Bus service enhancements along a clearly defined alignment (with variations) to include more frequent, specially branded service;
- New passenger facilities appropriate to the scale of existing and future development in the corridor;
- Low floor 40-foot CNG-fueled Metrobus vehicles;
- Allowances for expansion of existing storage and maintenance facilities to accommodate additional vehicles.

2.0 METHODOLOGY AND DATA SOURCES

Typical unit cost estimates shown for the improvements were derived from the previous Alternatives Analysis and augmented with cost data from other complete or ongoing projects in the U.S.

For construction line items as well as the overall scale of investment envisioned for the Crystal City/Potomac Yard area, this estimate makes use of costs from recent enhanced bus systems, including recent data on WMATA vehicle procurement, the proposed Houston Enhanced Bus project completed in 1999, and the recently constructed Silver Line project in Boston.

Unit costs are adjusted for the Washington, DC construction market using RS Means Building Construction Cost Data (2004) and escalated to 2005 dollars.

Guideway and Station Stop Configuration

At this stage, plans for configuration of the transitway along its entire length are under development. As part of the operations planning task for this study, each portion of the planned alignment (or alignment option) has been identified as one of two types: 1) exclusive guideway for transit vehicles, or 2) transit running in mixed traffic. It is assumed for the purposes of these estimates that dedicated lanes would be constructed with new, full-depth pavement, while mixed traffic portions of the transit alignment would be subject to only minor improvements occurring for the most part at transit stops.

In general, construction work in the transit corridors would be limited to exclusive transitway lanes. In the areas outside the two guideway lanes in the corridor streets, roadway reconstruction and other improvements would be limited, except at station platform locations and for critical transit-supportive facilities such as auxiliary bus pull-out areas, or communications equipment. Segments of South Clark and South Bell Streets in Arlington would be reconfigured, and Route 1 in Alexandria could involve significant reconstruction work to allow for designation of exclusive transit lanes.

At proposed station stops, two platforms, one for each direction of travel, would be constructed on each side of the street. These will be configured either within the existing sidewalk area or within the curb or parking lane of the street. For the mixed traffic portions of the corridor, the curb lanes of corridor streets would only be reconstructed within the limits of the station platforms. Under either guideway scenario, no curb or sidewalk reconstruction is assumed in the transit corridor streets other than at station platforms. Cost components of station construction include demolition and clearing of existing infrastructure, grading, placement of utilities, concrete footings, as well as platform costs, platform finishes, rampways, and guard railing.

Cost Tables

Unit costs, approximate quantities, and resulting cost ranges are shown in Tables 1 and 2 for Arlington and Alexandria, respectively. Physical improvements and vehicle fleets are apportioned between the jurisdictions according to the approximate length of the transit alignment.

Unit costs as presented in the previous Alternatives Analysis provide the starting point for the cost ranges. These unit costs are multiplied by quantities appropriate to the interim transit improvements that have been discussed during the service planning and station planning tasks. The result is a potential total cost for the interim improvements.

Further refinement of unit costs and quantities is anticipated as the scope of interim improvements becomes more focused. To represent the potential of these adjustments to reduce or increase estimated costs, two other columns are shown in the tables, for “low” and “high” values. The unit costs that support these values are taken from other similar projects or from estimates that vary from the Alternatives Analysis.

Table 1: Estimated Cost Ranges

Arlington Portion of Study Corridor

Total length (mi): 2.38
 Mixed traffic (mi): 0.68
 Exclusive guideway (mi): 1.7
 Number of typical stops: 9
 Number of smaller stops: 0

ITEM	UNIT	UNIT COST		QUANTITY	ITEM COST	
		Alt. (low)	Alt. (high)		Alternative Low	Alternative High
1.0 Busway Improvements						
1.1	Busway construction (2 lanes)	Sq. Feet	\$ 8	\$ 13	215,424	\$ 1,723,392 \$ 2,800,512
1.2	Misc. busway facilities	Route Feet	\$ 60	\$ 120	8,976	\$ 538,560 \$ 1,077,120
1.3	Special roadway construction	Route Feet (2)	\$ 200	\$ 400	1,000	\$ 200,000 \$ 400,000
1.4	Traffic signal priority system installation	Intersection	\$ 8,000	\$ 25,000	20	\$ 160,000 \$ 500,000
1.5	Additional intersection improvements	Intersection (3)	\$ 100,000	\$ 100,000	7	\$ 700,000 \$ 700,000
1.6	Utility relocations, public	Route Feet	\$ 350	\$ 550	8,976	\$ 3,141,600 \$ 4,936,800
1.7	Utility relocations, private	Route Feet	\$ 200	\$ 400	8,976	\$ 1,795,200 \$ 3,590,400
	Busway Improvements Subtotal					\$ 8,258,752 \$ 14,004,832
2.0 Station Stops (Includes Segment 1 stops, but not Pentagon City)						
2.1	CIP concrete platform slab with finishes (75' x 12')	sf.	\$ 100	\$ 180	16,200	\$ 1,620,000 \$ 2,916,000
2.2	CIP small concrete platform slab with finishes (30' x 8')	sf.	\$ 100	\$ 180	0	\$ - \$ -
2.3	Station canopy (40' x 12')	Ea.	\$ 150,000	\$ 250,000	18	\$ 2,700,000 \$ 4,500,000
2.4	Wind screen shelter	Ea.	\$ 15,000	\$ 25,000	0	\$ - \$ -
2.5	Station furnishings (lighting, benches, phone, bike racks, maps, etc.)	Ea.	\$ 20,000	\$ 25,000	18	\$ 360,000 \$ 450,000
2.6	Ticket vending machines	Ea.	\$ -	\$ -	0	\$ - \$ -
2.7	Concrete slab to prevent showing in pavement (125' x 12' x 9")	sy.	\$ 80	\$ 120	3,000	\$ 240,000 \$ 360,000
2.8	Display signs (Variable Message Board Equipment)	Ea.	\$ 5,000	\$ 10,000	18	\$ 90,000 \$ 180,000
	Station Stops Subtotal					\$ 5,010,000 \$ 8,406,000
3.0 Miscellaneous Items						
3.1	Environ. Mitig. (incl. Hazmat, Noise Reduct., etc.)	Route Mile	\$ 100,000	\$ 285,000	2.38	\$ 238,000 \$ 678,300
3.2	Maintenance of Traffic During Construction	% Constr.	5%	5%	busway + sta	\$ 663,438 \$ 1,120,542
3.3	Communication system, central control	allowance	\$ 100,000	\$ 100,000	1	\$ 100,000 \$ 100,000
3.4	Systems / Operations Testing	% Comm.	5%	5%	signal + mssg.	\$ 12,500 \$ 34,000
	Miscellaneous Items Subtotal					\$ 1,013,938 \$ 1,932,842
	SUBTOTAL CONSTRUCTION COSTS					\$ 14,282,690 \$ 24,343,674
4.0 Vehicle Costs						
4.1	Buses (40' Low Floor CNG)	Ea. (10)	\$ 370,000	\$ 420,000	14	\$ 5,034,848 \$ 5,715,233
4.2	Spares (40' Low Floor CNG)	Ea. (10)	\$ 370,000	\$ 420,000	2	\$ 794,976 \$ 902,405
4.3	Maintenance facilities construction allowance	Ea.	\$ 250,000	\$ 500,000	16	\$ 3,939,071 \$ 7,878,141
4.4	On-board communications equipment	Ea.	\$ 7,000	\$ 7,000	16	\$ 110,294 \$ 110,294
4.5	AVL (GPS, receiver, processor)	Ea.	\$ 5,000	\$ 5,000	16	\$ 78,781 \$ 78,781
4.6	Clever Devices Automated Stop Voice Annunciator, AVM and APC	Ea.	\$ 20,000	\$ 20,000	16	\$ 320,000 \$ 320,000
4.7	Branding (one-time allowance for vehicle paint, signage, etc.)	Ea.	\$ 10,000	\$ 20,000	16	\$ 157,563 \$ 315,126
	Vehicle Costs Subtotal					\$ 10,435,533 \$ 15,319,981
5.0 Owner Costs						
5.1	Right-of-Way Acquisition	Lump Sum (11)	not included	not included	1	\$ - \$ -
5.2	Planning, EA and Final Design Costs	% Constr.	8%	8%	constr. Subttl.	\$ 1,142,615 \$ 1,947,494
5.3	PM, CM and Admin.	% Constr.	13%	13%	constr. Subttl.	\$ 1,856,750 \$ 3,164,678
5.4	Owner's Insurance Program	% Constr.	5%	5%	constr. Subttl.	\$ 714,134 \$ 1,095,465
	Owner Costs Subtotal					\$ 3,713,499 \$ 6,207,637
6.0 Cost Contingency						
6.1	Contractor Cost Contingency	% Constr.	5%	20%	constr. Subttl.	\$ 714,134 \$ 4,868,735
6.2	Owner Cost Contingency	% Constr.	10%	10%	constr. Subttl.	\$ 1,428,269 \$ 2,434,367
	Cost Contingency Subtotal		15%	30%		\$ 2,142,403 \$ 7,303,102
	GRAND TOTAL					\$ 30,574,126 \$ 53,174,393

- (1) Alternative "high" and "low" unit costs obtained from WMATA Metrobus, Houston rapid bus, K Street Transitway study, and Boston Silver Line.
- (2) Allowance for construction of new roadway configuration at locations where there is no existing facility.
- (3) Potential traffic signal installation
- (4) Assuming 2 platforms/station with station platform components including demolition, clearing, grading, utilities, concrete footings and platform, finishes, ramps, and railings.
- (5) Exists only at large stations. "High" value reflects estimated value for Stop A location in Arlington.
- (6) "Off the shell" shelter used only at smaller platforms
- (7) Assuming 12 hours per typical platform and 8 hours per small platform.
- (8) Percentage based on construction subtotal: busway plus station stops
- (9) Percentage based on systems elements: signal priority system plus passenger information system
- (10) Fleet size assumes 2012 demand-based service, apportioned by estimated service hours: Arlington 179.55 per day; Alexandria 71.15 per day
- (11) Proportional to length of corridor within jurisdiction.

COMMENTS
Includes removal of asphalt pavement, grading, and placement of new, full-depth pavement. [\$9 K Street busway estimate; \$18 Dulles BRT estimate]
Includes pavement saw cuts, geotextile fabric, sidewalk construction, and limited curb and gutter work.
New roadway and reconfigured intersection required at Clark and 15th Streets. [\$255 Dulles corridor estimate: one lane of roadway, plus curb and sidewalk construction]
[\$8000 from Arlington County; \$25,000 based on DC experience with Georgia Ave. and escalated to include central system upgrades.]
Typical signalization project.
Assumes limited extent of public utilities reconfiguration: does not include major relocations. [Typical medium-level costs range from \$3 to \$5 million per route mile; Dulles "heavy urban" = \$7.9 million/mi.]
Assumes limited extent of private utilities reconfiguration: does not include major relocations. [Typical medium-level costs range from \$3 to \$5 million per route mile; Dulles "heavy urban" = \$7.9 million/mi.]
Includes demolition, clearing, grading, water and power connections, cip concrete platform, finishes, ramps, and lean rails. [\$100 based on Dulles corridor estimate; \$180 Houston LRT platforms]
[\$100 Houston rapid bus improvements; \$180 Houston LRT platforms]
[\$94 Dulles corridor estimate for bus canopy.]
[\$10,000 from DCAA rapid bus estimates; \$15,000 from Tampa estimate; \$20,000 Houston experience]
Includes light fixtures, benches, phone, bike racks, maps, and trash receptacles. [Based on Houston, Boston Silverline, and Tampa estimates.]
Not included.
Includes removal of existing pavement, grading, incidental utilities modifications, and sump drain.
[\$5,000 for DCAA rapid bus estimates]
[Based on Houston rapid bus and LRT costs.]
[Based on Houston rapid bus and LRT costs.]
Allowance [Dulles corridor estimate]
[Based on Houston rapid bus and LRT costs.]
Based on WMATA experience; "high" unit cost assumes CNG bus while "low" assumes low emission diesel.
Based on WMATA experience; "high" unit cost assumes CNG bus while "low" assumes low emission diesel.
Low = expand exist. Facility; High = build new facility [\$200,000 is based on the estimated cost of \$50 million for a 250-bus garage in the Phoenix area.]
Confirmed with WMATA experience
[\$5,000 for DCAA rapid bus estimates]
Based on WMATA experience.
Allowance for preparation of vehicles to suit corridor marketing approach.
From AA study
Typical WMATA experience
Typical WMATA experience
Typical WMATA experience
Quantity = sub. Constr.
Quantity = sub. Constr.

Intersections	Has Signal	Needs Signal
Wash Blvd. Access Rd./S. Fern St. (just south of terminal static)	1	1
Jeff Davis Access Rd./ S. Eads St.	0	0
Wash Blvd. Access Rd./ S. Eads St.	0	0
Pentagon Access Rd./S.Eads St. (exist. Stop sign)	0	1
HGSMem. HWY. Westbound Off ramp/S. Eads St.	0	0
HGS Mem. HWY Eastbound Off/On ramps/S. Eads St.	0	0
Army Navy Dr./ S. Eads St.	1	1
S.Eads St./12th	1	1
Army Navy Dr./ 12 St. S.	1	1
12th St. S./S. Clark St.	1	1
14th Rd. S./ S. Clark St. (new intersection for transitway)	0	1
15th St. S./ S. Bell St. (needs new signal phase for transitway)	1	2
18th St. S./S. Bell St.	1	1
S. Bell St./ 20th St. S.	1	1
20th St. S./S. Clark St.	1	1
23rd St.S./ S. Clark St.	1	1
S. Clark St./ 26th St. S. (exist. Stop sign)	0	1
26th St. S./ Crystal Dr. (new intersection for transitway)	1	2
27th St. S./Crystal Dr. (new intersection for transitway)	1	2
S.Glebe Rd./ Us1 (new intersection for transitway)	1	2
	13	20

Table 2: Estimated Cost Ranges

Alexandria Portion of Study Corridor

Total length (mi): 2.76
 Mixed traffic (mi): 1.96
 Exclusive guideway (mi): 0.8
 Number of typical stops: 7
 Number of smaller stops: 3

ITEM	UNIT	UNIT COST		QUANTITY	ITEM COST	
		Alt. (low)	Alt. (high)		Alternative Low	Alternative High
1.0 Busway Improvements						
1.1	Busway construction (2 lanes)	Sq. Feet	\$ 8	\$ 13	101,376	\$ 811,008 \$ 1,317,888
1.2	Misc. busway facilities	Route Feet	\$ 60	\$ 120	4,224	\$ 253,440 \$ 506,880
1.3	Special roadway construction	Route Feet	\$ 200	\$ 400	4,224	\$ 844,800 \$ 1,689,600
1.4	Traffic signal priority system installation	Intersection	\$ 8,000	\$ 25,000	13	\$ 104,000 \$ 325,000
1.5	Additional intersection improvements	Intersection	\$ 100,000	\$ 100,000	5	\$ 500,000 \$ 500,000
1.6	Utility relocations, public	Route Feet	\$ 350	\$ 550	4,224	\$ 1,478,400 \$ 2,323,200
1.7	Utility relocations, private	Route Feet	\$ 200	\$ 400	4,224	\$ 844,800 \$ 1,689,600
	Busway Improvements Subtotal					\$ 4,836,448 \$ 8,352,168
2.0 Station Stops						
2.1	CIP concrete platform slab with finishes (75' x 12')	(4) sf.	\$ 100	\$ 180	12,600	\$ 1,260,000 \$ 2,268,000
2.2	CIP small concrete platform slab with finishes (30' x 8')	(4) sf.	\$ 100	\$ 180	1,440	\$ 144,000 \$ 259,200
2.3	Station canopy (40' x 12')	(5) Ea.	\$ 150,000	\$ 250,000	14	\$ 2,100,000 \$ 3,500,000
2.4	Wind screen shelter	(6) Ea.	\$ 15,000	\$ 25,000	6	\$ 90,000 \$ 150,000
2.5	Station furnishings (benches, trash receptacles, maps, etc.)	Ea.	\$ 20,000	\$ 25,000	20	\$ 400,000 \$ 500,000
2.6	Ticket vending machines	Ea.	\$ -	\$ -	0	\$ - \$ -
2.7	Concrete slab to prevent shoving in pavement (125' x 12' x 9")	sy.	\$ 80	\$ 120	2,333	\$ 186,667 \$ 280,000
2.8	Display signs (Variable Message Board Equipment)	Ea.	\$ 5,000	\$ 10,000	14	\$ 70,000 \$ 140,000
	Station Stops Subtotal					\$ 4,250,667 \$ 7,097,200
3.0 Miscellaneous Items						
3.1	Environ. Mitig. (incl. Hazmat, Noise Reduct., etc.)	Route Mile	\$ 100,000	\$ 285,000	2.76	\$ 276,000 \$ 786,600
3.2	Maintenance of Traffic During Construction	(8) % Constr.	5%	5%	busway + sta	\$ 454,356 \$ 772,468
3.3	Communication system, central control	allowance	\$ 100,000	\$ 100,000	1	\$ 100,000 \$ 100,000
3.4	Systems / Operations Testing	(9) % Comm.	5%	5%	signal + mssg	\$ 8,700 \$ 23,250
	Miscellaneous Items Subtotal					\$ 839,056 \$ 1,682,318
	SUBTOTAL CONSTRUCTION COSTS					\$ 9,926,170 \$ 17,131,686
4.0 Vehicle Costs						
4.1	Buses (40' Low Floor CNG)	(10) Ea.	\$ 370,000	\$ 420,000	5	\$ 1,995,152 \$ 2,264,767
4.2	Spare (40' Low Floor CNG)	(10) Ea.	\$ 370,000	\$ 420,000	1	\$ 315,024 \$ 357,595
4.3	Maintenance facilities construction allowance	Ea.	\$ 250,000	\$ 500,000	6	\$ 1,560,929 \$ 3,121,859
4.4	On-board communications equipment	Ea.	\$ 7,000	\$ 7,000	6	\$ 43,706 \$ 43,706
4.5	AVL (GPS, receiver, processor)	Ea.	\$ 5,000	\$ 5,000	6	\$ 31,219 \$ 31,219
4.6	Clever Devices Automated Stop Voice Annunciator, AVM and APC	Ea.	\$ 20,000	\$ 20,000	6	\$ 120,000 \$ 120,000
4.7	Branding (one-time allowance for vehicle paint, signage, etc.)	Ea.	\$ 10,000	\$ 20,000	6	\$ 62,437 \$ 124,874
	Vehicle Costs Subtotal					\$ 4,128,467 \$ 6,064,019
5.0 Owner Costs						
5.1	Right-of-Way Acquisition	(11) Lump Sum	not included	not included	1	\$ - \$ -
5.2	Planning, EA and Final Design Costs	% Constr.	8%	8%	constr. Subttl	\$ 794,094 \$ 1,370,535
5.3	PM, CM and Admin.	% Constr.	13%	13%	constr. Subttl	\$ 1,290,402 \$ 2,227,119
5.4	Owner's Insurance Program	% Constr.	5%	5%	constr. Subttl	\$ 496,309 \$ 770,926
	Owner Costs Subtotal					\$ 2,580,804 \$ 4,368,580
6.0 Cost Contingency						
6.1	Contractor Cost Contingency	% Constr.	5%	20%	constr. Subttl	\$ 496,309 \$ 3,426,337
6.2	Owner Cost Contingency	% Constr.	10%	10%	constr. Subttl	\$ 992,617 \$ 1,713,169
	Cost Contingency Subtotal		15%	30%		\$ 1,488,926 \$ 5,139,506
	GRAND TOTAL					\$ 18,124,367 \$ 32,703,791

- Alternative "high" and "low" unit costs obtained from WMATA Metrobus, Houston rapid bus, K Street Transitway study, and Boston Silver Line.
- Allowance for construction of new roadway configuration at locations where there is no existing facility.
- Potential traffic signal installation
- Assuming 2 platforms/station with station platform components including demolition, clearing, grading, utilities, concrete footings and platform, finishes, ramps, and railings.
- Exists only at large stations. "High" value reflects estimated value for Stop A location in Arlington.
- "Off the shelf" shelter used only at smaller platforms
- Assuming 12 hours per typical platform and 8 hours per small platform.
- Percentage based on construction subtotal: busway plus station stops
- Percentage based on systems elements: signal priority system plus passenger information system
- Fleet size assumes 2012 demand-based service, apportioned by estimated service hours: Arlington 179.55 per day; Alexandria 71.15 per day
- Proportional to length of corridor within jurisdiction.

COMMENTS
Includes removal of asphalt pavement, grading, and placement of new, full-depth pavement. [\$9 K Street busway estimate; \$18 Dulles BRT estimate]
Includes pavement saw cuts, geotextile fabric, sidewalk construction, and limited curb and gutter work.
New roadway and reconfigured intersection required at Clark and 15th Streets. [\$255 Dulles corridor estimate: one lane of roadway, plus curb and sidewalk construction] [\$8000 from Arlington County; \$25,000 based on DC experience with Georgia Ave. and escalated to include central system upgrades.]
Typical signalization project.
Assumes limited extent of public utilities reconfiguration: does not include major relocations. [Typical medium-level costs range from \$3 to \$5 million per route mile; Dulles "heavy urban" = \$7.9 million/mi.]
Assumes limited extent of private utilities reconfiguration: does not include major relocations. [Typical medium-level costs range from \$3 to \$5 million per route mile; Dulles "heavy urban" = \$7.9 million/mi.]
Includes demolition, clearing, grading, water and power connections, cip concrete platform, finishes, ramps, and lean rails. [\$100 based on Dulles corridor estimate; \$180 Houston LRT platforms]
[\$100 Houston rapid bus improvements; \$180 Houston LRT platforms]
[\$94/sf Dulles corridor estimate for bus canopy.]
[\$10,000 from DCAA rapid bus estimates; \$15,000 from Tampa estimate; \$20,000 Houston experience]
Includes light fixtures, benches, phone, bike racks, maps, and trash receptacles. [Based on Houston, Boston Silverline, and Tampa estimates.]
Not included.
Includes removal of existing pavement, grading, incidental utilities modifications, and sump drain.
[\$5,000 for DCAA rapid bus estimates]
[Based on Houston rapid bus and LRT costs.]
[Based on Houston rapid bus and LRT costs.]
Allowance [Dulles corridor estimate]
[Based on Houston rapid bus and LRT costs.]
Based on WMATA experience; "high" unit cost assumes CNG bus while "low" assumes low emission diesel.
Based on WMATA experience; "high" unit cost assumes CNG bus while "low" assumes low emission diesel.
Low = expand exist. Facility; High = build new facility [\$200,000 is based on the estimated cost of \$50 million for a 250-bus garage in the Phoenix area.]
Confirmed with WMATA experience
[\$5,000 for DCAA rapid bus estimates]
Based on WMATA experience.
Allowance for preparation of vehicles to suit corridor marketing approach.
From AA study
Typical WMATA experience
Typical WMATA experience
Typical WMATA experience
Quantity = sub. Constr.
Quantity = sub. Constr.

Intersections	Has Signal	Needs Signal
S. Glebe Rd./Future Potomac Ave.	0	1
Future Potomac Ave./ theater access	0	1
Future Potomac Ave./ East Glebe Rd. extension	0	1
US1/ East Glebe Rd. extension	1	1
E. Raymond Ave./US1	1	1
Calvert Ave./US1	1	1
Swann Ave./US1	1	1
Fannon Ave./US1	1	1
E. Custis Ave./US1	1	1
E. Windsor Ave./US1	1	1
E. Howell Ave./US1	1	1
US. 1/ North Patrick St.y	0	1
First St./ North Patrick St.	0	0
N. Fayette St./ First St.	0	1
Madison St./ N. Fayette St.	0	0
	8	13

3.0 DESCRIPTIONS OF COST ITEMS

The descriptions below, organized by general cost category, contain specific assumptions pertaining to the cost estimates. In general, the descriptions relate to the improvements contemplated under the Interim Transit Improvement Project and may not reflect the assumptions going into the AA cost estimates.

Busway Facilities

For segments of exclusive guideway, street reconstruction work is limited to the two lanes in which the transit service will operate. Work includes sawcutting and removal of existing paving, and placement of 8-inch aggregate base and 12-inch bituminous concrete paving.

Miscellaneous busway facilities include pavement saw cuts, geotextile fabric, reconstruction of street pavement, and required relocation of street lights. No structural work (bridges, retained fill, or retained cut) is assumed.

For mixed traffic segments, the estimates for running way improvements include no allowance for construction, however striping and signage would be added in order to designate bus lanes.

At all signalized intersections, signal priority equipment would be added to facilitate efficient movement of transit vehicles.

Utilities

Utilities work assumes no site-specific survey information and reflects conditions that would be encountered in a “typical” urban area. The unit cost includes potential adjustments to storm drains, sanitary system, electric power, water, gas, public steam, etc. Also included are potential adjustments to communications conduit, television cable conduit, and other private utilities in the street. No preliminary information is assumed regarding the location or size of major known utilities in the corridor, so these costs represent a basic allowance for routine utility modifications.

Communication Systems

Communications equipment includes a simple GPS vehicle location system that provides information regarding the arrival of transit vehicles via a variable message sign (VMS) system at passenger stations. Radio equipment is installed on all vehicles and at a central dispatch center located within the storage/maintenance facility.

Station Stops

Typical platforms are 75 feet long and 14 inches high, with 15-foot ramps at one end. Side platforms of the curb-extension type (bulb-out) are constructed in the curb lane of the street and vary in width between 8 and 12 feet. At each stop location there are two platforms, one for each direction of travel. Construction costs include signage, lighting, and a simple shelter at each platform. No allowance is made for special finishes, custom pavers, or custom-designed shelters.

Smaller platforms are 30 feet long, varying in width between 8 and 12 feet. Amenities are assumed similar to the Arlington Super Stops currently under design.

Miscellaneous Items

The estimates include allowances for environmental mitigation, hazmat remediation (soil and/or water), and special noise-control measures.

Maintenance of traffic during construction includes temporary signage, electric sign boards, barrels, separation fencing, safety barricades, movable “Jersey barriers”, etc. and occasional use of traffic control officers.

A testing allowance for communications systems is added, consisting of 5% of the systems costs.

Right-of-Way Acquisition Costs

Throughout this study, the assumption was that all transit improvements would be done within existing public right-of-way. Therefore, no right-of-way acquisition costs were assumed in this estimate.

Owner Costs

Vehicles: Low floor, 40-foot, CNG buses, similar to those being procured for operation from WMATA's Four Mile Run bus facility. It is assumed that no separate procurement will be needed for vehicles. Transponders for vehicle signal priority would be installed in each of the buses. Vehicles may also require some additional equipment to enable level boarding; it may be useful to conduct a field test to see how close a standard bus can approach a platform.

Maintenance capacity is a per vehicle amount that assumes existing WMATA bus facilities would be expanded to accommodate additional vehicles.

Owner costs were assumed to be similar to current WMATA experience for planning, environmental assessment, final design, project management, construction management, and administrative costs. Estimates assume that the project will be a conventional design-bid-build project.

Typical costs are assumed for liability and accident insurance policy coverage during construction, as well as for agency agreements and utility fees.

Contingencies

A contractor cost contingency factor has been added to account for special, nonstandard, and unforeseen features and occurrences related to construction. An owner's contingency factor has been added to account for the owner's portion of special, nonstandard, and unforeseen features and occurrences.