

**TAB 1C**  
**BACKUP FOR NON-DTP COST REDUCTIONS**

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## **Cost Item 2: \$31.1 Million Reduction**

This item provides additional information in support of the cost mitigation initiatives for WMATA-related costs. Included are:

- Cost Mitigation Summary Status table with the highlighted cost mitigation values related to Owner-Agency costs.
- Excerpts from the October 2007 FTA Internal Pre-Decisional Document.
- PMOC Cost Reductions as Adjusted by PMSS.
- Letter from John Catoe to James Bennett, dated September 6, 2007.
- Letter from James Bennett to John Catoe, dated October 25, 2007.

Combining the Phase-1 and Phase-2 railcar fleet procurements results in a significant reduction of non-recurring costs related to both the carbuilder and WMATA. In addition, a review of WMATA's needs for maintenance vehicles and equipment in light of changes to the stations and other Project features resulted in a reduction in that budget. The supporting documents provide estimates by WMATA and the PMOC for the changes in costs and associated contingencies.

COST MITIGATION STATUS SUMMARY

(2)

Item No.	DESCRIPTION	YOES X 1,000,000			YOES X 1,000,000			YOES X 1,000,000							NOTES	
		CURRENT BUDGET ESTIMATES			BUDGET - FFP vs. ALLOWANCES			CONFIRMED CHANGES								
		Not Federal Project Eligible	Technology/Ops Change	VE/Scope	FFP per PMOC (with Contingency)	Allowance/Other per PMOC (with Contingency)	Total (with Contingency)	FFP			Allowance per PMOC		Owner-Agency			Total
Negotiated Scope Change	Not Federal Project Eligible per PMOC							Owner's Contingency	Scope Change	Not Federal Project Eligible	Owner-Agency Cost per PMOC	Owner's Contingency				
1.1	Optimize Improvements in West Falls Church Yard			\$ (27.9)	\$ (3.5)	\$ (24.4)	\$ (27.9)	\$ 0.5		\$ 0.1	\$ (20.0)		\$ (1.5)	\$ (2.9)	\$ (23.8)	FFP and Allowance Change Order Executed. Owner Agency savings are T&M work for deleted scope.
1.2	Route 7 Enhancements	\$ (99.0)			\$ (4.2)	\$ (94.7)	\$ (99.0)		\$ (3.7)	\$ (0.5)		\$ (11.7)	\$ (73.8)	\$ (9.3)	\$ (99.0)	Approved by FTA as Not Federal Project Eligible
1.3	Spring Hill Road Improvements	\$ (1.4)			\$ (0.2)	\$ (1.2)	\$ (1.4)		\$ (0.1)	\$ (0.0)		\$ (0.5)	\$ (0.6)	\$ (0.1)	\$ (1.4)	
1.4	Wiehle Avenue Garage built by Developer	\$ -			\$ -	\$ -	\$ -	\$ -		\$ -		\$ -			\$ -	No credit to be taken until Fairfax County reaches agreement with Developer.
1.5	Wiehle Avenue Bus Bays		\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -				\$ -	Remains in Project Scope.
1.6	Increase Min ATC design Headway & reduce Traction Power Requirements		\$ (13.0)		\$ (2.0)	\$ (11.0)	\$ (13.0)	\$ (2.0)		\$ (0.3)	\$ (9.6)			\$ (1.4)	\$ (13.3)	FFP and Allowance Change Order Executed.
1.7a	Use prefabricated Traction power Substations		\$ (8.4)		\$ (3.0)	\$ (5.4)	\$ (8.4)	\$ (3.6)		\$ (0.5)	\$ (4.7)			\$ (0.7)	\$ (9.4)	FFP and Allowance Change Order Executed.
1.7b	Use prefabricated Prewired signal houses		In 1.7a			In 1.7a					In 1.7a					
1.8	Use Microprocessor based ATC system design instead of present Relay Logic and discrete wiring		\$ (2.5)		\$ (0.2)	\$ (2.3)	\$ (2.5)	\$ (0.2)		\$ (0.0)	\$ (2.0)			\$ (0.3)	\$ (2.5)	FFP and Allowance Change Order Executed.
1.9	Use LAN/WAN TCP/IP communications system instead of present DTS technologies.		\$ -		\$ -	\$ -	\$ -	\$ 0.3		\$ 0.0	\$ -			\$ (0.0)	\$ 0.4	FFP and Allowance Change Order Executed.
1.10	Separate non-ATC communication systems from the ATC system		\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -			\$ -	\$ -	FFP and Allowance Change Order Executed.
1.11	Eliminate provisions for the future station at Wolf Trap			\$ (4.7)	\$ (4.7)	\$ -	\$ (4.7)	\$ (6.0)		\$ (0.9)	\$ -			\$ -	\$ (6.9)	FFP Change Order Executed.
1.12	Non-Recurring Rolling Stock Cost Allocation & Phasing	\$ (31.3)			\$ -	\$ (31.3)	\$ (31.3)						\$ (29.0)	\$ (2.2)	\$ (31.3)	WMATA has accepted the mitigations as mutually acceptable strategies as described in Mr. Catoe's letter to Mr. Bennett of September 6, 2007.
1.13	Reduce the number of maintenance vehicles and equipment			\$ (2.1)	\$ -	\$ (2.1)	\$ (2.1)						\$ (2.0)	\$ (0.1)	\$ (2.1)	
1.14	Use existing parking lots during construction of the Wiehle Avenue garage rather than building additional spaces.			\$ (2.0)	\$ (0.3)	\$ (1.7)	\$ (2.0)	\$ -		\$ -	\$ (1.6)			\$ (0.2)	\$ (1.8)	Allowance Change Order Executed.
1.15	Realignment to accommodate future 3rd lane widening	\$ (5.0)			\$ (1.2)	\$ (3.8)	\$ (5.0)		\$ (1.1)	\$ (0.2)		\$ (3.3)		\$ (0.5)	\$ (5.0)	MWAA has committed funding for these improvements from outside the Project
1.16	Implementation of revisions to stations			\$ (18.1)	\$ (3.1)	\$ (15.0)	\$ (18.1)	\$ 1.4		\$ 0.2	\$ (13.1)			\$ (1.9)	\$ (13.4)	FFP and Allowance Change Order Executed.
1.17	Platform Canopy length adjustment			\$ (8.5)	\$ (1.2)	\$ (7.3)	\$ (8.5)	\$ (0.4)		\$ (0.1)	\$ (6.4)			\$ (0.9)	\$ (7.7)	FFP and Allowance Change Order Executed.
1.18	Emergency Crossovers on the DIAAH	\$ (5.3)			\$ (1.3)	\$ (4.0)	\$ (5.3)		\$ (1.1)	\$ (0.2)		\$ (3.5)		\$ (0.5)	\$ (5.3)	MWAA has committed funding for these improvements from outside the Project
1.19	PMSS Contract adjustment			\$ (19.6)	\$ -	\$ (19.6)	\$ (19.6)						\$ (19.1)	\$ (0.5)	\$ (19.6)	MWAA and PMSS have agreed to an overall Phase 1 budget including this reduction.
TOTALS		\$ (141.9)	\$ (23.9)	\$ (82.9)	\$ (24.9)	\$ (223.7)		\$ (10.0)	\$ (6.0)	\$ (2.4)	\$ (57.4)	\$ (19.0)	\$ (126.1)	\$ (21.5)		
GRAND TOTAL		\$	\$ (248.6)	\$	\$	\$ (248.6)	\$	\$	\$ (18.4)	\$	\$	\$	\$ (224.0)	\$	\$ (242.3)	

PMOC Cost Reductions as Adjusted by PMSS

Non-recurring rolling stock cost allocation

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA	SCC Code	FFP	Allow	T&M	Real Est.	WMATA	Allocated OH	SCC Amount	Allocated Contingency	Unallocated contingency	Total Base Year	SCC Code
					\$24,632	70.02					\$24,632	0	\$24,632	\$1,143		\$25,775	70.02
Subtotal					\$0												
Subtotal Direct Costs	FFP Recovery	50%			\$0												
Engineering Costs					\$0												
Additional Redesign					\$0												
FD & CM/PM		29.6%			\$0												
Subtotal Engineering Effort					\$0												
Engineering Reduction (Recovery)		50.0%			\$0												
Indirect Costs Reduction		6.8%			\$0												
Contingency Reduction		20.0%			\$0												
WC/GL, Builder's Risk, BPOL		9.3%			\$0												
Overhead Recovery		50.0%			\$0												
Fee		7.5%			\$0												
Cost Reduction					\$0						\$24,632						
Allocated Contingency %					11.3%	11.3%	11.3%	2.4%			4.6%						
Allocated Contingency					\$0	\$0	\$0	\$0			\$1,143						
Unallocated Contingency		3.3%			\$0	\$0	\$0	\$0			\$813					\$813	\$813
Total Contingencies					\$0	\$0	\$0	\$0			\$1,956					\$1,956	
Total Cost					\$0	\$0	\$0	\$0			\$26,588					\$26,588	
<b>Total Project Cost</b>																	
											\$26,588						
Escalated Total	17.85%																
Escalation Without Owner's contingency																	
YOE Total Without Contingency																	

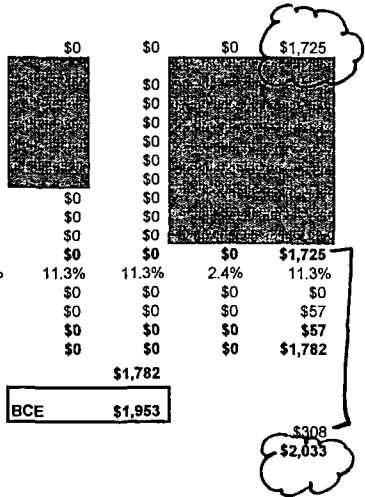
BCE \$31,334 \$0 Pending Phase 2  
 \$4,397  
 \$29,029

(2)

PMOC Cost Reductions as Adjusted by PMSS

Reduce the number of maintenance vehicles and equipment

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA	SCC Code	FFP	Allow	T&M	Real Est.	WMATA	Allocated OH	SCC Amount	Allocated Contingency	Unallocated contingency	Total Base Year	SCC Code
					\$1,500	70.06					\$1,500	0	\$1,500	\$0		\$1,500	70.06
					\$225	70.06					\$225	0	\$225	0		\$225	70.06
<b>Subtotal Direct Costs</b>					\$0					\$0							
<b>FFP Recovery 50%</b>					\$0					\$0							
<b>Subtotal</b>					\$0					\$0							
<b>Engineering Costs</b>					\$0					\$0							
Additional Redesign					\$0					\$0							
FD & CM/PM					\$0					\$0							
Subtotal Engineering Effort					\$0					\$0							
<b>Engineering Reduction (Recovery) 50.0%</b>					\$0					\$0							
Indirect Costs Reduction					\$0					\$0							
Contingency Reduction					\$0					\$0							
WC/GL, Builder's Risk, BPOL					\$0					\$0							
<b>Overhead Recovery 50.0%</b>					\$0					\$0							
Fee					\$0					\$0							
<b>Cost Reduction</b>					\$0					\$0							
Allocated Contingency %					\$0					\$0							
Allocated Contingency					\$0					\$0							
Unallocated Contingency					\$0					\$0						\$57	\$57
<b>Total Contingencies</b>					\$0					\$0						\$57	\$57
<b>Total Cost</b>					\$0					\$0						\$1,782	\$1,782
<b>Total Project Cost</b>					\$0					\$0						\$1,782	\$1,782
Consolidated escalation					\$0					\$0							
Disag. Escalation without contingency					\$0					\$0							
<b>YOE Total without Contingency</b>					\$0					\$0							
					\$0					\$0							



## FTA Internal Pre-Decisional Document

**Description of Change:** This proposal would eliminate the provision in the alignment to create a section of straight level track and provide the structural foundations near the guideway. Because of the slope of the DIAAH at this location, a significant adjustment is necessary in the track alignment including two large retaining walls and piles to support a future station. An emergency turnaround incorporated into the design of the alignment in this area, will not be built.

**Cost Item Summary:** The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$4.48 million, which also reflects the deletion of the costs associated with one DIAAH Emergency Crossover which had been designed as part of the station structure. Engineering costs will be incurred by MWAA to re-engineer the alignment and profile. The costs to engineering costs to design the required fill, piles, foundations, and retaining walls will be eliminated. The FFP includes \$4.13 million of this direct construction cost; the recovery of this amount and any other associated costs is subject to negotiation.

**Recommendation:** The PMOC supports \$4.675 million as the BCE value of cost savings for Item 1.11.

### Item 1.12 Non-recurring rolling stock cost allocation

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$24.018 million

**Description of Change:** The project budget was based on a stand-alone order for the design and manufacture of 64 cars. The proposal is to purchase all 128 cars for the Dulles Corridor Metrorail project in one order. Non-recurring costs for the design and testing are allocated to all cars of the base order. This reduction reflects the decrease in average per car cost when non-recurring costs are distributed over the entire 128 car order.

**Cost Item Summary:** WMATA has offered to MWAA that a cost reduction for the Phase 1 vehicles of \$24 million would be possible if the entire order of 128 cars for Phase 1 and Phase 2 of the DCMP were placed in a single order. This reduction is from the WMATA portion of the project budget.

Since the cost variation in this item relates primarily to market and bidding conditions, budget to be allocated to WMATA for rail vehicles will not be known until the rail vehicle contract is procured. WMATA has no risk in this procurement; therefore their offer of a \$24 million reduction should not be binding on MWAA. The PMOC has estimated that half of the estimated cost of design development is \$29.03 million based on the estimated procurement of \$190 million that was included in the August 2007 MWAA Project Budget. Including contingencies, the BCE cost reduction recommended would be \$31.3 million.

Realization of these savings is dependent on MWAA commitment to procure all 128 cars for the DCMP in a single order. As of this date, the PMOC is not aware that such a commitment has been made.

Includes Owner Contingency  
of \$2.2M

## FTA Internal Pre-Decisional Document

SEE ATTACHED MWAA LETTERS  
COMMITTING TO PHASE 2 AND  
DIRECTING A 128 CAR PROCUREMENT.

**Recommendation:** Given that MWAA has not committed to the procurement of 128 vehicles, the BCE reduction for non-recurring costs cannot be recommended. The PMOC supports \$0 as the BCE value of cost savings for Item 1.12 *at this time*.

### Item 1.13 Reduce the number of maintenance vehicles and equipment

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$1.809 million

**Description of Change:** WMATA reviewed and agreed to revise their list of maintenance vehicles and equipment to be purchased as part of the project to support maintenance of the Extension to Wiehle Avenue.

**Cost Item Summary:** This reduction is from the WMATA budget and from project contingencies. MWAA has the obligation under the MWAA-WMATA IGA to support the procurement of additional maintenance vehicles should this be shown to be needed. In prior reviews of this scope item, the PMOC expressed the view that this item was more than ample; it remains so at the proposed level.

**Recommendation:** The PMOC supports \$1.953 million as the BCE value of cost savings for Item 1.13.

*Includes Owner Contingency of \$0.1M*

### Item 1.14 Use existing parking lots during construction of the Wiehle Avenue Garage rather than building additional spaces

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$2.049 million

**Description of Change:** This proposal would eliminate the construction of new parking spaces to accommodate parking spaces lost to construction and construction staging at the existing Park-and-Ride Lot at Wiehle Avenue. The Design-Build Contractor's execution plan has changed and does not have the level of impact previously anticipated. Fairfax County has additional parking spaces available in other Fairfax county owned parking lots.

**Cost Item Summary:** This Item was priced as an Allowance Item in the Design-Build Contract. The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$1.21 million. The engineering costs associated with this change are minor, but since they are included in the FFP, recovery of this amount and any other associated costs is subject to negotiation.

**Recommendation:** The PMOC supports \$1.996 million as the BCE value of cost savings for Item 1.14.



October 25, 2007

Mr. John B. Catoe, Jr.  
General Manager  
Washington Metropolitan Area Transit Authority  
600 Fifth Street, NW  
Washington, DC 20001

RE: Dulles Corridor Metrorail Project  
Procurement of Railcars

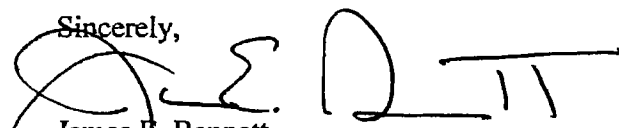
Dear Mr. Catoe:

The purpose of this letter is to request the Washington Metropolitan Area Transit Authority (WMATA) increase the number of railcars that WMATA is purchasing for this project from sixty-four to one hundred and twenty-eight. It is the intent of the Metropolitan Washington Airports Authority (Airports Authority) to purchase sufficient railcars to meet the requirements for Phase 2 of this project to Dulles Airport and into Loudoun County. (*The Agreement to Fund the Capital Cost of Construction of Metrorail in the Dulles Corridor* between the Airports Authority, Fairfax and Loudoun Counties dated September 11, 2007, provides for the funding for Phase 1 and Phase 2 of the Dulles Corridor Metrorail Project, including the one hundred twenty-eight railcars).

In the Cooperative Agreement between the Washington Metropolitan Area Transit Authority and the Metropolitan Washington Airports Authority for the Dulles Corridor Metrorail Project dated September 14, 2007, Article 2, Section 2: WMATA Scope A. CAPITAL EQUIPMENT DESIGN, PROCUREMENT INSTALLATION AND COMMISSIONING, 1. (a) Railcars states that "WMATA shall procure sixty-four railcars." It is the intent of the Airports Authority to increase this order and have WMATA procure one hundred twenty-eight railcars in order to obtain a better pricing structure for the railcars, associated equipment and engineering costs.

The Airports Authority will continue to work with WMATA to comply with the requirements of their Rail Fleet Management Plan and to provide the necessary funding to accomplish this request. Please contact me if there are any questions or concerns.

Sincerely,



James E. Bennett  
President and Chief Executive Officer

cc: Frank Holly, Jr.  
Charles S. Carnaggio



September 6, 2007

Mr. James E. Bennett  
President and CEO  
Metropolitan Washington Airports Authority  
1 Aviation Circle  
Washington DC 20001

Dear Mr. Bennett:

This is a follow up on the discussions that staff and I have had with you, your staff and consultants on the Dulles Corridor Metrorail Project. These discussions have focused on arriving at mutually acceptable strategies to achieve the Federal Transit Administration's (FTA) cost-effectiveness criteria so that the project can be advanced into the final design phase.

Please be assured that Metro is fully supportive of this project and appreciates the importance of securing FTA approval so final design can be initiated. I should also note, however, that the Metro Board has approved a scope for this project. In this context, I have to assure them that any changes are of a nature that do not alter Metro standards and/or increase downstream operating and maintenance costs that will have to be borne by all the Metro jurisdictions. As the future owner and operator of this significant and important extension, I have a responsibility to assure compliance with our standards and the conditions in our Board resolutions regarding this project.

As you are aware, there has been limited time to review the cost and background information we received from your consultants on the proposed changes. These will have to be refined during the final design phase. The changes that are outlined in the enclosure are acceptable to us with two caveats. First, we are agreeing to the nature of the proposed change; further refinements and specific definitions will not be possible until the project is in final design. Second, we are not in a position to verify the cost savings attributed to the change; rather, we are relying on the estimates that have been developed by the project consultants.

Washington  
Metropolitan Area  
Transit Authority

200 Fifth Street, NW  
Washington, DC 20001  
202/982-1234

By Metrorail:  
Bryant Square—Red Line  
City Place—Circulator—  
Red, Green and  
Yellow Lines  
By Metrobus:  
Routes D1, D3, D6, P6,  
70, 71, 80, X2

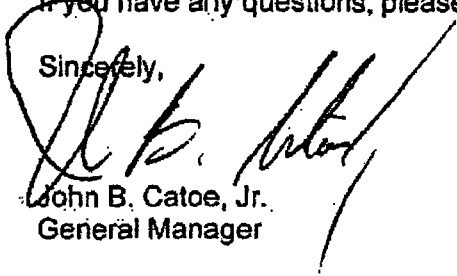
District of Columbia,  
Maryland and Virginia  
Transit Partners

Mr. James E. Bennett  
Page 2

I trust that you will find this information helpful in your current activities and deliberations to advance this project. As noted earlier, I am committed to helping in this effort within the parameters of our standards and Board policies.

If you have any questions, please do not hesitate to contact me.

Sincerely,



John B. Catoe, Jr.  
General Manager

Enclosure

cc: Pierce Homer, Secretary of Transportation  
Anthony H. Griffin, County Executive, Fairfax County

**DULLES CORRIDOR METRORAIL PROJECT**  
**COSTS SAVINGS OPPORTUNITIES RELATED TO METRO ITEMS**  
**SEPTEMBER 6, 2007**

Redesign of improvements to West Falls Church Yard (A-1)	\$23.0 million
Increase design headways for train control and traction power from 90 seconds to 135 seconds (D-2)	\$17.2 million
Use prefabricated traction power substations and train control rooms (E-1 and E-2)	\$12.6 million
Use microprocessor based train control design (E-3)	\$3.2 million
Use a LAN/WAN TCP/IP communication system (E-4)	\$1.7 million
Combined first phase and second phase rail car procurement (E-6)	\$20.3 million
Separate non train control communication systems from the train control system (E-7)	\$1.9 million
Reduce the quantity of maintenance vehicles and equipment (E-9)	\$1.5 million
Implementation of revisions to features such as platform canopy redesign, use of precast concrete instead of build in place, handrail redesign and roofing revisions (E-14)	\$13.9 million
Reduce the length of the platform canopies (E-15)	<u>\$7.3 million</u>
<b>TOTAL</b>	<b>\$102.6 million</b>

Note: dollar figures do not reflect any contingency adjustments

## **Cost Item 3A: \$19.1 Million Reduction**

This item provides additional information in support of the cost mitigation initiatives related to the PMSS Contract. Included are:

- Cost Mitigation Summary Status table with the highlighted cost mitigation values related to the PMSS Contract.
- Excerpts from the October 2007 FTA Internal Pre-Decisional Document.
- Letter from Eric Carey, MWAA's Contracting Officer, dated January 28, 2008.

This cost mitigation results from a refinement in PMSS scope and a recognition that some costs previously included in the Phase 1 budget should be assigned to Phase 2.

COST MITIGATION STATUS SUMMARY

BA

Item No.	DESCRIPTION	YOES X 1,000,000			YOES X 1,000,000			YOES X 1,000,000							NOTES	
		CURRENT BUDGET ESTIMATES			BUDGET - FFP vs. ALLOWANCES			CONFIRMED CHANGES								
		Not Federal Project Eligible	Technology/Ops Change	VE/Scope	FFP per PMOC (with Contingency)	Allowance/Other per PMOC (with Contingency)	Total (with Contingency)	FFP			Allowance per PMOC		Owner-Agency			Total
								Negotiated Scope Change	Not Federal Project Eligible per PMOC	Owner's Contingency	Scope Change	Not Federal Project Eligible	Owner-Agency Cost per PMOC	Owner's Contingency		
1.1	Optimize Improvements in West Falls Church Yard			\$ (27.9)	\$ (3.5)	\$ (24.4)	\$ (27.9)	\$ 0.5		\$ 0.1	\$ (20.0)		\$ (1.5)	\$ (2.9)	\$ (23.8)	FFP and Allowance Change Order Executed. Owner Agency savings are T&M work for deleted scope.
1.2	Route 7 Enhancements	\$ (99.0)			\$ (4.2)	\$ (94.7)	\$ (99.0)		\$ (3.7)	\$ (0.5)		\$ (11.7)	\$ (73.8)	\$ (9.3)	\$ (99.0)	Approved by FTA as Not Federal Project Eligible
1.3	Spring Hill Road Improvements	\$ (1.4)			\$ (0.2)	\$ (1.2)	\$ (1.4)		\$ (0.1)	\$ (0.0)		\$ (0.5)	\$ (0.6)	\$ (0.1)	\$ (1.4)	
1.4	Wiehle Avenue Garage built by Developer	\$ -			\$ -		\$ -	\$ -		\$ -		\$ -			\$ -	No credit to be taken until Fairfax County reaches agreement with Developer.
1.5	Wiehle Avenue Bus Bays		\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -				\$ -	Remains in Project Scope.
1.6	Increase Min ATC design Headway & reduce Traction Power Requirements		\$ (13.0)		\$ (2.0)	\$ (11.0)	\$ (13.0)	\$ (2.0)		\$ (0.3)	\$ (9.6)			\$ (1.4)	\$ (13.3)	FFP and Allowance Change Order Executed.
1.7a	Use prefabricated Traction power Substations		\$ (8.4)		\$ (3.0)	\$ (5.4)	\$ (8.4)	\$ (3.6)		\$ (0.5)	\$ (4.7)			\$ (0.7)	\$ (9.4)	FFP and Allowance Change Order Executed.
1.7b	Use prefabricated Prewired signal houses		In 1.7a		In 1.7a		In 1.7a		In 1.7a							
1.8	Use Microprocessor based ATC system design instead of present Relay Logic and discrete wiring		\$ (2.5)		\$ (0.2)	\$ (2.3)	\$ (2.5)	\$ (0.2)		\$ (0.0)	\$ (2.0)			\$ (0.3)	\$ (2.5)	FFP and Allowance Change Order Executed.
1.9	Use LAN/WAN TCP/IP communications system instead of present DTS technologies.		\$ -		\$ -	\$ -	\$ -	\$ 0.3		\$ 0.0	\$ -			\$ (0.0)	\$ 0.4	FFP and Allowance Change Order Executed.
1.10	Separate non-ATC communication systems from the ATC system		\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -			\$ -	\$ -	FFP and Allowance Change Order Executed.
1.11	Eliminate provisions for the future station at Wolf Trap		\$ (4.7)		\$ (4.7)	\$ -	\$ (4.7)	\$ (6.0)		\$ (0.9)	\$ -			\$ -	\$ (6.9)	FFP Change Order Executed.
1.12	Non-Recurring Rolling Stock Cost Allocation & Phasing	\$ (31.3)			\$ -	\$ (31.3)	\$ (31.3)						\$ (29.0)	\$ (2.2)	\$ (31.3)	WMATA has accepted the mitigations as mutually acceptable strategies as described in Mr. Catoe's letter to Mr. Bennett of September 6, 2007.
1.13	Reduce the number of maintenance vehicles and equipment		\$ (2.1)		\$ -	\$ (2.1)	\$ (2.1)						\$ (2.0)	\$ (0.1)	\$ (2.1)	
1.14	Use existing parking lots during construction of the Wiehle Avenue garage rather than building additional spaces.		\$ (2.0)		\$ (0.3)	\$ (1.7)	\$ (2.0)	\$ -		\$ -	\$ (1.6)			\$ (0.2)	\$ (1.8)	Allowance Change Order Executed.
1.15	Realignment to accommodate future 3rd lane widening	\$ (5.0)			\$ (1.2)	\$ (3.8)	\$ (5.0)		\$ (1.1)	\$ (0.2)		\$ (3.3)		\$ (0.5)	\$ (5.0)	MWAA has committed funding for these improvements from outside the Project
1.16	Implementation of revisions to stations		\$ (18.1)		\$ (3.1)	\$ (15.0)	\$ (18.1)	\$ 1.4		\$ 0.2	\$ (13.1)			\$ (1.9)	\$ (13.4)	FFP and Allowance Change Order Executed.
1.17	Platform Canopy length adjustment		\$ (8.5)		\$ (1.2)	\$ (7.3)	\$ (8.5)	\$ (0.4)		\$ (0.1)	\$ (6.4)			\$ (0.9)	\$ (7.7)	FFP and Allowance Change Order Executed.
1.18	Emergency Crossovers on the DIAAH	\$ (5.3)			\$ (1.3)	\$ (4.0)	\$ (5.3)		\$ (1.1)	\$ (0.2)		\$ (3.5)		\$ (0.5)	\$ (5.3)	MWAA has committed funding for these improvements from outside the Project
1.19	PMSS Contract adjustment		\$ (19.6)		\$ -	\$ (19.6)	\$ (19.6)						\$ (19.1)	\$ (0.6)	\$ (19.6)	MWAA and PMSS have agreed to an overall Phase 1 budget including this reduction.
<b>TOTALS</b>		\$ (141.9)	\$ (23.9)	\$ (82.9)	\$ (24.9)	\$ (223.7)		\$ (10.0)	\$ (6.0)	\$ (2.4)	\$ (57.4)	\$ (19.0)	\$ (126.1)	\$ (21.5)		
<b>GRAND TOTAL</b>		\$	\$ (248.6)	\$	\$	\$ (248.6)	\$	\$	\$ (18.4)	\$	\$	\$	\$ (224.0)	\$	\$ (242.3)	

**PMSS Original Budgeted Costs**

Total Project Labor Hours	\$	670,037	
Total Project Labor Dollars (2007 \$)	\$	79,608,007	
Other Direct Costs (2007 \$)	\$	6,525,000	
Labor Escalation	\$	8,403,507	
Direct Cost Escalation	\$	161,923	
<b>Total Costs (YOE \$)</b>	<b>\$</b>	<b>94,698,437</b>	<b>(A)</b>

**Cost Mitigation Adjustment**

Base Year Cost Reduction	\$	(17,226,601)	
Escalation Reduction	\$	(1,774,683)	
	\$	(19,001,284)	<b>(B)</b>

**Revised Total PMSS Budgeted Costs (YOE \$)**      **\$ 75,697,153 (A)-(B)**

PMOC Cost Reductions as Adjusted by PMSS

3A

PMSS contract adjustment

Line Item Description	69000 23000 92000 20% 86133	FFP	Allowances	T&M	Real Est.	MWAA	Unallocat ed contingen cy	Total Base Year	SCC Code
		FFP	Allow	T&M	Real Est.	MWAA	Allocated Contingen cy	Allocated OH	SCC Amount
Base year value					\$17,227				\$17,227
Subtotal Direct Costs	FFP Recovery 50%				\$0	\$17,227			\$0
Engineering Costs									
Additional Redesign FD & CM/PM	29.6%				\$0				
Subtotal Engineering Effort					\$0				
Engineering Reduction (Recovery)	50.0%				\$0				
Indirect Costs Reduction	6.8%				\$0				
Contingency Reduction	20.0%				\$0				
W/C/GL, Builder's Risk, BPOL	9.3%				\$0				
Overhead Recovery	50.0%				\$0				
Fee	7.5%				\$0				
Cost Reduction					\$0				
Allocated Contingency %	11.3%				\$0				
Allocated Contingency					\$0				
Unallocated Contingency	3.3%				\$0				
Total Contingencies					\$0				\$568
Total Cost					\$0				\$568
Total Project Cost					\$17,795				\$17,795
Disag. Escalation without contingency	Calculated in YOE 9.61%				\$19,505				\$19,505
YOE Total without Contingency					\$19,001				\$19,001

## FTA Internal Pre-Decisional Document

### Item 1.19 PMSS Contract Adjustment

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$27.066 million

**Description of Change:** The staffing for MWAA technical support and management oversight of the Project was based on the DCMP Phase 1 work being a stand-alone project. MWAA's current commitment to building Phase 2 has enabled MWAA to have these resources serve both Phases thereby reducing the technical support and management oversight costs for Phase 1.

**Cost Item Summary:** The verification of this staffing allocation will be reviewed in conjunction with the review of the staffing charts in the Project Management Plan. The PMOC's opinion is that the Program Management Support Services (PMSS) staff will increase for Phase 2 in lieu of having staff shift from Phase 1. Over the 5-year project duration of Phase 1, the PMOC provisionally supports a 20% reduction in Phase 1 PMSS staff to Phase 2 activities. The estimated value of the PMSS contract for Phase 1 is approximately \$92 million. A 20% reduction represents \$18.4 million, about \$19.0 million with contingencies. However since MWAA has not yet committed to a Phase 2 schedule, this reduction can not be realized at this time.

**Recommendation:** Given that MWAA has not committed to a schedule for Phase 2 of the project, the BCE reduction for PMSS Contract Adjustment cannot be recommended. The PMOC further recommends MWAA issue change orders to the PMSS contract to document this action prior to FTA approval into Final Design. The PMOC supports \$0 as the BCE value of cost savings for Item 1.19 at this time.

### **Recommendation for Baseline Cost Estimate Adjustment**

This section describes the development of the estimated BCE adjustment for the Cost Mitigation Items and summarizes recommendations for Baseline Cost Estimate adjustments.

In the section above, a recommendation for the Baseline Cost Estimate is provided. This BCE was typically estimated by a comparison and evaluation of base year direct construction costs. A pro-forma, developed by the PMOC, was used to estimate other costs. These estimated costs were escalated to estimate the adjustment required in the Baseline Cost Estimate.

The following subsections describe the method of pro-forma calculation and the method of escalation. A summary of the recommended BCE adjustment completes the section.

### **Pro-Forma Calculation of Other Costs**

In order to calculate the other costs attributable to each Cost Mitigation Item a pro-forma calculation was developed to estimate these costs from the differences found in the direct construction costs. The pro-forma used was modeled after the pro-forma used by MWAA in

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY



January 28, 2008

Mr. Vinton J. Rathburn  
Jacobs Carter Burgess  
2231 Crystal Drive, Suite 300  
Arlington, VA 22202

Subject: Metropolitan Washington Airports Authority Solicitation No. 8-07-C001, entitled  
"Program Management Support Services (PMSS) for Planning, Design and  
Construction of Dulles Rail"

Mr. Rathburn:

Thank you for your demonstrated willingness to share in the owner/agency cost mitigation initiative to further our efforts to have the Dulles Corridor Metrorail Project achieve the Cost Effectiveness value index necessary to secure the FTA's approval to enter Final Design. Based upon the evaluation of all the cost reduction opportunities shared by WMATA and MWAA, the Authority is assigning a limiting, Not-to-Exceed value of \$75.5M for the five (5) year Project Management Support Services Contract for Phase 1 of the Project. Consistent with this value, please continue with a staffing plan approach that allows for the manpower level necessary to meet the needs of the Phase 1 effort throughout its final design and construction duration. Periodic updates of the contract value for the PMSS labor and other direct costs, based on adjusting staffing levels and cost-to-complete analyses, should still be reviewed by MWAA's Project Director and Contracting Officer's Technical Representative at each Task Order renewal period.

If you have any questions regarding this letter or its enclosure, please contact the undersigned on 703-417-8679.

Sincerely,

Eric R. Carey  
Contracting Officer

Please signify your agreement with the terms hereof:

  
\_\_\_\_\_  
Jacobs Carter Burgess

cc: Frank D. Holly, Jr. MWAA  
Charles S. Carnaggio, P.E., MWAA  
Dennis Dayton, MWAA

## **Cost Item 3B: \$9.0 Million Reduction**

This item provides additional information in support of the cost mitigation initiatives related to the improvements on the Dulles International Airport Access Highway (DIAAH) that are not eligible for this Federal Project. Included are:

- Cost Mitigation Summary Status table with the highlighted cost mitigation values related to the DIAAH crossover and 3<sup>rd</sup> lane costs.
- Excerpts from the October 2007 FTA Internal Pre-Decisional Document.
- PMOC Cost Reductions as Adjusted by PMSS.
- Concurrent Non-Project Cost Summary with costs related to the DIAAH crossover and 3<sup>rd</sup> lane scope highlighted.
- Cost estimating worksheets for the roadway crossovers.
- Cost estimating worksheets for the 3<sup>rd</sup> lane alignment.

The documents in this item provide a detailed basis for the costs associated with these improvements to the DIAAH that are not directly related to the functionality of the rail transit system.

COST MITIGATION STATUS SUMMARY

(38)

Item No.	DESCRIPTION	YOES X 1,000,000			YOES X 1,000,000			YOES X 1,000,000							NOTES	
		CURRENT BUDGET ESTIMATES			BUDGET - FFP vs. ALLOWANCES			CONFIRMED CHANGES								
		Not Federal Project Eligible	Technology/Ops Change	VE/Scope	FFP per PMOC (with Contingency)	Allowance/Other per PMOC (with Contingency)	Total (with Contingency)	FFP			Allowance per PMOC		Owner-Agency			Total
								Negotiated Scope Change	Not Federal Project Eligible per PMOC	Owner's Contingency	Scope Change	Not Federal Project Eligible	Owner-Agency Cost per PMOC	Owner's Contingency		
1.1	Optimize Improvements in West Falls Church Yard			\$ (27.9)	\$ (3.5)	\$ (24.4)	\$ (27.9)	\$ 0.5		\$ 0.1	\$ (20.0)		\$ (1.5)	\$ (2.9)	\$ (23.8)	FFP and Allowance Change Order Executed. Owner Agency savings are T&M work for deleted scope.
1.2	Route 7 Enhancements	\$ (99.0)			\$ (4.2)	\$ (94.7)	\$ (99.0)		\$ (3.7)	\$ (0.5)		\$ (11.7)	\$ (73.8)	\$ (9.3)	\$ (99.0)	Approved by FTA as Not Federal Project Eligible
1.3	Spring Hill Road Improvements	\$ (1.4)			\$ (0.2)	\$ (1.2)	\$ (1.4)		\$ (0.1)	\$ (0.0)		\$ (0.5)	\$ (0.6)	\$ (0.1)	\$ (1.4)	
1.4	Wiehle Avenue Garage built by Developer	\$ -			\$ -		\$ -	\$ -		\$ -		\$ -			\$ -	No credit to be taken until Fairfax County reaches agreement with Developer.
1.5	Wiehle Avenue Bus Bays			\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -				\$ -	Remains in Project Scope.
1.6	Increase Min ATC design Headway & reduce Traction Power Requirements		\$ (13.0)		\$ (2.0)	\$ (11.0)	\$ (13.0)	\$ (2.0)		\$ (0.3)	\$ (9.6)			\$ (1.4)	\$ (13.3)	FFP and Allowance Change Order Executed.
1.7a	Use prefabricated Traction power Substations		\$ (8.4)		\$ (3.0)	\$ (5.4)	\$ (8.4)	\$ (3.6)		\$ (0.5)	\$ (4.7)			\$ (0.7)	\$ (9.4)	FFP and Allowance Change Order Executed.
1.7b	Use prefabricated Prewired signal houses		In 1.7a			In 1.7a					In 1.7a					
1.8	Use Microprocessor based ATC system design instead of present Relay Logic and discrete wiring		\$ (2.5)		\$ (0.2)	\$ (2.3)	\$ (2.5)	\$ (0.2)		\$ (0.0)	\$ (2.0)			\$ (0.3)	\$ (2.5)	FFP and Allowance Change Order Executed.
1.9	Use LAN/WAN TCP/IP communications system instead of present DTS technologies.		\$ -		\$ -	\$ -	\$ -	\$ 0.3		\$ 0.0	\$ -			\$ (0.0)	\$ 0.4	FFP and Allowance Change Order Executed.
1.10	Separate non-ATC communication systems from the ATC system		\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -			\$ -	\$ -	FFP and Allowance Change Order Executed.
1.11	Eliminate provisions for the future station at Wolf Trap			\$ (4.7)	\$ (4.7)	\$ -	\$ (4.7)	\$ (6.0)		\$ (0.9)	\$ -			\$ -	\$ (6.9)	FFP Change Order Executed.
1.12	Non-Recurring Rolling Stock Cost Allocation & Phasing	\$ (31.3)			\$ -	\$ (31.3)	\$ (31.3)						\$ (29.0)	\$ (2.2)	\$ (31.3)	WMATA has accepted the mitigations as mutually acceptable strategies as described in Mr. Catoe's letter to Mr. Bennett of September 6, 2007.
1.13	Reduce the number of maintenance vehicles and equipment			\$ (2.1)	\$ -	\$ (2.1)	\$ (2.1)						\$ (2.0)	\$ (0.1)	\$ (2.1)	
1.14	Use existing parking lots during construction of the Wiehle Avenue garage rather than building additional spaces.			\$ (2.0)	\$ (0.3)	\$ (1.7)	\$ (2.0)	\$ -		\$ -	\$ (1.6)			\$ (0.2)	\$ (1.8)	Allowance Change Order Executed.
1.15	Realignment to accommodate future 3rd lane widening	\$ (5.0)			\$ (1.2)	\$ (3.8)	\$ (5.0)	\$ (1.1)		\$ (0.2)	\$ (3.3)			\$ (0.5)	\$ (5.0)	MWAA has committed funding for these improvements from outside the Project
1.16	Implementation of revisions to stations		\$ (18.1)		\$ (3.1)	\$ (15.0)	\$ (18.1)	\$ 1.4		\$ 0.2	\$ (13.1)			\$ (1.9)	\$ (13.4)	FFP and Allowance Change Order Executed.
1.17	Platform Canopy length adjustment		\$ (8.5)		\$ (1.2)	\$ (7.3)	\$ (8.5)	\$ (0.4)		\$ (0.1)	\$ (6.4)			\$ (0.9)	\$ (7.7)	FFP and Allowance Change Order Executed.
1.18	Emergency Crossovers on the DIAAH	\$ (5.3)			\$ (1.3)	\$ (4.0)	\$ (5.3)	\$ (1.1)		\$ (0.2)	\$ (3.5)			\$ (0.5)	\$ (5.3)	MWAA has committed funding for these improvements from outside the Project
1.19	PMSS Contract adjustment			\$ (19.6)	\$ -	\$ (19.6)	\$ (19.6)						\$ (19.1)	\$ (0.6)	\$ (19.6)	MWAA and PMSS have agreed to an overall Phase 1 budget including this reduction.
TOTALS		\$ (141.9)	\$ (23.9)	\$ (82.9)	\$ (24.9)	\$ (223.7)		\$ (10.0)	\$ (6.0)	\$ (2.4)	\$ (97.4)	\$ (19.0)	\$ (126.1)	\$ (21.5)		
GRAND TOTAL		\$		\$ (248.6)	\$	\$ (248.6)	\$	\$	\$	\$ (18.4)	\$	\$	\$ (224.0)	\$	\$ (242.3)	

\$9.0M

PMOC Cost Reductions as Adjusted by PMSS

Eliminate realignment to accommodate future 3rd lane widening

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA	SCC Code	FFP	Allow	T&M	Real Est.	WMATA	Allocated OH	SCC Amount	Allocated Contingen cy	Unallocated contingency	Total Base Year	SCC Code
Roadway Civil Systems		\$2,000				40.07	\$ -	\$1,500				\$295	\$1,795	\$203		\$1,998	40.07
		\$550				50.04		\$550				\$108	\$658	\$74		\$732	50.04
						40.08		\$300				\$59	\$359	\$41		\$400	40.08
						40.05		\$200				\$39	\$239	\$27		\$266	40.05
<b>Subtotal</b>		\$0		\$0	\$0												
Subtotal Direct Costs	FFP Recovery 100%	\$0	\$2,550	\$0	\$0												
Engineering Costs						80.02	\$0	\$0				\$0	\$0	\$0		\$0	80.02
Additional Redesign						80.02	\$340	\$0				\$67	\$406	\$46		\$452	80.02
FD & CM/PM	29.6%	\$755	\$0			80.04	\$415	\$0				\$82	\$497	\$56		\$553	80.04
						80.02			\$0			\$0	\$0	\$0		\$0	80.02
						80.04			\$0			\$0	\$0	\$0		\$0	80.04
Subtotal Engineering Effort		\$755	\$0					\$3,305	\$0			\$649	\$3,954	\$447			
Engineering Reduction (Recovery)	100.0%	\$755	\$0														
Indirect Costs Reduction	8.8%	\$115						\$2,550									
Contingency Reduction	20.0%	\$23															
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$236	\$0													
Overhead Recovery	100.0%	\$138	\$236	\$0													
Fee	7.5%	\$67	\$209	\$0			\$205	\$445	\$0			\$649	\$0				
Cost Reduction		\$959	\$2,995	\$0	\$0				\$649								
Allocated Contingency %	11.3%	11.3%	11.3%	2.4%	11.3%												
Allocated Contingency		\$108	\$338	\$0	\$0		\$108	\$338	\$0	\$0				\$447			
Unallocated Contingency	3.3%	\$32	\$99	\$0	\$0		\$32	\$99	\$0	\$0					\$130	\$130	Unallocated
<b>Total Contingencies</b>		\$140	\$437	\$0	\$0												
<b>Total Cost</b>		\$1,100	\$3,432	\$0	\$0												
<b>Total Project Cost</b>				\$4,532													
Consolidated escalation	9.61%		BCE	\$4,967													
Disag. Escalation without contingency		\$70	\$317														
<b>YOE Total without Contingency</b>		\$1,029	\$3,312														

Allowances	Escalation	YOE
Trackwork	\$ -	\$ -
Wiehle Parking Garage	\$ -	\$ -
Station Finishes and MEP	\$ -	\$ -
WCFY Sound Box and Platforms	\$ -	\$ -
Pedestrian Bridges	\$ -	\$ -
Site Development	\$2,349	\$ 248
Installation of Public Art	\$ -	\$ -
Communications and Security	\$ -	\$ -
Fire Suppression	\$ -	\$ -
Elevators and Escalators	\$ -	\$ -
Spare parts	\$ -	\$ -
WCFY S&I Building	\$ -	\$ -
Traction Power Supply	\$646	\$ 68
ATC Supply	\$ -	\$ 714
Cathodic Protection and Corosion Control System	\$ -	\$ -
Contact Rail and Hardware Supply	\$ -	\$ -
Wiehle Avenue Replacement Parking	\$ -	\$ -
<b>Total</b>	<b>\$ 2,995</b>	<b>\$ 317</b>

PMOOC Cost Reductions as Adjusted by PMSS

Emergency crossovers on the DIAAH

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA	SCC Code	FFP	Allow	T&M	Real Est.	WMATA	Allocated OH	SCC Amount	Allocated Contingency	Unallocated contingency	Total Base Year	SCC Code
X-over under Aerial Guideway		\$48				40.07	\$ -	\$2,032				\$399	\$2,431	\$275		\$2,706	40.07
X-over gates between DIAAH & DTR		\$1,530				40.08		\$406				\$0	\$0	\$0	\$0	\$0	
X-over ramps @ Beulah Bridge		\$1,131				40.05		\$271				\$53	\$324	\$37	\$361	\$361	40.05
<b>Subtotal</b>		<b>\$0</b>															
<b>Subtotal Direct Costs</b>	<b>FFP Recovery</b>	<b>100%</b>															
Engineering Costs						80.02	\$0	\$0				\$0	\$0	\$0		\$0	80.02
Additional Redesign						80.02	\$361	\$0				\$71	\$432	\$49		\$481	80.02
FD & CM/PM	29.6%					80.04	\$441	\$0				\$87	\$528	\$60		\$587	80.04
						80.02			\$0				\$0	\$0		\$0	80.02
						80.04			\$0				\$0	\$0		\$0	80.04
								\$3,511	\$0			\$690	\$4,201	\$475			
Subtotal Engineering Effort																	
Engineering Reduction (Recovery)	100.0%																
Indirect Costs Reduction	6.8%																
Contingency Reduction	20.0%																
WC/GL, Builder's Risk, BPOL	9.3%																
Overhead Recovery	100.0%																
Fee	7.5%						\$217	\$473	\$0			\$690	\$0				
Cost Reduction									\$690								
Allocated Contingency %																	
Allocated Contingency							\$115	\$360	\$0	\$0				\$475			
Unallocated Contingency	3.3%						\$34	\$105	\$0	\$0						\$139	Unallocated
Total Contingencies																	\$4,814
Total Cost																	
<b>Total Project Cost</b>																	
Consolidated escalation	9.61%																
Disag. Escalation without contingency																	
YOE Total without Contingency																	

Allowances	Escalation	YOE
Trackwork	\$ -	\$ -
Wiehle Parking Garage	\$ -	\$ -
Station Finishes and MEP	\$ -	\$ -
WCFY Sound Box and Platforms	\$ -	\$ -
Pedestrian Bridges	\$ -	\$ -
Site Development	\$3,182	\$337
Installation of Public Art	\$ -	\$ -
Communications and Security	\$ -	\$ -
Fire Suppression	\$ -	\$ -
Elevators and Escalators	\$ -	\$ -
Spare parts	\$ -	\$ -
WCFY S&I Building	\$ -	\$ -
Traction Power Supply	\$ -	\$ -
ATC Supply	\$ -	\$ -
Cathodic Protection and Corosion Control System	\$ -	\$ -
Contact Rail and Hardware Supply	\$ -	\$ -
Wiehle Avenue Replacement Parking	\$ -	\$ -
<b>Total</b>	<b>\$3,182</b>	<b>\$337</b>

## FTA Internal Pre-Decisional Document

### Item 1.15 Eliminate realignment to accommodate future 3<sup>rd</sup> lane widening

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$4.329 million

**Description of Change:** The track alignment shown in the preliminary engineering drawings accommodates a future third lane for the DIAAH. The accommodations made to achieve this alignment are beyond what is necessary for the rapid transit system.

**Cost Item Summary:** The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$2.55 million for direct construction cost. Since this cost mitigation item is classified as the cost effectiveness exclusion, the pro-forma used should reflect the fully allocated design-build contractor costs.

**Recommendation:** The PMOC supports \$4.967 million as the BCE value of cost savings for Item 1.15.

### Item 1.16 Implementation of Revisions to Stations

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$16.409 million

**Description of Change:** This item includes several proposals for a more cost effective station design while still maintaining the functionality of the stations. Among the items included are the use of pre-cast cladding elements, replacement of selected brick/block walls with a textured pre-cast system, refinement of platform, mezzanine, pedestrian bridge and bus shelter canopy shapes, and revisions to stainless material at curtain wall & rail, decorative lighting, floor finishes and roofing systems.

**Cost Item Summary:** The cost savings presented for this item are shown as net cost reductions in each construction specification division based on a review of the existing architectural designs by DTP and MWAA. The items listed for cost reduction have been noted as having room for cost reduction without unacceptable reduction in quality. Although the amount of the proposed savings is significant, it is relatively low when considered as a percentage of the overall cost of the Stations. As such it seems reasonable and achievable.

**Recommendation:** The PMOC supports \$18.026 million as the BCE value of cost savings for Item 1.16.

## FTA Internal Pre-Decisional Document

### Item 1.17 Platform Canopy Length Adjustment

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$8.658 million

**Description of Change:** This change is to reduce the platform canopy length to typical WMATA Metrorail platform coverage. The reduction is 200 to 300 feet at most stations.

**Cost Item Summary:** The costs included in this item were taken from the previously priced Open Item to increase the canopy length beyond what was in the original 100% Preliminary Engineering documents. From a construction viewpoint, this is entirely a Scope Reduction rather than a VE reduction in that less canopy will be built. The value suggested for this seems reasonable and achievable. The cost used is the cost included in the Allowance Item in the Design-Build contract for Station Finishes. The engineering costs associated with this change are minor, but since they are included in the FFP, recovery of this amount and any other associated costs is subject to negotiation.

**Recommendation:** The PMOC supports \$8.433 million as the BCE value of cost savings for Item 1.17.

### Item 1.18 Emergency Crossovers on the DIAAH

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$5.191 million

**Description of Change:** The primary purpose of these improvements is to facilitate emergency vehicle access between the Dulles Toll Road and the DIAAH. This work is to support the Dulles Toll Road and the DIAAH and will be funded by MWAA as a Dulles Toll Road Improvement. It is not needed to provide rapid transit services.

**Cost Item Summary:** The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$2.71 million for direct construction cost, which reflects the deletion of costs associated with one crossover now carried under the Wolf Trap Station deletion, Item 1.11. Since this cost mitigation item is classified as the cost effectiveness exclusion, the pro-forma used should reflect the fully allocated design-build contractor costs.

**Recommendation:** The PMOC supports \$5.277 million as the BCE value of cost savings for Item 1.18.

### **Cost Item 3C: \$1.5 Million Reduction**

This item provides additional information in support of the cost mitigation initiatives related to the reduction in scope of utility relocation work related to the enlargement of WMATA's West Falls Church (WFC) maintenance facility.

Included are:

- Cost Mitigation Summary Status table with the highlighted cost mitigation values related to the WFC facilities.
- Excerpts from the October 2007 FTA Internal Pre-Decisional Document
- PMOC Cost Reductions as Adjusted by PMSS.
- Cost estimating worksheets for the utility relocations.

The scope related to the relocate these utilities has been reduced by the WMATA-proposed changes to the WFC yard and maintenance facility improvements to accommodate additional railcars.

COST MITIGATION STATUS SUMMARY

30

Item No.	DESCRIPTION	YOES X 1,000,000			YOES X 1,000,000			YOES X 1,000,000							NOTES	
		CURRENT BUDGET ESTIMATES			BUDGET - FFP vs. ALLOWANCES			CONFIRMED CHANGES								
		Not Federal Project Eligible	Technology/Ops Change	VE/Scope	FFP per PMOC (with Contingency)	Allowance/Other per PMOC (with Contingency)	Total (with Contingency)	FFP			Allowance per PMOC		Owner-Agency			Total
								Negotiated Scope Change	Not Federal Project Eligible per PMOC	Owner's Contingency	Scope Change	Not Federal Project Eligible	Owner-Agency Cost per PMOC	Owner's Contingency		
1.1	Optimize Improvements in West Falls Church Yard			\$ (27.9)	\$ (3.5)	\$ (24.4)	\$ (27.9)	\$ 0.5		\$ 0.1	\$ (20.0)		\$ (1.5)	\$ (2.9)	\$ (23.8)	FFP and Allowance Change Order Executed. Owner Agency savings are T&M work for deleted scope.
1.2	Route 7 Enhancements	\$ (99.0)			\$ (4.2)	\$ (94.7)	\$ (99.0)		\$ (3.7)	\$ (0.5)		\$ (11.7)	\$ (73.8)	\$ (9.3)	\$ (99.0)	Approved by FTA as Not Federal Project Eligible
1.3	Spring Hill Road Improvements	\$ (1.4)			\$ (0.2)	\$ (1.2)	\$ (1.4)		\$ (0.1)	\$ (0.0)		\$ (0.5)	\$ (0.6)	\$ (0.1)	\$ (1.4)	
1.4	Wiehle Avenue Garage built by Developer	\$ -			\$ -	\$ -	\$ -	\$ -		\$ -		\$ -			\$ -	No credit to be taken until Fairfax County reaches agreement with Developer.
1.5	Wiehle Avenue Bus Bays			\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -				\$ -	Remains in Project Scope.
1.6	Increase Min ATC design Headway & reduce Traction Power Requirements		\$ (13.0)		\$ (2.0)	\$ (11.0)	\$ (13.0)	\$ (2.0)		\$ (0.3)	\$ (9.6)			\$ (1.4)	\$ (13.3)	FFP and Allowance Change Order Executed.
1.7a	Use prefabricated Traction power Substations		\$ (8.4)		\$ (3.0)	\$ (5.4)	\$ (8.4)	\$ (3.6)		\$ (0.5)	\$ (4.7)			\$ (0.7)	\$ (9.4)	FFP and Allowance Change Order Executed.
1.7b	Use prefabricated Prewired signal houses		In 1.7a			In 1.7a					In 1.7a					
1.8	Use Microprocessor based ATC system design instead of present Relay Logic and discrete wiring		\$ (2.5)		\$ (0.2)	\$ (2.3)	\$ (2.5)	\$ (0.2)		\$ (0.0)	\$ (2.0)			\$ (0.3)	\$ (2.5)	FFP and Allowance Change Order Executed.
1.9	Use LAN/WAN TCP/IP communications system instead of present DTS technologies.		\$ -		\$ -	\$ -	\$ -	\$ 0.3		\$ 0.0	\$ -			\$ (0.0)	\$ 0.4	FFP and Allowance Change Order Executed.
1.10	Separate non-ATC communication systems from the ATC system		\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -			\$ -	\$ -	FFP and Allowance Change Order Executed.
1.11	Eliminate provisions for the future station at Wolf Trap			\$ (4.7)	\$ (4.7)	\$ -	\$ (4.7)	\$ (6.0)		\$ (0.9)	\$ -			\$ -	\$ (6.9)	FFP Change Order Executed.
1.12	Non-Recurring Rolling Stock Cost Allocation & Phasing	\$ (31.3)			\$ -	\$ (31.3)	\$ (31.3)						\$ (29.0)	\$ (2.2)	\$ (31.3)	WMATA has accepted the mitigations as mutually acceptable strategies as described in Mr. Catoe's letter to Mr. Bennett of September 6, 2007.
1.13	Reduce the number of maintenance vehicles and equipment			\$ (2.1)	\$ -	\$ (2.1)	\$ (2.1)						\$ (2.0)	\$ (0.1)	\$ (2.1)	
1.14	Use existing parking lots during construction of the Wiehle Avenue garage rather than building additional spaces.			\$ (2.0)	\$ (0.3)	\$ (1.7)	\$ (2.0)	\$ -		\$ -	\$ (1.6)			\$ (0.2)	\$ (1.8)	Allowance Change Order Executed.
1.15	Realignment to accommodate future 3rd lane widening	\$ (5.0)			\$ (1.2)	\$ (3.8)	\$ (5.0)		\$ (1.1)	\$ (0.2)		\$ (3.3)		\$ (0.5)	\$ (5.0)	MWAA has committed funding for these improvements from outside the Project
1.16	Implementation of revisions to stations			\$ (18.1)	\$ (3.1)	\$ (15.0)	\$ (18.1)	\$ 1.4		\$ 0.2	\$ (13.1)			\$ (1.9)	\$ (13.4)	FFP and Allowance Change Order Executed.
1.17	Platform Canopy length adjustment			\$ (8.5)	\$ (1.2)	\$ (7.3)	\$ (8.5)	\$ (0.4)		\$ (0.1)	\$ (6.4)			\$ (0.9)	\$ (7.7)	FFP and Allowance Change Order Executed.
1.18	Emergency Crossovers on the DIAAH	\$ (5.3)			\$ (1.3)	\$ (4.0)	\$ (5.3)		\$ (1.1)	\$ (0.2)		\$ (3.5)		\$ (0.5)	\$ (5.3)	MWAA has committed funding for these improvements from outside the Project
1.19	PMSS Contract adjustment			\$ (19.6)	\$ -	\$ (19.6)	\$ (19.6)						\$ (19.1)	\$ (0.6)	\$ (19.6)	MWAA and PMSS have agreed to an overall Phase 1 budget including this reduction.
TOTALS		\$ (141.9)	\$ (23.9)	\$ (82.9)	\$ (24.9)	\$ (223.7)		\$ (10.0)	\$ (6.0)	\$ (2.4)	\$ (57.4)	\$ (19.0)	\$ (126.1)	\$ (21.5)		
GRAND TOTAL		\$		\$ (248.6)	\$	\$ (248.6)	\$	\$	\$ (18.4)	\$	\$	\$	\$ (224.0)	\$	\$ (242.3)	

PMOC Cost Reductions as Adjusted by PMSS

PMOC #3.4M for Wall incl. Utility Relocation

Optimize improvements in the West Falls Church Yard Option 1

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
Wall		\$2,386			
Utility Relocation			\$1,000		
Foundation	\$2,340				
equipment	\$4,000				
Road Modifications	\$810				
Track	\$1,990				
ATC & TP	\$4,495				

Subtotal Direct Costs	FFP Recovery	50%	Subtotal	\$0	Allowances	\$16,021	T&M	\$1,000	Real Est.	\$0	WMATA	\$0
Engineering Costs												
Additional Redesign												
FD & CM/PM	29.6%		\$4,742									
Subtotal Engineering Effort			\$4,092									
Engineering Reduction (Recovery)	50.0%		\$2,046									
Indirect Costs Reduction	6.8%		\$721									
Contingency Reduction	20.0%		\$144									
WC/GL, Builder's Risk, BPOL	9.3%		\$0		\$1,482		\$93					
Overhead Recovery	50.0%		\$433		\$741		\$161					
Fee	7.5%		\$186		\$1,313		\$101					
Cost Reduction			\$2,665		\$18,075		\$1,424		\$0	\$0		
Allocated Contingency %	11.3%		\$301		\$2,042		\$161		\$0	\$0		
Unallocated Contingency	3.3%		\$88		\$596		\$47		\$0	\$0		
Total Contingencies			\$389		\$2,639		\$208		\$0	\$0		
Total Cost			\$3,054		\$20,714		\$1,631		\$0	\$0		
Total Project Cost							\$25,399					
Consolidated escalation	9.61%				BCE		\$27,839					

SCC Code	FFP	Allow	T&M	Real Est.	WMATA	Allocated OH	SCC Amount	Allocated Contingency	Unallocated contingency	SCC Code
30.03	(\$56)	\$2,386				\$321	\$2,651	\$300		\$2,951 30.03
40.02		\$0	\$1,000			\$138	\$1,138	\$129		\$1,266 40.02
30.03	(\$75)	\$2,340				\$312	\$2,577	\$291		\$2,868 30.03
30.03		\$4,000				\$551	\$4,551	\$514		\$5,065 30.03
30.03	(\$20)	\$810				\$109	\$898	\$102		\$1,000 30.03
10.11		\$1,990				\$274	\$2,264	\$256		\$2,520 10.11
50.01		\$674				\$93	\$767	\$87		\$854 50.01
50.04		\$3,821				\$526	\$4,347	\$491		\$4,838 50.04
										\$0
										\$0
Directs	(\$152)	\$16,021	\$1,000				\$10,192			
80.02	(\$15)					(\$2)	(\$17)	(\$2)		(\$19) 80.02
80.02	(\$294)		\$162			(\$41)	(\$173)	(\$20)		(\$192) 80.02
80.04	\$0					\$0	\$0	\$0		\$0 80.04
EGR	(\$309)	\$16,560	\$162			\$2,280	\$19,003	\$2,147		
	\$0									
	(\$14)									
	(\$21)									
Overhead	(\$35)	\$2,054	\$262			\$2,280				
Sum	(\$496)		\$1,424							
	(\$56)	\$2,042	\$161					\$2,147		
	(\$16)	\$596	\$47						\$627	\$627 Unallocated
				\$0						\$21,777
Escalation	(\$25)	\$1,912	\$197							\$1,984
Total	(\$521)		\$1,521							\$23,761
	(\$593)		\$1,729							\$17,579
										\$20,354

Allowances	10.58%		Sub YOE
	Base Year	Escalation YOY	
Trackwork	\$ 2,245	\$ 238	\$ 2,483 \$ 1,990 \$ 2,201
Wiehle Parking Garage	\$ -	\$ -	\$ -
Station Finishes and MEP	\$ -	\$ -	\$ -
WCFY Sound Box and Platforms	\$ -	\$ -	\$ -
Pedestrian Bridges	\$ -	\$ -	\$ -
Site Development	\$ -	\$ -	\$ -
Installation of Public Art	\$ -	\$ -	\$ -
Communications and Security	\$ -	\$ -	\$ -
Fire Suppression	\$ -	\$ -	\$ -
Elevators and Escalators	\$ -	\$ -	\$ -
Spare parts	\$ -	\$ -	\$ -
WFCY S&I Building	\$ 10,758	\$ 1,138	\$ 11,897 \$9,536 \$ 10,545
Traction Power Supply	\$ 3,499	\$ 370	\$ 3,869 \$3,101.55 \$ 3,430
ATC Supply	\$ 1,217	\$ 129	\$ 1,346 \$1,078.80 \$ 1,193
Cathodic Protection and Corrosion Control System	\$ -	\$ -	\$ -
Contact Rail and Hardware Supply	\$ 355	\$ 38	\$ 393 \$314.65 \$ 348
Wiehle Avenue Replacement Parking	\$ -	\$ -	\$ -
	\$ 18,075	\$ 1,912	\$ 19,987
	\$ 20,714	\$ 1,912	\$ 22,626

## FTA Internal Pre-Decisional Document

### Review of Cost Mitigation Items

This section contains a description and commentary on each proposed Cost Mitigation Item. The MWAA Proposed Cost Reductions are shown in base year cost, not as BCE reductions. The PMOC recommendations are shown as BCE adjustments and have been calculated using the method described in the following section of this report.

#### Item 1.1 Optimize improvements in the West Falls Church Yard

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$27.047 million later revised to \$25.739 million.

**Description of Change:** The changes will consist of construction of a stand-alone maintenance shop in West Falls Church Yard, elimination of the large retaining wall adjacent to Interstate Route 66, retention of roadways in yard area, and avoidance of utility relocation. The stand-alone shop is proposed to utilize a portable jacking system rather than in-floor car hoists. The storage capacity being added to the yard is 34 cars, reduced from 54 cars. It is proposed that TPSS #1 be moved from the yard to the Dulles Corridor alignment.

**Cost Item Summary:** The Supplemental Engineering, which detailed the expansion of West Falls Church Shop, included a cost estimate with \$31.6 million in direct construction costs. In addition there was a need to add two tracks, including signals and traction power, to the yard. MWAA has suggested \$15.8 million in direct cost reductions.

The PMOC has reviewed the estimate prepared for the Supplemental Engineering. The proposed stand-alone building is similar in size to the proposed building expansion for the West Falls Church Shop. However, avoidance of relocating the loading dock at the shop and deletion of the in-floor jacks has reduced the foundation costs about \$2.3 million. The provision of portable jacking systems in lieu of car hoists and turntables saves \$4.0 million in equipment costs. The cost of the retaining wall was estimated at \$3.4 million. Deletion of trackwork, signals, and traction power is an additional \$6.4 million reduction in direct costs. The construction at West Falls Church Shop is priced in Allowance Items for Site Development, Train Control, Traction Power, and the West Falls Church Shop line item.

It should be noted that the proposed changes in scope at West Falls Church Shop and Yard are conceptual. It may take up to 2 months for the work at this site to be brought to the 100% PE level and to develop a detailed cost estimate.

**Recommendation:** The PMOC supports \$27.704 million as the BCE value of cost savings for Option 1 Item 1.1a.

Based on \$2.4 M for wall and \$1.0M for Utility Relocation associated with the wall.

Utility Relocation Cost Estimate - South of S. I. Shop Building (Expansion and Retaining Wall)

Utility	Measured Linear Feet	Assumed Add'l. Linear Feet	In Conflicts List? Dated 20-Jul-07	Total LF	STV March Estimate	Unit Cost from Cost
8" SANITARY	[REDACTED]	[REDACTED]	yes	[REDACTED]	[REDACTED]	[REDACTED]
12" WATER	[REDACTED]	[REDACTED]	no	[REDACTED]	[REDACTED]	[REDACTED]
8" WATER	[REDACTED]	[REDACTED]	yes	[REDACTED]	[REDACTED]	[REDACTED]
34.5 ELEC.	[REDACTED]	[REDACTED]	yes	[REDACTED]	[REDACTED]	[REDACTED]

\*\*48", 42", and 30" sanitary in the area assumed to be deep enough to avoid conflict.

**TOTAL COST** \$ 1,055,147.63

HARD

These redactions are necessary to protect the financial interests of the Airports Authority and Commonwealth of Virginia as well as those of Fairfax and Loudon Counties as local funding partners. The redactions are only in sections that address estimated amounts for individual allowances that could affect bidding strategies of future competitors, insurance cost information, or other information that allows computation of pricing information that is confidential.

DIRECT COST REPORT

Activity Resource	Desc	Pcs	Quantity	Unit	Unit Cost	Labor	Peru Material	Constr Material	Equip-Ment	Sub-Contract	Total
BID ITEM = 150	Description = Horizontal drilling			Unit = LF		Takeoff Quan:			Engr Quan:		
202500.FILL	Fill for Util Reloc			CY							
402315.05	Haul to Landfill			CY							
8.11.401	Loader/Backhoe,1CY, Ca			HR							
LB02	Laborers (Bldg) FM			MH							
LB03	Laborers (Bldg) JM			MH							
OE06	Oper Engr-Grp3Loader>4C			MH							
	MH/EA			MH							
Item Totals: - Horizontal drilling											

These redactions are necessary to protect the financial interests of the Airports Authority and Commonwealth of Virginia as well as those of Fairfax and Loudon Counties as local funding partners. The redactions are only in sections that address estimated amounts for individual allowances that could affect bidding strategies of future competitors, insurance cost information, or other information that allows computation of pricing information that is confidential.

PARENT ITEM = 200	Description = GAS MAIN RELOCATION			Unit = LF		Takeoff Quan:			Engr Quan:		
Listing of Sub-Biditems of Parent Item 200:											

BID ITEM = 210	Description = GAS MAIN RELOCATION UP TO 80 FT			Unit = LF		Takeoff Quan:			Engr Quan:	
0263.015	Gas main relocation			Quan:				Cal: 99	WC: VA0000	
EP30IN	Install Pipe - 10 30 in			Prod:						
202060.OS1	Pipe Bedding Sand									
202500.FILL	Fill for Util Reloc									
202630	Piping material									
402315.05	Haul to Landfill									
8.11.401	Loader/Backhoe,1CY, Ca									
8.11.950	Truck, OffRd Dump, 30c									
8.13.011	Compactor Hand Vibrato									
LB05	Laborers (H/H) FM									
LB06	Laborers (H/H) JM									
OE05	Oper Engr-Grp2 Finish Bla									
PF02	Pipefitters FM									
PF03	Pipefitters JM									
TM08	Teamster Grp5-Dump >65C									
0276.0710	Striping - 4"			Quan:		LF		Cal: 99	WC: VA0000	
R3L1F	Striping			CH		Prod:		Lab Pcs:	Eqp Pcs:	
202766.TH04	Thermo. Striping 4"			LF						
8.03.512	Truck, Flatbed, 12tn			HR						
8.10.901	Striping Machine Self-			HR						
LB05	Laborers (H/H) FM			MH						
LB06	Laborers (H/H) JM			MH						
TM07	Teamster Grp4-Water Pull			MH						

DIRECT COST REPORT

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Material	Equip-Ment	Sub-Contract	Total
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**BID ITEM = 370**  
 Description = Valves Unit = EA Takeoff Quan: [REDACTED] Engr Quan: [REDACTED]  
 OE05 Oper Engr-Grp2 Finish Bla [REDACTED] [REDACTED] [REDACTED]  
 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]  
 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]  
 ==> Item Totals: 370 - Valves [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

**BID ITEM = 380**  
 Description = Structure demolition Unit = EA Takeoff Quan: 8.000 Engr Quan: 0.000  
 02100 Demolition Quan: 8.00 EA Hrs/Shift: 8.00 Cal: TU1 WC: VA0000  
 DILIF1 Demo Inlet/ Manhole 45.71 CH Prod: 5.7138 HU Lab Pcs: 7.00 Eqp Pcs: 2.00  
 8.11.401 Loader/Backhoe,1CY, Ca [REDACTED] HR [REDACTED] [REDACTED] [REDACTED]  
 8.11.801 Hydraulic,Excav,1CY,Ca [REDACTED] HR [REDACTED] [REDACTED] [REDACTED]  
 LB05 Laborers (H/H) FM [REDACTED] MH [REDACTED] [REDACTED] [REDACTED]  
 LB06 Laborers (H/H) JM [REDACTED] MH [REDACTED] [REDACTED] [REDACTED]  
 OE06 Oper Engr-Grp3Loader>4C [REDACTED] MH [REDACTED] [REDACTED] [REDACTED]  
 TM08 Tearster Grp5-Dump >65C [REDACTED] MH [REDACTED] [REDACTED] [REDACTED]  
 [REDACTED] EA [REDACTED] MH [REDACTED] [REDACTED] [REDACTED]  
 ==> Item Totals: 380 - Structure demolition [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

**BID I** These redactions are necessary to protect the financial interests of the Airports Authority and  
 Descri Commonwealth of Virginia as well as those of Fairfax and Loudon Counties as local funding partners.  
 390A The redactions are only in sections that address estimated amounts for individual allowances that could  
 4MET affect bidding strategies of future competitors, insurance cost information, or other information that  
 allows computation of pricing information that is confidential.

Total of Above Sub-Biditems

==> Item Totals: 300 - WATERMAIN RELOCATION [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

**PARENT ITEM = 400**  
 Description = ELECTRIC RELOCATION Unit = LF Takeoff Quan: [REDACTED] Engr Quan: [REDACTED]

Listing of Sub-Biditems of Parent Item 400:

**BID ITEM = 410**  
 Description = ELECTRIC RELOCATION UP TO 80 FT Unit = LF Takeoff Quan: [REDACTED] Engr Quan: [REDACTED]

There are no activities in this biditem.

DIRECT COST REPORT

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip-ment	Sub-Contract	Total
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BID ITEM = 440  
Description = ELECTRIC RELOCATION ABOVE 300 FT Unit = LF Takeoff Quan: [REDACTED] Engr Quan: [REDACTED]

BID ITEM = 450  
Description = UTILITY POLES Unit = LS Takeoff Quan: [REDACTED] Engr Quan: [REDACTED]

450A	Remove utility poles								
E2EL2	Overhead Electrical								Cal: 99 WC: VA0000
8.03.200	Truck, Aerial Lift Buc		HR						
8.03.513	Truck Flatbed, 45,000l		HR						
8.14.506	Crane, Rough Terrain 1		HR						
EL02	Electrician -FM		MH						
EL03	Electrician -JM		MH						
OE05	Oper Engr-Grp2 Finish Bla		MH						
TM08	Teamster Grp5-Dump >65C		MH						
\$120,576.08									

450B	Proposed utility poles								
E2EL2	Overhead Electrical								Cal: 99 WC: VA0000
2UTPOLES	Utility poles		EA						
8.03.200	Truck, Aerial Lift Buc		HR						
8.03.513	Truck Flatbed, 45,000l		HR						
8.14.506	Crane, Rough Terrain 1		HR						
EL02	Electrician -FM		MH						
EL03	Electrician -JM		MH						
OE05	Oper Engr-Grp2 Finish Bla		MH						
TM08	Teamster Grp5-Dump >65C		MH						

Item Totals: [REDACTED] - UTILITY POLES

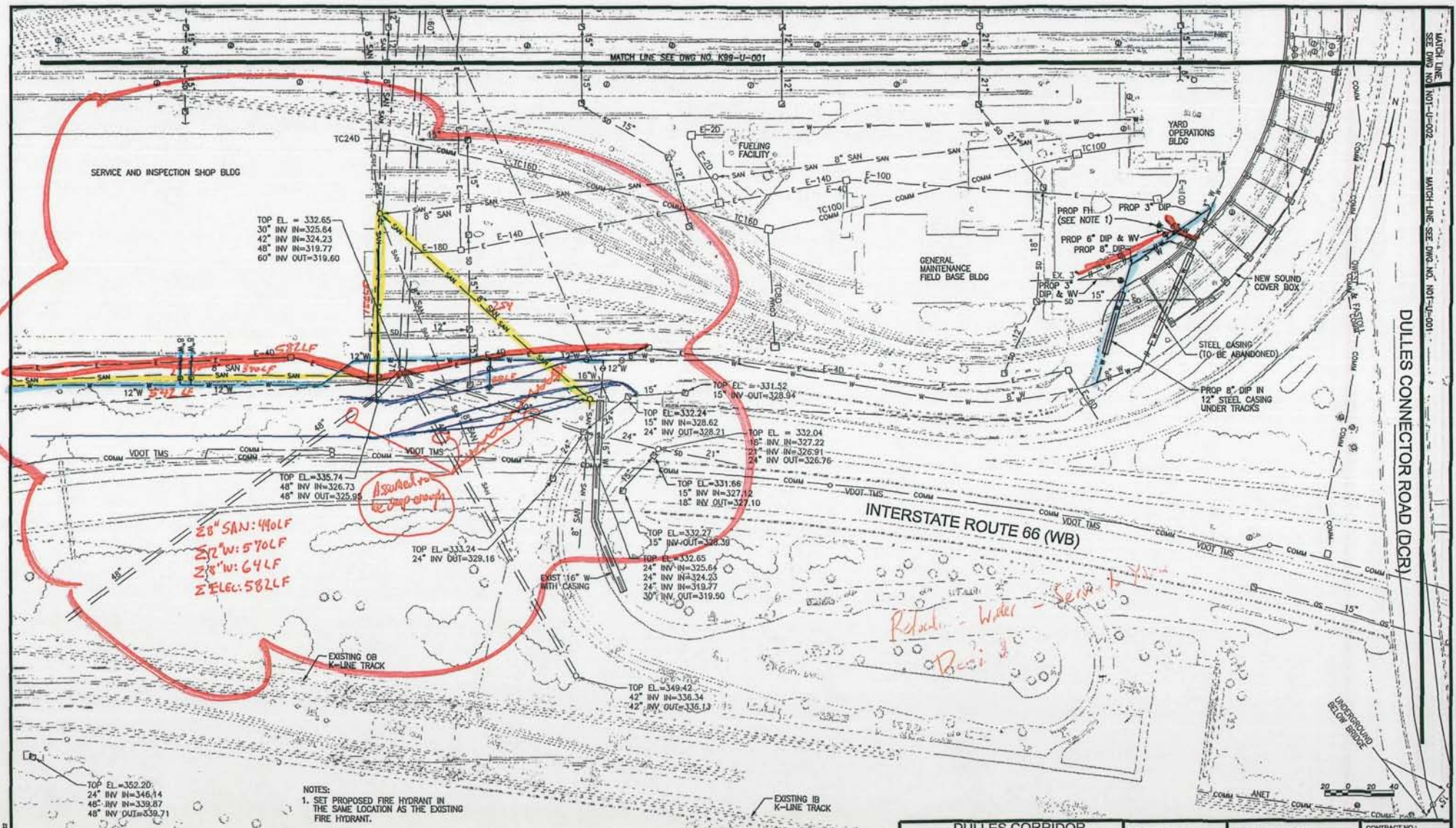
These redactions are necessary to protect the financial interests of the Airports Authority and Commonwealth of Virginia as well as those of Fairfax and Loudon Counties as local funding partners. The redactions are only in sections that address estimated amounts for individual allowances that could affect bidding strategies of future competitors, insurance cost information, or other information that allows computation of pricing information that is confidential.

PARENT ITEM = 500  
Description = TELEPHONE LINES RELOCATION Unit = LF Takeoff Quan: [REDACTED] Engr Quan: [REDACTED]

Listing of Sub-Biditems of Parent Item 500:

BID ITEM = 510  
Description = TELEPHONE LINES RELOCATION UP TO 80 FT Unit = LF Takeoff Quan: 0.000 Engr Quan: 0.000

There are no activities in this biditem.



REFERENCE DRAWINGS		REVISIONS			
NO.	DATE	DESCRIPTION	BY	CHKD	APPRD
A	9/7/05	80% DESIGN PACKAGE (DE 20011216)	MP	FM	JT
B	10/12/05	80% DESIGN PACKAGE	DT	FM	JT
C	11/4/05	85% DESIGN PACKAGE	DT	FM	JT
D	2/15/06	100% DESIGN PACKAGE	DT	FM	JT

NO.	DATE	DESCRIPTION
1.		SET PROPOSED FIRE HYDRANT IN THE SAME LOCATION AS THE EXISTING FIRE HYDRANT.

**DULLES CORRIDOR METRORAIL PROJECT**

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DULLES TRANSIT ENGINEERS

DB OPT

DRPT

Virginia Department of Rail and Public Transportation

CONTRACT NO.:

WMATA GRID: F.C. GRID 40-3

**EXTENSION TO WIEHLE AVE  
WEST FALLS CHURCH YARD  
COMPOSITE PLAN OF EXISTING & MODIFIED  
UTILITIES - SHEET 2**

DRAWING NO.:

K99-U-002

SCALE: 1"=40'

12/14/2008 2:27

## **Cost Item 4: \$90.4 Million Reduction**

This item provides additional information in support of the cost mitigation initiatives related to improvements to Route 7 and Spring Hill Road. Included are:

- Cost Mitigation Summary Status table with the highlighted cost mitigation values related to Route 7 and Spring Hill Road.
- Excerpts from the October 2007 FTA Internal Pre-Decisional Document.
- PMOC Cost Reductions as Adjusted by PMSS.

The documents in this item provide a detailed basis for the costs associated with the enhancement to Route 7 and improvements to Spring Hill Road that are not directly related to the functionality of the rail transit system. FTA has approved these costs as not being eligible for this Federal Project.

COST MITIGATION STATUS SUMMARY

4

Item No.	DESCRIPTION	YOES X 1,000,000			YOES X 1,000,000			YOES X 1,000,000						Total	NOTES	
		CURRENT BUDGET ESTIMATES			BUDGET - FFP vs. ALLOWANCES			CONFIRMED CHANGES								
		Not Federal Project Eligible	Technology/Ops Change	VE/Scope	FFP per PMOC (with Contingency)	Allowance/Other per PMOC (with Contingency)	Total (with Contingency)	FFP			Allowance per PMOC		Owner-Agency			
Negotiated Scope Change	Not Federal Project Eligible per PMOC							Owner's Contingency	Scope Change	Not Federal Project Eligible	Owner-Agency Cost per PMOC	Owner's Contingency				
1.1	Optimize Improvements in West Falls Church Yard			\$ (27.9)	\$ (3.5)	\$ (24.4)	\$ (27.9)	\$ 0.5		\$ 0.1	\$ (70.0)		\$ (1.5)	\$ (2.9)	\$ (23.8)	FFP and Allowance Change Order Executed. Owner Agency savings are T&M work for deleted scope.
1.2	Route 7 Enhancements	\$ (99.0)			\$ (4.2)	\$ (94.7)	\$ (99.0)		\$ (3.7)	\$ (0.5)		\$ (11.7)	\$ (73.8)	\$ (9.3)	\$ (99.0)	Approved by FTA as Not Federal Project Eligible
1.3	Spring Hill Road Improvements	\$ (1.4)			\$ (0.2)	\$ (1.2)	\$ (1.4)		\$ (0.1)	\$ (0.0)		\$ (0.5)	\$ (0.6)	\$ (0.1)	\$ (1.4)	
1.4	Wiehle Avenue Garage built by Developer	\$ -			\$ -	\$ -	\$ -	\$ -		\$ -		\$ -			\$ -	No credit to be taken until Fairfax County reaches agreement with Developer.
1.5	Wiehle Avenue Bus Bays			\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -				\$ -	Remains in Project Scope.
1.6	Increase Min ATC design Headway & reduce Traction Power Requirements		\$ (13.0)		\$ (2.0)	\$ (11.0)	\$ (13.0)	\$ (2.0)		\$ (0.3)	\$ (9.6)			\$ (1.4)	\$ (13.3)	FFP and Allowance Change Order Executed.
1.7a	Use prefabricated Traction power Substations		\$ (8.4)		\$ (3.0)	\$ (5.4)	\$ (8.4)	\$ (3.6)		\$ (0.5)	\$ (4.7)			\$ (0.7)	\$ (9.4)	FFP and Allowance Change Order Executed.
1.7b	Use prefabricated Prewired signal houses		In 1.7a			In 1.7a					In 1.7a					
1.8	Use Microprocessor based ATC system design instead of present Relay Logic and discrete wiring		\$ (2.5)		\$ (0.2)	\$ (2.3)	\$ (2.5)	\$ (0.2)		\$ (0.0)	\$ (2.0)			\$ (0.3)	\$ (2.5)	FFP and Allowance Change Order Executed.
1.9	Use LAN/WAN TCP/IP communications system instead of present DTS technologies.		\$ -		\$ -	\$ -	\$ -	\$ 0.3		\$ 0.0	\$ -			\$ (0.0)	\$ 0.4	FFP and Allowance Change Order Executed.
1.10	Separate non-ATC communication systems from the ATC system		\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -			\$ -	\$ -	FFP and Allowance Change Order Executed.
1.11	Eliminate provisions for the future station at Wolf Trap			\$ (4.7)	\$ (4.7)	\$ -	\$ (4.7)	\$ (6.0)		\$ (0.9)	\$ -			\$ -	\$ (6.9)	FFP Change Order Executed.
1.12	Non-Recurring Rolling Stock Cost Allocation & Phasing	\$ (31.3)			\$ -	\$ (31.3)	\$ (31.3)						\$ (29.0)	\$ (2.2)	\$ (31.3)	WMATA has accepted the mitigations as mutually acceptable strategies as described in Mr. Catoe's letter to Mr. Bennett of September 6, 2007.
1.13	Reduce the number of maintenance vehicles and equipment			\$ (2.1)	\$ -	\$ (2.1)	\$ (2.1)						\$ (2.0)	\$ (0.1)	\$ (2.1)	
1.14	Use existing parking lots during construction of the Wiehle Avenue garage rather than building additional spaces.			\$ (2.0)	\$ (0.3)	\$ (1.7)	\$ (2.0)	\$ -		\$ -	\$ (1.6)			\$ (0.2)	\$ (1.8)	Allowance Change Order Executed.
1.15	Realignment to accommodate future 3rd lane widening	\$ (5.0)			\$ (1.2)	\$ (3.8)	\$ (5.0)		\$ (1.1)	\$ (0.2)		\$ (3.3)		\$ (0.5)	\$ (5.0)	MWAA has committed funding for these improvements from outside the Project
1.16	Implementation of revisions to stations		\$ (18.1)		\$ (3.1)	\$ (15.0)	\$ (18.1)	\$ 1.4		\$ 0.2	\$ (13.1)			\$ (1.9)	\$ (13.4)	FFP and Allowance Change Order Executed.
1.17	Platform Canopy length adjustment		\$ (8.5)		\$ (1.2)	\$ (7.3)	\$ (8.5)	\$ (0.4)		\$ (0.1)	\$ (6.4)			\$ (0.9)	\$ (7.7)	FFP and Allowance Change Order Executed.
1.18	Emergency Crossovers on the DIAAH	\$ (5.3)			\$ (1.3)	\$ (4.0)	\$ (5.3)		\$ (1.1)	\$ (0.2)		\$ (3.5)		\$ (0.5)	\$ (5.3)	MWAA has committed funding for these improvements from outside the Project
1.19	PMSS Contract adjustment			\$ (19.6)	\$ -	\$ (19.6)	\$ (19.6)						\$ (19.1)	\$ (0.6)	\$ (19.6)	MWAA and PMSS have agreed to an overall Phase 1 budget including this reduction.
TOTALS		\$ (141.9)	\$ (23.9)	\$ (82.9)	\$ (24.9)	\$ (223.7)		\$ (10.0)	\$ (6.0)	\$ (2.4)	\$ (57.4)	\$ (19.0)	\$ (126.1)	\$ (21.5)		
GRAND TOTAL				\$ (248.6)		\$ (248.6)				\$ (18.4)				\$ (224.0)		\$ (242.3)

\$90.4M

PMOC Cost Reductions as Adjusted by PMSS

4

Route 7 enhancements

- Line Item Description
- Station facilities
- Street lighting
- Mid-block crossings
- Street Reconfiguration

SCC Code	Allocated OH	SCC Amount	Allocated Contingency	Unallocated Contingency	Total Base Year	SCC Code
40.06						40.06
40.06						40.06
40.06						40.06
40.07						40.07
40.05						40.05
40.01						40.01
40.08						40.08
40.02						40.02
60.01						60.01

SCC Code	Allow	T&M	Rail Est.	WMATA	FFP	FFP	SCC Code
40.08							40.08
40.06							40.06
40.06							40.06
40.07							40.07
40.05							40.05
40.01							40.01
40.06							40.06
40.02							40.02
60.01							60.01

\$19,530

\$35,300

Line Item Description	Subtotal	FFP Recovery	Subtotal	FFP	Allowances	T&M	Rail Est.	WMATA	FFP	FFP	SCC Code
Subtotal Direct Costs	\$0	100%	\$0	\$0							
Engineering Costs	\$0		\$0	\$0							
Additional Redesign	\$2,661	29.8%	\$788	\$1,873							
FD & CMPM (T&M at 16.2%)	\$0		\$0	\$0							
Subtotal Engineering Effort	\$2,661		\$788	\$1,873							
Engineering Reduction (Recovery)	\$2,661	100.0%	\$0	\$2,661							
Indirect Costs Reduction	\$405	6.8%	\$132	\$273							
Contingency Reduction	\$81	20.0%	\$16	\$65							
WC/GL, Builder's Risk, BPOL	\$0	8.3%	\$0	\$0							
Overhead Recovery	\$485	7.5%	\$145	\$340							
Fee	\$236		\$73	\$163							
Cost Reduction	\$3,382		\$1,056	\$2,326							
Allocated Contingency %	11.3%		11.3%	11.3%							
Allocated Contingency	\$382		\$119	\$263							
Unallocated Contingency	\$112		\$248	\$136							
Total Contingencies	\$494		\$1,541	\$1,047							
Total Project Cost	\$3,876		\$12,100	\$8,224							
Consolidated escalation	\$247	9.61%	\$1,117	\$1,364							
Disap. Escalation without contingency	\$2,599		\$3,712	\$1,113							
YOE Total without Contingency			\$11,675	\$11,675							
YOE Total			\$13,792	\$13,792							

Allowances	Base Year	Escalation	YOE
Trackwork	\$	10.58%	\$
Wiehle Parking Garage	\$		\$
Station Finishes and MEP	\$		\$
WCY Sound Box and Platforms	\$		\$
Pedestrian Bridges	\$		\$
Site Development	\$		\$
Installation of Public Art	\$		\$
Communications and Security	\$		\$
Fire Suppression	\$		\$
Elevators and Escalators	\$		\$
Spare parts	\$		\$
WCY S&I Building	\$		\$
Traction Power Supply	\$		\$
ATC Supply	\$		\$
Catenary Protection and Concession Control System	\$		\$
Contact Rail and Hardware Supply	\$		\$
Wiehle Avenue Replacement Paving	\$		\$
<b>Total</b>	<b>\$10,558</b>		<b>\$11,675</b>

These redactions are necessary to protect the financial interests of the Airports Authority and Commonwealth of Virginia as well as those of Fairfax and Loudon Counties as local funding partners. The redactions are only in sections that address estimated amounts for individual allowances that could affect bidding strategies of future competitors, insurance cost information, or other information that allows computation of pricing information that is confidential.

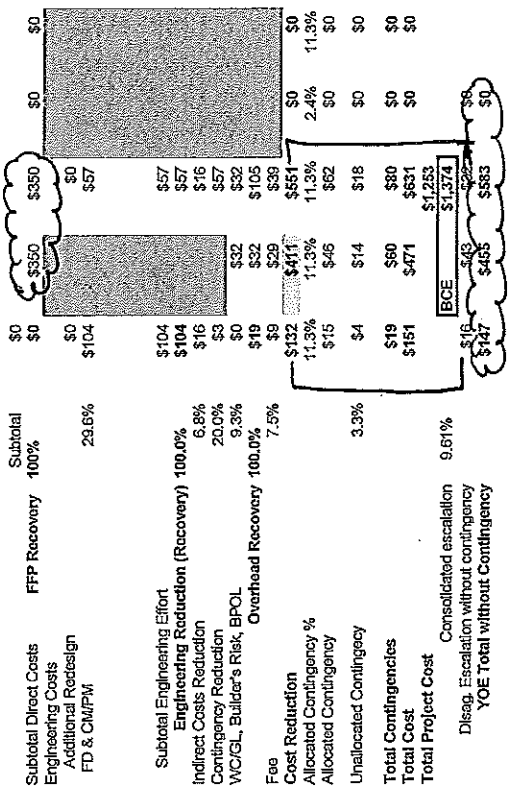
(4)

PMOC Cost Reductions as Adjusted by PMSS

Dulles Corridor Metrolink Project  
Extension to Wiehle Avenue

Spring Hill Road Improvements

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA	Allocated OH	Allocated Contingency	Unallocated Contingency	Total Base Year	SCC Code
Subtotal Direct Costs	\$0	\$350	\$0	\$0	\$0	\$193	\$893	\$110	\$0	80.02
Engineering Costs	\$0	\$0	\$0	\$0	\$0	\$9	\$56	\$6	\$62	80.02
Additional Redesign	\$104	\$57	\$0	\$0	\$0	\$11	\$68	\$8	\$76	80.04
FD & CMP/PM			\$26			\$9	\$35	\$0	\$35	80.02
Subtotal Engineering Effort	\$104	\$57	\$26	\$0	\$0	\$11	\$42	\$0	\$42	80.04
Engineering Reduction (Recovery)	100.0%					\$233	\$1,093	\$124	\$0	
Indirect Costs Reduction	6.8%								\$0	
Contingency Reduction	20.0%								\$0	
WC/GL, Builder's Risk, BPOL	9.3%								\$0	
Overhead Recovery	100.0%								\$0	
Fee	7.5%								\$0	
Cost Reduction									\$0	
Allocated Contingency %	11.3%								\$0	
Allocated Contingency	\$15								\$0	
Unallocated Contingency	\$4								\$0	
Total Contingencies	\$19								\$0	
Total Cost	\$151	\$671	\$18	\$0	\$0	\$124	\$36	\$36	\$1,253	
Total Project Cost	\$16	\$1,374	\$18	\$0	\$0	\$124	\$36	\$36	\$1,253	
Dissep. Escalation without contingency	\$16	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
YOE Total without Contingency	\$147	\$465	\$18	\$0	\$0	\$124	\$36	\$36	\$1,253	



Allowances	Escalation YOE
Trackwork	\$ - \$ -
Vehicle Parking Garage	\$ - \$ -
Station Finishes and MEP	\$ - \$ -
WC/FY Sound Box and Platforms	\$ - \$ -
Pedestrian Bridges	\$ - \$ -
Site Development	\$ - \$ -
Installation of Public Art	\$ 43 \$ 455
Communications and Security	\$ - \$ -
Fire Suppression	\$ - \$ -
Elevators and Escalators	\$ - \$ -
Spare parts	\$ - \$ -
WFCY S&I Building	\$ - \$ -
Traction Power Supply	\$ - \$ -
ATC Supply	\$ - \$ -
Cathodic Protection and Corrosion Control System	\$ - \$ -
Contact Rail and Hardware Supply	\$ - \$ -
Wiehle Avenue Replacement Parking	\$ 43 \$ 455
	\$ 411 \$ 455

These redactions are necessary to protect the financial interests of the Airports Authority and Commonwealth of Virginia as well as those of Fairfax and Loudon Counties as local funding partners. The redactions are only in sections that address estimated amounts for individual allowances that could affect bidding strategies of future competitors, insurance cost information, or other information that allows computation of pricing information that is confidential.

## FTA Internal Pre-Decisional Document

### Item 1.2 Route 7 enhancements

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$86.509 million

**Description of Change:** The original plan for construction of the DCMP was to route the line as an elevated structure in the current service road along the southern side of Route 7. Only those utilities which interfered with construction of the support columns would need to be moved. The current plan being put forward by Fairfax County is to eliminate the service road along Route 7 and convert Route 7 from 6 lanes to eight lanes with the DCMP located in the median. Utilities will be relocated to a corridor adjacent to rather than under the highway to facilitate maintenance. Since the modification to the Route 7 cross-section is not needed for the rail project, it would be possible for the roadway to be restored to its current condition after the rail project construction is finished. The proposed cost reduction would account for the differential between this restoration and changing of the cross section as is currently priced in the project cost.

**Cost Item Summary:** The worksheet presents the cost differential to support the additional costs beyond what is needed for the rapid transit system that were incurred in reconfiguring Route 7. This reconfiguration work must be done concurrent with the DCMP since it affects the project alignment and location of stations and aerial structure supports. If this work is not done at this time, the resulting DCMP alignment would preclude this improvement at a later date.

The construction costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$63.82 million of which \$8.99 million are Allowance Items, \$19.53 million is carried under T&M, and \$35.3 million is for ROW acquisition. The ROW cost is based on an analysis performed by DTP. In the PMOC's opinion, the ROW costs are reasonably accurate. Since this cost mitigation item is classified as the cost effectiveness exclusion, the pro-forma reflects the fully allocated design-build contractor costs.

**Recommendation:** The PMOC supports \$101.914 million as the BCE value of cost savings for Item 1.2

### Item 1.3 Spring Hill Road improvements

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$1.180 million

**Description of Change:** Improvements to Spring Hill Road were planned independently of the DCMP. They were added to the DCMP at the request of Fairfax County to parallel DCMP construction activities and to facilitate coordination of utility relocation and maintenance of traffic issues. The DCMP will only be responsible for the first 200 feet away from Route 7. Improvements to Spring Hill Road beyond 200 feet will be part of another project.

## FTA Internal Pre-Decisional Document

**Cost Item Summary:** The cost estimate for construction of the non-DCMP related improvements at Spring Hill Road was deducted from the current cost estimate to show the differential costs

The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$0.7 million of which \$0.35 million is an Allowance Item and \$0.35 million is utility relocation to be carried out under T&M. Since this cost mitigation item is classified as a cost effectiveness exclusion, the pro-forma reflects the fully allocated design-build contractor costs.

**Recommendation:** The PMOC supports *\$1.374 million* as the BCE value of cost savings for Item 1.3.

### Item 1.4 Wiehle Avenue Garage built by developer in conjunction with joint development with Fairfax County

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$47.638 million

**Description of Change:** All of the work associated with the Wiehle Avenue garage including bus bays and Kiss-and-Ride lot will be provided by a developer working in conjunction with Fairfax County.

**Cost Item Summary:** FTA has determined that because the garage, bus bays, and Kiss-and-Ride lot are essential for DCMP operations, this item cannot be removed from the cost effectiveness calculation. No further cost analysis was done.

**Recommendation:** FTA has determined that this item cannot be removed from the cost effectiveness calculation since the garage and associated bus bays are essential for DCMP operations. The PMOC supports *\$0* as the BCE value of cost savings for Item 1.4.

### Item 1.5 Wiehle Avenue bus bays

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$1.104 million

**Description of Change:** This change involves routing buses to unload in the existing bus bays and not constructing new bus bays on the exit lane. The implications on traffic at Wiehle Avenue have been studied and MWAA reports that the proposal is feasible making the bus bays on the exit ramp unneeded.

**Cost Item Summary:** The costs included in this item were taken from an estimate prepared for this item in Supplemental Engineering.

## **Cost Item 5: \$23.9 Million Reduction**

This item provides additional information in support of the cost mitigation initiatives related to the adjustments to the Owner's contingency associated with these changes. Included are:

- Cost Mitigation Summary Status table with the highlighted cost mitigation values related to Owner contingency.
- The October 2007 FTA Internal Pre-Decisional Document.
- PMOC Cost Reductions.

These documents provide the basis for adjustments to the Owner's Contingency used in the Project budget. As noted in the PMOC document (page 22) and calculations, the PMOC used, and MWAA concurred with the following values for Owner Contingency:

- Allocated contingency on FFP and allowance work – 11.3%
- Allocated contingency on T&M work – 11.3%
- Allocated contingency on ROW acquisition – 2.4%
- Allocated contingency on WMATA railcars – 4.6%
- Allocated contingency on WMATA maintenance vehicles – 11.3%
- Allocated contingency on MWAA PMSS work – 0.0%
- Unallocated contingency – 3.3%

This latter item reflects a 50-percent reduction in the overall percentage of unallocated contingency included in the Project budget. Thus, it is a conservative assumption. The cost mitigation initiatives have an overall contingency of 10.9 percent base on a weighted average of these contingencies.

COST MITIGATION STATUS SUMMARY

5

Item No.	DESCRIPTION	YOES X 1,000,000			YOES X 1,000,000			YOES X 1,000,000						NOTES		
		CURRENT BUDGET ESTIMATES			BUDGET - FFP vs. ALLOWANCES			CONFIRMED CHANGES								
		Not Federal Project Eligible	Technology/Ops Change	VE/Scope	FFP per PMOC (with Contingency)	Allowance/Other per PMOC (with Contingency)	Total (with Contingency)	FFP			Allowance per PMOC		Owner-Agency		Total	
								Negotiated Scope Change	Not Federal Project Eligible per PMOC	Owner's Contingency	Scope Change	Not Federal Project Eligible	Owner-Agency Cost per PMOC			Owner's Contingency
1.1	Optimize Improvements in West Falls Church Yard			\$ (27.9)	\$ (3.5)	\$ (24.4)	\$ (27.9)	\$ 0.5		\$ 0.1	\$ (20.0)		\$ (1.5)	\$ (2.9)	\$ (23.8)	FFP and Allowance Change Order Executed. Owner Agency savings are T&M work for deleted scope.
1.2	Route 7 Enhancements	\$ (99.0)			\$ (4.2)	\$ (94.7)	\$ (99.0)		\$ (3.7)	\$ (0.5)		\$ (11.7)	\$ (73.8)	\$ (9.3)	\$ (99.0)	Approved by FTA as Not Federal Project Eligible
1.3	Spring Hill Road Improvements	\$ (1.4)			\$ (0.2)	\$ (1.2)	\$ (1.4)		\$ (0.1)	\$ (0.0)		\$ (0.5)	\$ (0.6)	\$ (0.1)	\$ (1.4)	
1.4	Wiehle Avenue Garage built by Developer	\$ -			\$ -	\$ -	\$ -	\$ -		\$ -		\$ -			\$ -	No credit to be taken until Fairfax County reaches agreement with Developer.
1.5	Wiehle Avenue Bus Bays			\$ -	\$ -	\$ -	\$ -	\$ -		\$ -					\$ -	Remains in Project Scope.
1.6	Increase Min ATC design Headway & reduce Traction Power Requirements		\$ (13.0)		\$ (2.0)	\$ (11.0)	\$ (13.0)	\$ (2.0)		\$ (0.3)	\$ (9.6)			\$ (1.4)	\$ (13.3)	FFP and Allowance Change Order Executed.
1.7a	Use prefabricated Traction power Substations		\$ (8.4)		\$ (3.0)	\$ (5.4)	\$ (8.4)	\$ (3.6)		\$ (0.5)	\$ (4.7)			\$ (0.7)	\$ (9.4)	FFP and Allowance Change Order Executed.
1.7b	Use prefabricated Prewired signal houses		In 1.7a		In 1.7a											
1.8	Use Microprocessor based ATC system design instead of present Relay Logic and discrete wiring		\$ (2.5)		\$ (0.2)	\$ (2.3)	\$ (2.5)	\$ (0.2)		\$ (0.0)	\$ (2.0)			\$ (0.3)	\$ (2.5)	FFP and Allowance Change Order Executed.
1.9	Use LAN/WAN TCP/IP communications system instead of present DTS technologies.		\$ -		\$ -	\$ -	\$ -	\$ 0.3		\$ 0.0	\$ -			\$ (0.0)	\$ 0.4	FFP and Allowance Change Order Executed.
1.10	Separate non-ATC communication systems from the ATC system		\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -			\$ -	\$ -	FFP and Allowance Change Order Executed.
1.11	Eliminate provisions for the future station at Wolf Trap			\$ (4.7)	\$ (4.7)	\$ -	\$ (4.7)	\$ (6.0)			\$ (0.9)			\$ -	\$ (6.9)	FFP Change Order Executed.
1.12	Non-Recurring Rolling Stock Cost Allocation & Phasing	\$ (31.3)			\$ -	\$ (31.3)	\$ (31.3)						\$ (29.0)	\$ (2.2)	\$ (31.3)	WMATA has accepted the mitigations as mutually acceptable strategies as described in Mr. Catoe's letter to Mr. Bennett of September 6, 2007.
1.13	Reduce the number of maintenance vehicles and equipment			\$ (2.1)	\$ -	\$ (2.1)	\$ (2.1)						\$ (2.0)	\$ (0.1)	\$ (2.1)	
1.14	Use existing parking lots during construction of the Wiehle Avenue garage rather than building additional spaces.			\$ (2.0)	\$ (0.3)	\$ (1.7)	\$ (2.0)	\$ -		\$ -	\$ (1.6)			\$ (0.2)	\$ (1.8)	Allowance Change Order Executed.
1.15	Realignment to accommodate future 3rd lane widening	\$ (5.0)			\$ (1.2)	\$ (3.8)	\$ (5.0)		\$ (1.1)	\$ (0.2)		\$ (3.3)		\$ (0.5)	\$ (5.0)	MWAA has committed funding for these improvements from outside the Project
1.16	Implementation of revisions to stations			\$ (18.1)	\$ (3.1)	\$ (15.0)	\$ (18.1)	\$ 1.4		\$ 0.2	\$ (13.1)			\$ (1.9)	\$ (13.4)	FFP and Allowance Change Order Executed.
1.17	Platform Canopy length adjustment			\$ (8.5)	\$ (1.2)	\$ (7.3)	\$ (8.5)	\$ (0.4)		\$ (0.1)	\$ (6.4)			\$ (0.9)	\$ (7.7)	FFP and Allowance Change Order Executed.
1.18	Emergency Crossovers on the DIAAH	\$ (5.3)			\$ (1.3)	\$ (4.0)	\$ (5.3)		\$ (1.1)	\$ (0.2)		\$ (3.5)		\$ (0.5)	\$ (5.3)	MWAA has committed funding for these improvements from outside the Project
1.19	PMSS Contract adjustment			\$ (19.6)	\$ -	\$ (19.6)	\$ (19.6)						\$ (19.1)	\$ (0.6)	\$ (19.6)	MWAA and PMSS have agreed to an overall Phase 1 budget including this reduction.
TOTALS		\$ (141.9)	\$ (23.9)	\$ (82.9)	\$ (24.9)	\$ (223.7)		\$ (10.0)	\$ (6.0)	\$ (2.4)	\$ (57.4)	\$ (19.0)	\$ (126.1)	\$ (21.5)		
GRAND TOTAL		\$		\$ (248.6)	\$	\$ (248.6)	\$	\$	\$ (18.4)	\$	\$	\$	\$ (224.0)	\$	\$ (242.3)	

\$23.9M

# FTA Internal Pre-Decisional Document

## Methodology

The basis for evaluation is the project as described in Scope, Schedule, and Cost Reports prepared by the PMOC. MWAA presented documentation proposing incremental changes to the cost used for the Cost Effectiveness calculation. The purpose of this evaluation is to review these proposals and develop a recommendation for a Baseline Cost Estimate. The evaluation steps are summarized as follows:

- Characterize and classify the proposed cost mitigation measures
- Recommend which cost mitigation measures should be accepted
- Determine potential affect of cost mitigation measures in the base year construction cost
- Evaluate proposed savings in other project costs (engineering, indirect costs, fee, etc.)
- Estimate the potential change in the Base Year Cost.
- Recommend a change in the Baseline Cost Estimate

The first step is to characterize the cost mitigation proposal provided by the Grantee. This characterization includes presentation of the classification method used by MWAA and the proposed cost mitigation amount. The proposed cost mitigation amounts are then broken down into the contract packages affected. A review is made of the method used to classify direct construction costs and to determine other cost savings.

The second step is to evaluate each proposed Cost Mitigation Item for its classification and for its base year construction cost. The scope of each item is reviewed and the classification and applicability of the item for Baseline Cost Estimate is determined. The base year cost estimate for the acceptable scope is compared to the cost estimates provided in the Cost Mitigations document and to data previously received or provided by MWAA. An independent evaluation and estimate of the acceptable direct cost reductions is made.

The final step is to determine the potential for the reduction to the Baseline Cost Estimate. An estimate is made of potential reductions of other project costs, such as design engineering, construction management, indirect project costs, insurance, and fee, from the project cost estimate. An estimate is made of the potential reduction in project contingencies. For estimates done using base year costs, the estimated amount is escalated to determine the recommended change in the Baseline Cost Estimate.

### Definitions

The following definitions are used in this report.

**Base Year Cost:** The cost of an item of project scope in current year dollars. For this report the base year is 2007.

**Baseline Cost Estimate (BCE):** The total of all estimated costs to complete a Project at the time FTA and a Grantee enter into a Full Funding Grant Agreement. A BCE is derived from the cost estimates of the individual third party contracts and force account work that, in sum, constitute the

## **FTA Internal Pre-Decisional Document**

While the estimated change in Baseline Cost Estimate from the proposed Cost Mitigation Items is shown in Table 1, estimated change in the Total Project Cost is shown in Table 2. Table 2 also shows the anticipated reductions in the Firm Fixed Price, the Allowance Items, and MWAA Costs, as estimated in the MWAA Cost Mitigations document. Since the Cost Mitigation Items classified as Cost Effectiveness Exclusion items do not change the Total Project Cost, they are not included in this table. The reduction proposed in the Total Project Cost is \$134 million.

## FTA Internal Pre-Decisional Document

Project. A Baseline Cost Estimate reflects appropriate escalation of costs and dates from the Baseline Schedule for the Project, and contains a table showing sources of funding for the Project. It is not modified during construction or implementation of the Project.<sup>1</sup>

**Estimated Total Project Cost:** Estimated Total Project Cost reflects the total anticipated costs of the Project at the time of the FFGA award; usually, it will be the same amount as the Baseline Cost Estimate (BCE). Occasionally, a Grantee will choose to pursue activities or pay for items within the Project scope of work that are not eligible for Federal reimbursement; in that instance, the Estimated Total Project Cost will be larger than the BCE.<sup>1</sup>

### Review of Project Cost Mitigation Measures

Moving forward with the MWAA project budget of \$2,848 million is anticipated to have reduced the Cost Effectiveness rating used to prioritize FTA funded projects from Medium-Low to Low resulting in the loss of FTA funding. In order to avoid a decrease in rating, high level meetings were held among the principal project participants including the Commonwealth of Virginia, MWAA, WMATA, and Fairfax County to seek ways of reducing the project cost. These meetings produced general agreement among these stakeholders to reduce the Baseline Cost Estimate by incorporating several technical changes and scope reductions into the project and to clarify that certain aspects of the project are not eligible for FTA funding. DCMP has further developed scope and cost estimates for these Cost Mitigation Items.

The project budget proposed as the Baseline Cost Estimate for the project after Cost Mitigation is \$2,508 million as shown in Appendix B. This budget represents a BCE reduction of \$340 million, based on \$303 million in base year (2007) cost reductions, from the MWAA budget of \$2,848 million.

### Classification of Cost Mitigation Measures

MWAA has presented nineteen items for consideration as cost mitigation measures. MWAA has classified each of the cost mitigation measures into one of three groups: Cost Effectiveness Exclusion, Technology/Operations Change, or VE/Scope Reduction.

#### Cost Effectiveness Exclusion

The rationale for proposing a Cost Effectiveness Exclusion is to reduce the Baseline Cost Estimate by excluding certain project scope from the Cost Effectiveness calculation. Items in this classification represent improvements to present or future non-transit facilities that are funded by one of the local project sponsors but not needed to support the rail transit system. These items of work will be constructed as part of the DCMP, but not being needed for the rail transit expansion, are not eligible for FTA funding.

#### Technology/Operational Change

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<sup>1</sup> Source: FTA Circular C 5200.1A Full-Funding Grant Agreements Guidance, Appendix A, issued May 12, 2002.

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Change of Technology / Operational Changes are changes in the scope of work resulting from changes in system concepts from those used in the preparation of the 100% PE drawings and technical specifications.

### VE/Scope Reduction

VE/Scope Reductions are actual reductions in the scope of work for the project that typically originated through the value engineering (VE) process.

The cost mitigation items proposed by MWAA are listed in Table 1 below. This table is taken from the MWAA document Cost Mitigations to Meet Cost Effectiveness dated September 20, 2007.

Table 1 – Summary of Cost Mitigation Items

Item No.	Description	Cost Effectiveness Exclusion	Technology/Operational Changes	VE/Scope Reduction
1.1	Optimize improvements in the West Falls Church Yard			\$27.0
1.2	Route 7 enhancements	\$86.5		
1.3	Spring Hill Road improvements	\$1.2		
1.4	Wiehle Avenue Garage built by developer in conjunction with joint development with Fairfax County	\$47.6		
1.5	Wiehle Avenue bus bays			\$1.1
1.6	Increase minimum ATC design Headway from 90 seconds to 135 seconds and reduce traction power requirements		\$20.3	
1.7a	Use prefabricated traction power substations		\$13.4	
1.7b	Use prefabricated, pre-wired signal houses		\$1.6	
1.8	Use microprocessor-based ATC system design instead of present relay logic and discrete wiring		\$3.7	
1.9	Use LAN/WAN TCP/IP communications systems instead of present DTS technologies		\$2.0	
1.10	Separate non-ATC communications systems from the ATC system		\$2.2	
1.11	Eliminate provisions for a future station at Wolf Trap			\$6.9
1.12	Non-recurring rolling stock cost allocation	\$24.0	Based on WMATA analysis	
1.13	Reduce the number of maintenance vehicles and equipment			\$1.8
1.14	Use existing parking lots during construction of the Wiehle Avenue Garage rather than building additional spaces			\$2.0

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Item No.	Description	Cost Effectiveness Exclusion	Technology/Operational Changes	VE/Scope Reduction
1.15	Eliminate realignment to accommodate future 3 <sup>rd</sup> lane widening	\$4.3		
1.16	Implementation of revisions to stations			\$16.4
1.17	Platform canopy length adjustment			\$8.7
1.18	Emergency crossovers on the DIAAH	\$5.2		
1.19	PMSS contract adjustment			\$27.1
<b>Totals</b>		<b>\$168.9</b>	<b>\$43.2</b>	<b>\$91.0</b>
			<b>\$303.1</b>	

### Contract Packages Affected by Cost Mitigation Items

The purpose of this section is to describe which contract packages are affected by the proposed Cost Mitigation Items. At this time the contract packaging is such that all project scope, except work included in the Firm Fixed Price portion of the Design-Build Contract, are estimated costs. For the Firm Fixed Price portion of the Design-Build Contract, any estimated change from a Cost Mitigation Item must be negotiated as a price reduction in the FFP.

Cost Mitigation Items that are classified as Cost Effectiveness Exclusion items will result in a reduction of the Baseline Cost Estimate without any changes to the DTP Design-Build Contract or to the Total Project Cost. Implementation of the Technical/Operational Change or VE/Scope Reduction items will reduce both the Baseline Cost Estimate and the Total Project Cost.

The Cost Mitigation calculation presented by MWAA divides project costs into five categories: Firm Fixed Price, Allowance Items, Time and Material, Real Estate, and Other Costs. The realization of the reductions proposed in the Firm Fixed Price portion of the Design-Build Contract need to be negotiated with DTP. This work is the DTP self-performed work and the DTP design engineering and construction management as well as indirect expenses, insurance, and fee. The effectiveness of MWAA's negotiations with DTP to achieve a price reduction in the Firm Fixed Price presents a significant risk.

Changes in the estimate for Allowance Items represents scope that will need to be negotiated with subcontractors before inclusion into the Firm Fixed Price. Therefore the cost risk for reductions in scope in Allowance Items is borne by MWAA and any savings will be fully realized by a redefinition of the subcontracted scope of work. However, the design engineering, construction management, and indirect costs associated with the Allowance Items are included in the Firm Fixed Price and must be included in that negotiation.

Time and Material items, Real Estate acquisition costs and Other Costs, including WMATA and MWAA, are costs borne by MWAA as incurred; MWAA bears all risk for these estimated costs.



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### Review of Cost Mitigation Items

This section contains a description and commentary on each proposed Cost Mitigation Item. The MWAA Proposed Cost Reductions are shown in base year cost, not as BCE reductions. The PMOC recommendations are shown as BCE adjustments and have been calculated using the method described in the following section of this report.

#### Item 1.1 Optimize improvements in the West Falls Church Yard

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$27.047 million later revised to \$25.739 million.

**Description of Change:** The changes will consist of construction of a stand-alone maintenance shop in West Falls Church Yard, elimination of the large retaining wall adjacent to Interstate Route 66, retention of roadways in yard area, and avoidance of utility relocation. The stand-alone shop is proposed to utilize a portable jacking system rather than in-floor car hoists. The storage capacity being added to the yard is 34 cars, reduced from 54 cars. It is proposed that TPSS #1 be moved from the yard to the Dulles Corridor alignment.

**Cost Item Summary:** The Supplemental Engineering, which detailed the expansion of West Falls Church Shop, included a cost estimate with \$31.6 million in direct construction costs. In addition there was a need to add two tracks, including signals and traction power, to the yard. MWAA has suggested \$15.8 million is direct cost reductions.

The PMOC has reviewed the estimate prepared for the Supplemental Engineering. The proposed stand-alone building is similar in size to the proposed building expansion for the West Falls Church Shop. However, avoidance of relocating the loading dock at the shop and deletion of the in-floor jacks has reduced the foundation costs about \$2.3 million. The provision of portable jacking systems in lieu of car hoists and turntables saves \$4.0 million in equipment costs. The cost of the retaining wall was estimated at \$3.4 million. Deletion of trackwork, signals, and traction power is an additional \$6.4 million reduction in direct costs. The construction at West Falls Church Shop is priced in Allowance Items for Site Development, Train Control, Traction Power, and the West Falls Church Shop line item.

It should be noted that the proposed changes in scope at West Falls Church Shop and Yard are conceptual. It may take up to 2 months for the work at this site to be brought to the 100% PE level and to develop a detailed cost estimate.

**Recommendation:** The PMOC supports \$27.704 million as the BCE value of cost savings for *Option 1 Item 1.1a*.

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### Item 1.2 Route 7 enhancements

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$86.509 million

**Description of Change:** The original plan for construction of the DCMP was to route the line as an elevated structure in the current service road along the southern side of Route 7. Only those utilities which interfered with construction of the support columns would need to be moved. The current plan being put forward by Fairfax County is to eliminate the service road along Route 7 and convert Route 7 from 6 lanes to eight lanes with the DCMP located in the median. Utilities will be relocated to a corridor adjacent to rather than under the highway to facilitate maintenance. Since the modification to the Route 7 cross-section is not needed for the rail project, it would be possible for the roadway to be restored to its current condition after the rail project construction is finished. The proposed cost reduction would account for the differential between this restoration and changing of the cross section as is currently priced in the project cost.

**Cost Item Summary:** The worksheet presents the cost differential to support the additional costs beyond what is needed for the rapid transit system that were incurred in reconfiguring Route 7. This reconfiguration work must be done concurrent with the DCMP since it affects the project alignment and location of stations and aerial structure supports. If this work is not done at this time, the resulting DCMP alignment would preclude this improvement at a later date.

The construction costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$63.82 million of which \$8.99 million are Allowance Items, \$19.53 million is carried under T&M, and \$35.3 million is for ROW acquisition. The ROW cost is based on an analysis performed by DTP. In the PMOC's opinion, the ROW costs are reasonably accurate. Since this cost mitigation item is classified as the cost effectiveness exclusion, the pro-forma reflects the fully allocated design-build contractor costs.

**Recommendation:** The PMOC supports *\$101.914 million* as the BCE value of cost savings for Item 1.2

### Item 1.3 Spring Hill Road improvements

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$1.180 million

**Description of Change:** Improvements to Spring Hill Road were planned independently of the DCMP. They were added to the DCMP at the request of Fairfax County to parallel DCMP construction activities and to facilitate coordination of utility relocation and maintenance of traffic issues. The DCMP will only be responsible for the first 200 feet away from Route 7. Improvements to Spring Hill Road beyond 200 feet will be part of another project.

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**Cost Item Summary:** The cost estimate for construction of the non-DCMP related improvements at Spring Hill Road was deducted from the current cost estimate to show the *differential costs*

The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$0.7 million of which \$0.35 million is an Allowance Item and \$0.35 million is utility relocation to be carried out under T&M. Since this cost mitigation item is classified as a cost effectiveness exclusion, the pro-forma reflects the fully allocated design-build contractor costs.

**Recommendation:** The PMOC supports *\$1.374 million* as the BCE value of cost savings for Item 1.3.

### Item 1.4 Wiehle Avenue Garage built by developer in conjunction with joint development with Fairfax County

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$47.638 million

**Description of Change:** All of the work associated with the Wiehle Avenue garage including bus bays and Kiss-and-Ride lot will be provided by a developer working in conjunction with Fairfax County.

**Cost Item Summary:** FTA has determined that because the garage, bus bays, and Kiss-and-Ride lot are essential for DCMP operations, this item cannot be removed from the cost effectiveness calculation. No further cost analysis was done.

**Recommendation:** FTA has determined that this item cannot be removed from the cost effectiveness calculation since the garage and associated bus bays are essential for DCMP operations. The PMOC supports *\$0* as the BCE value of cost savings for Item 1.4.

### Item 1.5 Wiehle Avenue bus bays

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$1.104 million

**Description of Change:** This change involves routing buses to unload in the existing bus bays and not constructing new bus bays on the exit lane. The implications on traffic at Wiehle Avenue have been studied and MWAA reports that the proposal is feasible making the bus bays on the exit ramp unneeded.

**Cost Item Summary:** The costs included in this item were taken from an estimate prepared for this item in Supplemental Engineering.

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**Recommendation:** MWAA has notified the PMOC that this item is being withdrawn as a Cost Mitigation Item and therefore it remains in the Baseline Cost Estimate. The PMOC supports \$0 as the BCE value of cost savings for Item 1.5.

### **Item 1.6 Increase minimum ATC design Headway from 90 seconds to 135 seconds and reduce traction power requirements**

**Cost Mitigation Group:** Technology/Operations Change

**MWAA Proposed Cost Reduction:** \$20.290 million

**Description of Change:** This change involves spacing train control signals to allow 135 second headways instead of 90 second headways. The main benefit of this change is that trains will be kept further apart and so the traction power requirements are reduced. Also, fewer signal track circuits would be required. Eight TPSS units will be decreased from an installed capacity of 9 mega-watts (MW) to 6 MW installed but expandable to 9 MW for future operational needs.

**Cost Item Summary:** The traction power cost reductions evaluation is based on using the following "ballpark" allowances for Modular Traction Power Substation Components:

- 3 MW Transformer/Rectifier Unit - \$750K
- Install Transformer/Rectifier Unit - \$150K
- Enclosure/Site Work - \$200K
- Land - \$ 75K

Six Alternatives (Cases A-F) are shown on the MWAA support calculation spreadsheet. Case A is the current plan and uses the GEC estimate for equipment and facility costs. Case B is the identical power capacity and distribution plan, using Modular equipment in place. Case E on the TPSS Cost Backup spreadsheet is the support column for this item.

An evaluation of Item 1.6 – Increase minimum ATC design Headway from 90 seconds to 135 seconds and reduce traction power requirements is a comparison of Case B vs. Case E. The PMOC has the following comments and issues:

1. This item has similar problems to those discussed in Cost Reduction 1.7a below. Case E essentially cuts the TPSS equipment costs by 1/3 by eliminating 1 of 3 - 3MW transformer/rectifier units. This is not an accurate method for estimating the savings, since the costs for AC switchgear, DC feeder breakers, auxiliary transformers, UPS et. al. are not reduced by 1/3.
2. There should be installation cost savings for reducing the number of 3MW transformer/rectifier units. TPSS installation costs are in the FFP portion of the project. Installation savings need to be removed from the Allowance column and transferred to the FFP column.
3. No additional backup support was provided for the ATC savings; however, in the PMOC's opinion, the costs shown for materials and labor are reasonable "ballpark" costs.

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4. The PMOC does not concur with the savings of \$583,000 in Final Design Engineering and CM/PM costs.

The PMOC prepared an estimate for the potential savings using the MWAA GEC cost estimate data. The potential direct cost savings are:

FFP - \$1,589,000  
Allowance - \$7,701,000  
Engineering - \$200,000

**Recommendation:** The PMOC supports \$12.909 million as the BCE value of cost savings for Item 1.6.

### **Item 1.7a Use prefabricated traction power substations**

**Cost Mitigation Group:** Technology/Operations Change

**MWAA Proposed Cost Reduction:** \$13.367 million

**Description of Change:** The original PE design concept was to construct buildings to house the Traction Power Substations (TPSS) and Tie-Breaker Stations (TBS). The equipment in these rooms would be installed on site. The change is to procure traction power equipment in prefabricated enclosures at seven TPSS and two TBS locations.

**Cost Item Summary/Recommendation:** The TPSS cost reductions evaluation is based on using the following “ballpark” allowances for Modular Traction Power Substation Components:

- 3 MW Transformer/Rectifier Unit - \$750K
- Install Transformer/Rectifier Unit - \$150K
- Enclosure/Site Work - \$200K
- Land - \$ 75K

Six Alternatives (Cases A-F) shown on the MWAA support calculation spreadsheet. Case A is the current plan and uses the GEC estimate for equipment and facility costs. Case B is the identical power capacity and distribution plan, using Modular equipment in place.

An evaluation of Cost Reduction Item 1.7a – Use of Prefabricated Traction Power Substations is a comparison of Case A vs. Case B. The PMOC has the following comments and issues:

1. The MWAA GEC estimate (Case A) included all substation equipment, including AC and DC switchgear, auxiliary transformers, UPS, batteries, et. al. – the Case B estimate appears to only include the transformer/rectifier units.
2. The MWAA GEC estimate is location specific; there are higher equipment costs at TPSS#1 because it has more feeder breakers. The Case B estimate is a generic cost with all substations having identical equipment costs.
3. The document Cost Reduction Descriptions r4 1 states that modular substations would be used at locations that are remote from passenger stations and stating that seven substation locations are affected. The Case B estimate shows all 10 substations converted to modular units. (Note: MWAA has subsequently corrected this to show 7 substation sites.)

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4. It is not clear what the allowance of \$200K for enclosure/site work includes. Roadway access to the substations will have to be provided; site prep and a concrete slab as well as conduit installation. It is implied that an aesthetical exterior façade will also be provided; \$200,000 seems too low for all this work. (MWAA subsequently increased this allowance to \$250,000, which is the figure the PMOC developed)
5. The savings related to modular substation equipment is not in the equipment procurement costs; in fact, the modular components are likely to be more expensive because they are pre-assembled and are designed for exterior use. The savings are in the installation costs and facility (building costs). Labor costs are in the FFP portion of the project scope, not the Allowance Item for Traction Power Supply. This will also hold true for the two TBS locations.

The PMOC prepared an estimate for the potential savings using the MWAA GEC cost estimate data. The potential direct cost savings are:

FFP - \$1,388,364

Allowance - \$4,008,814

Engineering - \$350,000

**Recommendation:** The PMOC supports *\$7.562 million* as the BCE value of cost savings for Item 1.7a.

### Item 1.7b Use prefabricated, pre-wired signal houses

**Cost Mitigation Group:** Technology/Operations Change

**MWAA Proposed Cost Reduction:** \$1.570 million

**Description of Change:** At six locations in the vicinity of where modular TPSS units will be installed, it is proposed to install prefabricated pre-wired ATC signal houses within the TPSS enclosure.

**Cost Item Summary:** Similar to 1.7a, the procurement cost of prefabricated, pre-wired signal houses will be more expensive than the procurement of individual components. Allowance costs for ATC supply will likely increase. The savings are in the equipment installation and facility structures, which are in the FFP portion of the budget.

The PMOC estimate for this work is as follows:

FFP - \$1,175,000

Allowance - (-\$250,000)

Engineering - \$75,000

**Recommendation:** The PMOC supports *\$806,000* as the BCE value of cost savings for Item 1.7b.

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### Item 1.8 Use microprocessor-based ATC system design instead of present relay logic and discrete wiring

**Cost Mitigation Group:** Technology/Operations Change

**MWAA Proposed Cost Reduction:** \$3.740 million

**Description of Change:** This proposal would change the preliminary engineering design for the ATC system from a vital-relay with discrete wiring configuration to a microprocessor-based design.

#### **Cost Item Summary:**

1. No additional backup support was provided for the ATC savings; however, in the PMOC's opinion, the costs shown for materials savings are reasonable "ballpark" costs.
2. Item 1.6 has already taken a cost savings for pre-wiring the signal houses. The microprocessors will be part of the pre-wired signal houses; therefore it is the PMOC's opinion that the savings of \$500,000 for FFP installation is too high. We estimate the savings to be in the \$100,000 range, including testing and commissioning savings.
3. It is the PMOC's opinion that the Final Design Engineering and CM/PM cost savings of \$295,000 is too high and we believe it will be in the \$50,000 range.

The PMOC estimate for this work is as follows:

FFP - \$100,000  
Allowance - \$1,600,000  
Engineering - \$50,000

**Recommendation:** The PMOC supports \$2.484 million as the BCE value of cost savings for Item 1.8.

### Item 1.9 Use LAN/WAN TCP/IP communications systems instead of present DTS technologies

**Cost Mitigation Group:** Technology/Operations Change

**MWAA Proposed Cost Reduction:** \$2.035 million

**Description of Change:** This proposal would change the current preliminary engineering design for the communication system from the telephone-technology configuration (DTS) to a TCP/IP protocol on a LAN/WAN network.

#### **Cost Item Summary:**

1. No additional backup support was provided to support the cost savings.
2. A review of the MWAA GEC estimate titled "Dulles Detail Cost Estimate - Full Document" shows a total cost of \$350,000 for PBX equipment.
3. The savings of \$3,300,000 for elimination of installation of this equipment is excessive. A savings in the \$400,000 to \$500,000 is generous.

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4. The savings on PBX testing is excessive. Savings of \$50,000 in FFP and \$50,000 in the Allowance Items are more reasonable.
5. It must be noted that WMATA is currently investigating the available options for replacing its PBX-based system. While a LAN/WAN is one of the potential systems, WMATA has made no commitment to this technology. The communications system selected for Dulles must be compatible with whatever system WMATA selects.

Based on a review of the MWAA GEC communications estimate, it is the PMOC's opinion that the potential savings for eliminating the PBX network are greatly overstated. Given the design uncertainties, it is the PMOC's opinion that there are no clear cost savings for this item.

**Recommendation:** The PMOC supports \$0 as the BCE value of cost savings for Item 1.9.

### Item 1.10 Separate non-ATC communications systems from the ATC system

**Cost Mitigation Group:** Technology/Operations Change

**MWAA Proposed Cost Reduction:** \$2.207 million

**Description of Change:** This proposal would configure the N-Line communication system with non-ATC communications separated from the ATC system and connected to the WMATA communications "backbone" using LAN/WAN technology. This item is essentially an expansion of Item 1.9 to cover non-vital signal communications.

#### **Cost Item Summary:**

1. No additional backup support was provided to support the cost savings.
2. A review of the GEC estimate titled "Dulles Detail Cost Estimate – Full Document" did not show any additional cost for PBX equipment being installed at the ATC rooms, over and above those identified in Item 1.9.
3. The estimated value of the PBX savings totals \$5,300,000 which is more than 19% of the total ATC Supply Allowance costs. It is the PMOC's opinion that this percentage is much too high.

It is the PMOC's opinion that the potential savings for eliminating the PBX network are greatly overstated. Given the design uncertainties, it is the PMOC's opinion that there are no clear cost savings for this item.

**Recommendation:** The PMOC supports \$0 as the BCE value of cost savings for Item 1.10.

### Item 1.11 Eliminate provisions for a future station at Wolf Trap

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$6.879 million

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**Description of Change:** This proposal would eliminate the provision in the alignment to create a section of straight level track and provide the structural foundations near the guideway. Because of the slope of the DIAAH at this location, a significant adjustment is necessary in the track alignment including two large retaining walls and piles to support a future station. An emergency turnaround incorporated into the design of the alignment in this area, will not be built.

**Cost Item Summary:** The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$4.48 million, which also reflects the deletion of the costs associated with one DIAAH Emergency Crossover which had been designed as part of the station structure. Engineering costs will be incurred by MWAA to re-engineer the alignment and profile. The costs to engineering costs to design the required fill, piles, foundations, and retaining walls will be eliminated. The FFP includes \$4.13 million of this direct construction cost; the recovery of this amount and any other associated costs is subject to negotiation.

**Recommendation:** The PMOC supports *\$4.675 million* as the BCE value of cost savings for Item 1.11.

### Item 1.12 Non-recurring rolling stock cost allocation

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$24.018 million

**Description of Change:** The project budget was based on a stand-alone order for the design and manufacture of 64 cars. The proposal is to purchase all 128 cars for the Dulles Corridor Metrorail project in one order. Non-recurring costs for the design and testing are allocated to all cars of the base order. This reduction reflects the decrease in average per car cost when non-recurring costs are distributed over the entire 128 car order.

**Cost Item Summary:** WMATA has offered to MWAA that a cost reduction for the Phase 1 vehicles of \$24 million would be possible if the entire order of 128 cars for Phase 1 and Phase 2 of the DCMP were placed in a single order. This reduction is from the WMATA portion of the project budget.

Since the cost variation in this item relates primarily to market and bidding conditions, budget to be allocated to WMATA for rail vehicles will not be known until the rail vehicle contract is procured. WMATA has no risk in this procurement; therefore their offer of a \$24 million reduction should not be binding on MWAA. The PMOC has estimated that half of the estimated cost of design development is \$29.03 million based on the estimated procurement of \$190 million that was included in the August 2007 MWAA Project Budget. Including contingencies, the BCE cost reduction recommended would be \$31.3 million.

Realization of these savings is dependent on MWAA commitment to procure all 128 cars for the DCMP in a single order. As of this date, the PMOC is not aware that such a commitment has been made.

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**Recommendation:** Given that MWAA has not committed to the procurement of 128 vehicles, the BCE reduction for non-recurring costs cannot be recommended. The PMOC supports \$0 as the BCE value of cost savings for Item 1.12 *at this time*.

### **Item 1.13 Reduce the number of maintenance vehicles and equipment**

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$1.809 million

**Description of Change:** WMATA reviewed and agreed to revise their list of maintenance vehicles and equipment to be purchased as part of the project to support maintenance of the Extension to Wiehle Avenue.

**Cost Item Summary:** This reduction is from the WMATA budget and from project contingencies. MWAA has the obligation under the MWAA-WMATA IGA to support the procurement of additional maintenance vehicles should this be shown to be needed. In prior reviews of this scope item, the PMOC expressed the view that this item was more than ample; it remains so at the proposed level.

**Recommendation:** The PMOC supports *\$1.953 million* as the BCE value of cost savings for Item 1.13.

### **Item 1.14 Use existing parking lots during construction of the Wiehle Avenue Garage rather than building additional spaces**

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$2.049 million

**Description of Change:** This proposal would eliminate the construction of new parking spaces to accommodate parking spaces lost to construction and construction staging at the existing Park-and-Ride Lot at Wiehle Avenue. The Design-Build Contractor's execution plan has changed and does not have the level of impact previously anticipated. Fairfax County has additional parking spaces available in other Fairfax county owned parking lots.

**Cost Item Summary:** This Item was priced as an Allowance Item in the Design-Build Contract. The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$1.21 million. The engineering costs associated with this change are minor, but since they are included in the FFP, recovery of this amount and any other associated costs is subject to negotiation.

**Recommendation:** The PMOC supports *\$1.996 million* as the BCE value of cost savings for Item 1.14.

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### Item 1.15 Eliminate realignment to accommodate future 3<sup>rd</sup> lane widening

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$4.329 million

**Description of Change:** The track alignment shown in the preliminary engineering drawings accommodates a future third lane for the DIAAH. The accommodations made to achieve this alignment are beyond what is necessary for the rapid transit system.

**Cost Item Summary:** The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$2.55 million for direct construction cost. Since this cost mitigation item is classified as the cost effectiveness exclusion, the pro-forma used should reflect the fully allocated design-build contractor costs.

**Recommendation:** The PMOC supports *\$4.967 million* as the BCE value of cost savings for Item 1.15.

### Item 1.16 Implementation of Revisions to Stations

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$16.409 million

**Description of Change:** This item includes several proposals for a more cost effective station design while still maintaining the functionality of the stations. Among the items included are the use of pre-cast cladding elements, replacement of selected brick/block walls with a textured pre-cast system, refinement of platform, mezzanine, pedestrian bridge and bus shelter canopy shapes, and revisions to stainless material at curtain wall & rail, decorative lighting, floor finishes and roofing systems.

**Cost Item Summary:** The cost savings presented for this item are shown as net cost reductions in each construction specification division based on a review of the existing architectural designs by DTP and MWAA. The items listed for cost reduction have been noted as having room for cost reduction without unacceptable reduction in quality. Although the amount of the proposed savings is significant, it is relatively low when considered as a percentage of the overall cost of the Stations. As such it seems reasonable and achievable.

**Recommendation:** The PMOC supports *\$18.026 million* as the BCE value of cost savings for Item 1.16.

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### Item 1.17 Platform Canopy Length Adjustment

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$8.658 million

**Description of Change:** This change is to reduce the platform canopy length to typical WMATA Metrorail platform coverage. The reduction is 200 to 300 feet at most stations.

**Cost Item Summary:** The costs included in this item were taken from the previously priced Open Item to increase the canopy length beyond what was in the original 100% Preliminary Engineering documents. From a construction viewpoint, this is entirely a Scope Reduction rather than a VE reduction in that less canopy will be built. The value suggested for this seems reasonable and achievable. The cost used is the cost included in the Allowance Item in the Design-Build contract for Station Finishes. The engineering costs associated with this change are minor, but since they are included in the FFP, recovery of this amount and any other associated costs is subject to negotiation.

**Recommendation:** The PMOC supports \$8.433 million as the BCE value of cost savings for Item 1.17.

### Item 1.18 Emergency Crossovers on the DIAAH

**Cost Mitigation Group:** Cost Effectiveness Exclusion

**MWAA Proposed Cost Reduction:** \$5.191 million

**Description of Change:** The primary purpose of these improvements is to facilitate emergency vehicle access between the Dulles Toll Road and the DIAAH. This work is to support the Dulles Toll Road and the DIAAH and will be funded by MWAA as a Dulles Toll Road Improvement. It is not needed to provide rapid transit services.

**Cost Item Summary:** The costs presented are reasonable and consistent with previous estimates. Base Year Costs (2007) are acceptable at \$2.71 million for direct construction cost, which reflects the deletion of costs associated with one crossover now carried under the Wolf Trap Station deletion, Item 1.11. Since this cost mitigation item is classified as the cost effectiveness exclusion, the pro-forma used should reflect the fully allocated design-build contractor costs.

**Recommendation:** The PMOC supports \$5.277 million as the BCE value of cost savings for Item 1.18.

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### Item 1.19 PMSS Contract Adjustment

**Cost Mitigation Group:** VE/Scope Reduction

**MWAA Proposed Cost Reduction:** \$27.066 million

**Description of Change:** The staffing for MWAA technical support and management oversight of the Project was based on the DCMP Phase 1 work being a stand-alone project. MWAA's current commitment to building Phase 2 has enabled MWAA to have these resources serve both Phases thereby reducing the technical support and management oversight costs for Phase 1.

**Cost Item Summary:** The verification of this staffing allocation will be reviewed in conjunction with the review of the staffing charts in the Project Management Plan. The PMOC's opinion is that the Program Management Support Services (PMSS) staff will increase for Phase 2 in lieu of having staff shift from Phase 1. Over the 5-year project duration of Phase 1, the PMOC provisionally supports a 20% reduction in Phase 1 PMSS staff to Phase 2 activities. The estimated value of the PMSS contract for Phase 1 is approximately \$92 million. A 20% reduction represents \$18.4 million, about \$19.0 million with contingencies. However since MWAA has not yet committed to a Phase 2 schedule, this reduction can not be realized at this time.

**Recommendation:** Given that MWAA has not committed to a schedule for Phase 2 of the project, the BCE reduction for PMSS Contract Adjustment cannot be recommended. The PMOC further recommends MWAA issue change orders to the PMSS contract to document this action prior to FTA approval into Final Design. The PMOC supports \$0 as the BCE value of cost savings for Item 1.19 *at this time*.

### **Recommendation for Baseline Cost Estimate Adjustment**

This section describes the development of the estimated BCE adjustment for the Cost Mitigation Items and summarizes recommendations for Baseline Cost Estimate adjustments.

In the section above, a recommendation for the Baseline Cost Estimate is provided. This BCE was typically estimated by a comparison and evaluation of base year direct construction costs. A pro-forma, developed by the PMOC, was used to estimate other costs. These estimated costs were escalated to estimate the adjustment required in the Baseline Cost Estimate.

The following subsections describe the method of pro-forma calculation and the method of escalation. A summary of the recommended BCE adjustment completes the section.

### **Pro-Forma Calculation of Other Costs**

In order to calculate the other costs attributable to each Cost Mitigation Item a pro-forma calculation was developed to estimate these costs from the differences found in the direct construction costs. The pro-forma used was modeled after the pro-forma used by MWAA in

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their Cost Mitigations document. PMOC had some concern regarding the specific values used and the method of classifying certain items.

MWAA has estimated Design Engineering and CM/PM costs as 13.4% of sum of the FFP and Allowances direct costs. Yet the percentage of Design Engineering and CM/PM costs to direct costs, including Allowances, in previous project documents is approximately 29.6%. Since the Design Engineering and CM/PM costs are in the FFP, an actual reduction of this amount needs to be negotiated with DTP. For negotiated price reductions, a reduced percentage such as the 13.4% may be a reasonable estimate. However, the cost allocations indicate that the cost is actually the 29.6% engineering cost multiplied by a recovery efficiency factor. The PMOC considers this detail important, because the cost mitigation items that do not change the Total Project Cost should have engineering estimated at the full 29.6% value.

In certain cases, there is additional preliminary engineering necessary to accomplish the change in scope. The estimated additional engineering effort was estimated by MWAA but is treated as a direct construction cost. The PMOC has deducted the estimated preliminary engineering costs from the 29.6% engineering effort. The recovery efficiency factor is applied to the net engineering cost.

Similarly, non tax and insurance indirect costs, which are 6.8% of direct costs, may not be fully recoverable. It is reasonable to consider that indirect costs may not be affected by small changes in project scope; in this case an efficiency factor could be used. However, the CE Exclusion items should enjoy the full benefit of a cost allocation.

Similarly, the pro-forma considers that the contractor's contingency in the FFP is available in a negotiation for a scope reduction. The contingency shown in the Project Cost Estimate of \$113 million is roughly 20% of the FFP scope of work for direct and indirect costs. It is not clear, and it is not assumed, that there is any contingency attributable to the Allowance items. These items are to be negotiated in the future and therefore the Design-Builder has no risk in their ultimate cost. Yet the pro-forma attributes D-B contingency to both FFP and Allowance Items; the PMOC pro-forma applies it to FFP items only. Similarly, a recovery efficiency needs to be considered. No D-B contingency is applicable for T&M costs since the risk is with the Owner.

Taxes and insurance are applied as a percentage of the direct cost only. These costs should vary as a percentage of the sum of all of the costs and cost reductions above.

The PMOC is of the opinion that Fee can be recovered in negotiation as a pro-forma item. However, the recovery of fee will be limited by the recovery efficiency for all of the direct cost and pro-forma items where an actual FFP price reduction is needed.

Contingencies are shown in the MWAA pro-forma as MWAA Established Owner's Contingency and Additional FTA-Directed Contingency. The prior recommendation that MWAA increase the contingency amount does not result in a separable contingency between MWAA and FTA. The contingency amounts should be combined. The PMOC pro-forma shows the contingency as allocated and unallocated.

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### **Estimation of Recovery Efficiency**

The recovery factor used in the PMOC pro-forma for FFP price reduction is 100% for CE Exclusion Items and typically at 50% for all other proposed FFP price reductions. This is taken as a conservative recovery ratio; the Design-Build Contract terms and conditions may permit MWAA to achieve a better result. *To the extent that MWAA can negotiate a more favorable result with DTP for FFP price reductions a better result will occur.*

### **Estimation of Contingencies**

The pro-forma used calculates a reduction in allocated contingencies consistent with the average level of contingency used in the project budget.

The unallocated contingency has been set at \$128 million for the Total Project Cost. Due to the distribution of the unallocated contingency being unknown by definition, the PMOC considers a full value reduction of the unallocated contingency to be overstated. This is especially true where the BCE is reduced without a change in the Total Project Cost. The possible distribution of the unallocated contingency between the eligible and cost-excluded portions of the project suggest that the BCE not be overly reduced given the chance that the unallocated contingencies would be more heavily used for the eligible portions of the Project. *For calculation purposes an unallocated contingency of 3.3%, half of the 6.6% unallocated contingency in the Total Project Cost, was used.*

### **Method of Escalation**

For estimates where the cost evaluation and pro-forma calculation were done in base year costs, the cost was escalated to establish the Baseline Cost Estimate. FTA Circular C 5200 permits estimation of the BCE using either a cash flow method, similar to the New Starts template, or escalation to the mid-point of construction. The Dulles New Starts submission for FY 2009 averages for 9.6% for the Baseline Cost Estimate less finance cost. Recommendations for BCE adjustments, developed by escalating base year costs by the cost escalation, result in the Dulles FY 2009 New Starts submittal.

### **Summary of Recommendations**

The following table summarizes the PMOC recommendations for changes in the Baseline Cost Estimate.

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Table 3 – PMOC Recommendation for Cost Mitigation Items

Item No.	Description	Reduction Class	PMOC Recommendation (\$000)
1.1	Optimize improvements in the West Falls Church Yard	VE/Scope Reduction	\$27,704
1.2	Route 7 enhancements	Cost Effectiveness Exclusion	\$101,914
1.3	Spring Hill Road improvements	Cost Effectiveness Exclusion	\$1,374
1.4	Wiehle Avenue Garage built by developer in conjunction with joint development with Fairfax County	Cost Effectiveness Exclusion	Required for CE
1.5	Wiehle Avenue bus bays	VE/Scope Reduction	Withdrawn
1.6	Increase minimum ATC design Headway from 90 seconds to 135 seconds and reduce traction power requirements	Technology / Operations Change	\$12,909
1.7a	Use prefabricated traction power substations	Technology/ Operations Change	\$7,562
1.7b	Use prefabricated, pre-wired signal houses	Technology/ Operations Change	\$806
1.8	Use microprocessor-based ATC system design instead of present relay logic and discrete wiring	Technology/ Operations Change	\$2,484
1.9	Use LAN/WAN TCP/IP communications systems instead of present DTS technologies	Technology/ Operations Change	\$0
1.10	Separate non-ATC communications systems from the ATC system	Technology/ Operations Change	\$0
1.11	Eliminate provisions for a future station at Wolf Trap	VE/Scope Reduction	\$4,675
1.12	Non-recurring rolling stock cost allocation	Cost Effectiveness Exclusion	\$0
1.13	Reduce the number of maintenance vehicles and equipment	VE/Scope Reduction	\$1,953
1.14	Use existing parking lots during construction of the Wiehle Avenue Garage rather than building additional spaces	VE/Scope Reduction	\$1,996
1.15	Eliminate realignment to accommodate future 3 <sup>rd</sup> lane widening	Cost Effectiveness Exclusion	\$4,967
1.16	Implementation of revisions to stations	VE/Scope Reduction	\$18,026
1.17	Platform canopy length adjustment	VE/Scope Reduction	\$8,433
1.18	Emergency crossovers on the DIAAH	Cost Effectiveness Exclusion	\$5,277
1.19	PMSS contract adjustment	VE/Scope Reduction	\$0
<b>Total</b>			<b>\$200,079</b>

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Other recommendations are:

1. The Wiehle Avenue Garage is an integral element of this rail project and needs to be included in the cost effectiveness calculation. Should Fairfax County be successful in the current joint development solicitation, then this cost may be removed from the FFGA amount, or included as potential additional cost mitigation.
2. Engineering/Construction Management costs are in the Firm Fixed Price of the DTP Design-Build Contract. Early negotiation for reductions in FFP scope, including Final Design engineering and Construction Management, are recommended to achieve not only a higher recovery of estimated costs, but also a firm commitment for the estimated BCE reduction. *The PMOC recommends that these negotiations be completed prior to Final Design.*
3. For work that is not required for the Dulles project and will be removed from the Cost Effectiveness calculation, the full pro-rated value of engineering and other costs should be included in the BCE reduction (the Total Project Cost is unchanged).
4. Commitment for Phase 2 of the DCMP will enable BCE reductions for rail vehicle procurement of \$31.3 million and PMSS of \$19.0 million to be recommended.

Based on MWAA's revised pre-mitigation budget of \$2,848 million, it is the PMOC's opinion that with a cost reduction of \$200 million will result in a Baseline Cost Estimate of \$2,648 million.

### Conclusion

Based on the PMOC's analysis, MWAA is capable of securing a higher value of cost reductions. The PMOC recommends the FTA have MWAA finalize the scope changes and have these adjustments negotiated and contractually memorialized before the project is approved into Final Design.

The proposed reduction of the Baseline Cost Estimate (BCE) for items 1.12 – Non-recurring Rolling Stock Cost Allocation and 1.19 - Program Management Support Services rely upon the commitment to pursue Phase 2 of the Dulles Corridor Metrorail Project (DCMP). This commitment has not yet been made and therefore the proposed reductions in BCE of \$50.3 million are not recommended at this time.

It is the PMOC's recommendation that MWAA's proposed Cost Mitigation Items currently result in approximately a \$200 million reduction in the BCE from \$2,848 to \$2,648 million.

Appendices

Appendix A – Grantee Project Data

Document	Date	Author	Nature – Detail – Quality*
<i>Cost Estimates</i>			
Cost Mitigations to Meet Cost Effectiveness	Sept. 20, 2007	MWAA	Listing of individual items proposed for cost mitigation including scope and estimated cost.
MWAA Project Cost Estimate	June 22, 2007 June 20, 2007	MWAA	Based on MWAA's Adjusted Estimate and on the negotiated price. Supplements the previous report, <i>Design-Build Contract Cost Estimate</i> , which documented the estimated cost of the Design-Build contract portion of the project.
Guidance to Allowance Values	June 19, 2007 June 14, 2007	MWAA	Provides a summary of and substantiation for development of the values for the Allowances that are contained in the D/B Contract for the Project.
Project Capital Cost Estimate	April 2007 March 6, 2007	DRPT and MWAA	Cost estimate prepared by the DRPT GEC, STV Inc., and adjusted by DRPT/MWAA for Open Items and other issues.
Design-Build Open Scope Items	February 2007	DTP	Estimate takeoff for Supplemental Engineering
Partial Cost Report for Allowances	March 5, 2007	MWAA	
Scope Mods (A to Z)	April 2007	DRPT GEC	Independent estimate of Design-Build Open Scope Items. Includes detail for some Cost Mitigation Items.
Cost Report	January 29, 2007	DRPT GEC	Includes quantity take-offs for labor, materials, equipment, etc.

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<b>Document</b>	<b>Date</b>	<b>Author</b>	<b>Nature – Detail – Quality*</b>
<b><i>Plans, Technical Specifications, Studies, Etc.</i></b>			
Right of Way Acquisition Plan	May 31, 2007	DTP	ROW schedule continues to be the most significant risk. The ROW scope is acceptable, with a notation that the contamination/remediation issue may have some impact on ROW acquisition and the project in general. Recent Acquisition Plan comments on the cost estimate have recommended explanation of added costs for DTP support and owner's contingency.
<b><i>Environmental Documentation</i></b>			
Federal Transit Administration Record of Decision	Nov. 17, 2006 March 2, 2005	FTA	Record of Decision by FTA relative their findings the Final Environmental Impact Assessment.
<b><i>Agreements</i></b>			
Draft Cooperative Agreement between MWAA & the County of Fairfax, Virginia	June 11, 2007	MWAA & Fairfax	18 page draft agreement (unsigned)
Draft Intergovernmental Agreement between WMATA & MWAA	June 8, 2007	WMATA & MWAA	67 page agreement (unsigned)
<b><i>Other Documentation</i></b>			
New Railcar Procurement Assumptions	May 18, 2004	WMATA	Internal worksheets for schedule and cost estimate.

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## Appendix B – Grantee Project Cost Estimate – October 2007

<b>MAIN WORKSHEET-BUILD ALTERNATIVE</b>								(Rev.10, May 7, 2007)
Metropolitan Washington Airports Authority						Today's Date <b>9/13/07</b>		
Dulles Corridor Metrorail Project - Extension to Wiehle Avenue						Yr of Base Year \$ <b>2007</b>		
Application for Final Design						Yr of Revenue Ops <b>2013</b>		
	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
<b>10 GUIDEWAY &amp; TRACK ELEMENTS (route miles)</b>	<b>11.91</b>	<b>531,345</b>	<b>55,972</b>	<b>587,318</b>	<b>\$ 49,313</b>	<b>46%</b>	<b>26%</b>	<b>643,860</b>
10.01 Guideway: At-grade exclusive right-of-way			0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)				0				0
10.03 Guideway: At-grade in mixed traffic				0				0
10.04 Guideway: Aerial structure	3.10	249,597	28,598	276,195	\$ 89,095			302,785
10.05 Guideway: Built-up fill		0	0	0				0
10.06 Guideway: Underground cut & cover	0.05	18,724	1,782	18,506	\$ 370,124			20,288
10.07 Guideway: Underground tunnel	0.40	94,732	10,095	104,827	\$ 262,067			114,919
10.08 Guideway: Retained cut or fill	8.36	103,319	10,486	113,805	\$ 13,613			124,781
10.09 Track: Direct fixation		22,982	2,449	25,431				27,879
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		35,862	3,699	39,567				43,365
10.12 Track: Special (switches, turnouts)		8,131	868	8,997				9,864
10.13 Track: Vibration and noise dampening		0	0	0				0
<b>20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)</b>	<b>5</b>	<b>215,105</b>	<b>20,938</b>	<b>236,043</b>	<b>\$ 47,209</b>	<b>18%</b>	<b>10%</b>	<b>263,561</b>
20.01 At-grade station, stop, shelter, mall, terminal, platform	2	83,258	8,084	91,343	\$ 45,671			101,992
20.02 Aerial station, stop, shelter, mall, terminal, platform	3	89,312	9,401	108,714	\$ 36,238			121,387
20.03 Underground station, stop, shelter, mall, terminal, platform				0				0
20.04 Other stations, landings, terminals; Intermodal, ferry, trolley, etc.				0				0
20.05 Joint development				0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		32,535	3,452	35,986				40,182
<b>30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS</b>	<b>11.91</b>	<b>38,221</b>	<b>4,161</b>	<b>42,382</b>	<b>\$ 3,559</b>	<b>3%</b>	<b>2%</b>	<b>47,027</b>
30.01 Administration Building: Office, sales, storage, revenue counting		1,484	158	1,642				1,822
30.02 Light Maintenance Facility		0	0	0				0
30.03 Heavy Maintenance Facility		18,489	2,060	20,559				22,911
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track		18,239	1,944	20,182				22,394
<b>40 SITEWORK &amp; SPECIAL CONDITIONS</b>	<b>11.91</b>	<b>196,007</b>	<b>20,344</b>	<b>216,351</b>	<b>\$ 18,165</b>	<b>16%</b>	<b>9%</b>	<b>235,203</b>
40.01 Demolition, Clearing, Earthwork		14,469	1,092	15,561				16,917
40.02 Site Utilities, Utility Relocation		108,794	12,339	121,133				131,688
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		8,167	870	9,037				9,825
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		5,504	474	5,978				6,499
40.06 Pedestrian/ bike access and accommodation, landscaping		8,900	863	9,763				10,614
40.07 Automobile, bus, van accessways including roads, parking lots		8,609	379	8,988				9,771
40.08 Temporary Facilities and other indirect costs during construction		41,554	4,328	45,880				49,888
<b>50 SYSTEMS</b>	<b>11.91</b>	<b>209,688</b>	<b>21,770</b>	<b>231,458</b>	<b>\$ 19,434</b>	<b>18%</b>	<b>10%</b>	<b>254,335</b>
50.01 Train control and signals		50,188	5,338	55,523				61,011
50.02 Traffic signals and crossing protection		0	0	0				0
50.03 Traction power supply: substations		47,291	5,109	52,400				57,579
50.04 Traction power distribution: catenary and third rail		68,395	6,709	75,104				82,527
50.05 Communications		33,060	3,467	36,528				40,138
50.06 Fare collection system and equipment		6,430	685	7,115				7,818
50.07 Central Control		4,327	461	4,788				5,261
<b>Construction Subtotal (10 - 50)</b>	<b>11.91</b>	<b>1,190,366</b>	<b>123,185</b>	<b>1,313,552</b>	<b>\$ 110,290</b>	<b>100%</b>	<b>58%</b>	<b>1,443,986</b>
<b>60 ROW, LAND, EXISTING IMPROVEMENTS</b>	<b>11.91</b>	<b>50,447</b>	<b>1,229</b>	<b>51,676</b>	<b>\$ 4,339</b>		<b>2%</b>	<b>53,800</b>
60.01 Purchase or lease of real estate		48,791	1,190	49,981				52,035
60.02 Relocation of existing households and businesses		1,656	39	1,695				1,765
<b>70 VEHICLES (number)</b>	<b>64</b>	<b>138,683</b>	<b>3,260</b>	<b>141,943</b>	<b>\$ 2,218</b>		<b>6%</b>	<b>164,784</b>
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	64	134,629	3,260	137,889	\$ 2,155			160,077
70.03 Commuter Rail				0				0
70.04 Bus				0				0
70.05 Other		650		650				755
70.08 Non-revenue vehicles		3,404		3,404				3,952
70.07 Spare parts				0				0
<b>80 PROFESSIONAL SERVICES</b>	<b>11.91</b>	<b>559,708</b>	<b>64,812</b>	<b>624,520</b>	<b>\$ 52,437</b>	<b>48%</b>	<b>27%</b>	<b>673,280</b>
80.01 Preliminary Engineering		82,398	15,238	97,634				105,257
80.02 Final Design		136,142	14,862	151,004				162,794
80.03 Project Management for Design and Construction		108,437	9,797	118,234				127,465
80.04 Construction Administration & Management		189,428	21,365	210,793				238,031
80.05 Insurance		21,433	2,284	23,718				25,569
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		107	13	120				129
80.07 Surveys, Testing, Investigation, Inspection		0	0	0				0
80.08 Start up		11,765	1,254	13,018				14,035
<b>Subtotal (10 - 80)</b>	<b>11.91</b>	<b>1,939,205</b>	<b>192,486</b>	<b>2,131,691</b>	<b>\$ 178,983</b>		<b>93%</b>	<b>2,335,850</b>
<b>90 UNALLOCATED CONTINGENCY</b>				<b>113,342</b>			<b>5%</b>	<b>124,900</b>
<b>Subtotal (10 - 90)</b>	<b>11.91</b>			<b>2,245,033</b>	<b>\$ 188,500</b>		<b>98%</b>	<b>2,460,750</b>
<b>100 FINANCE CHARGES</b>				<b>36,567</b>			<b>2%</b>	<b>47,000</b>
<b>Total Project Cost (10 - 100)</b>	<b>11.91</b>			<b>2,283,620</b>	<b>\$ 191,740</b>		<b>100%</b>	<b>2,507,750</b>
Allocated Contingency as % of Base Yr Dollars w/o Contingency				9.93%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				5.84%				
Total Contingency as % of Base Yr Dollars w/o Contingency				15.77%				
Unallocated Contingency as % of Subtotal (10 - 80)				5.32%				
YOE Construction Cost per Mile (X000)								\$121,241
YOE Total Project Cost per Mile Not Including Vehicles (X000)								\$196,723
YOE Total Project Cost per Mile (X000)								\$210,558

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Table 2 – Distribution of Proposed Total Project Cost Reductions

Item No.	Description	Reduction Class	Reduce FFP	Reduce Allowance	MWAA Items	Item Total
1.1	Optimize improvements in the West Falls Church Yard	VE/Scope Reduction	\$4,743	\$18,239	\$4,063	\$27,047
1.5	Wiehle Avenue bus bays	VE/Scope Reduction	\$215	\$723	\$166	\$1,104
1.6	Increase minimum ATC design Headway fro 90 seconds to 135 seconds and reduce traction power requirements	Technology/Operations Change	\$4,042	\$13,200	\$3,048	\$20,290
1.7a	Use prefabricated traction power substations	Technology/Operations Change	\$2,327	\$9,031	\$2,008	\$13,367
1.7b	Use prefabricated, pre-wired signal houses	Technology/Operations Change	\$306	\$1,028	\$236	\$1,570
1.8	Use microprocessor-based ATC system design instead of present relay logic and discrete wiring	Technology/Operations Change	\$1,402	\$1,778	\$562	\$3,740
1.9	Use LAN/WAN TCP/IP communications systems instead of present DTS technologies	Technology/Operations Change	\$117	\$1,612	\$306	\$2,035
1.10	Separate non-ATC communications systems from the ATC system	Technology/Operations Change	\$430	\$1,445	\$332	\$2,207
1.11	Eliminate provisions for a future station at Wolf Trap	VE/Scope Reduction	\$5,846	\$0	\$1,034	\$6,879
1.13	Reduce the number of maintenance vehicles and equipment	VE/Scope Reduction	\$0	\$0	\$1,809	\$1,809
1.14	Use existing parking lots during construction of the Wiehle Avenue Garage rather than building additional spaces	VE/Scope Reduction	\$400	\$1,342	\$308	\$2,049
1.16	Implementation of revisions to stations	VE/Scope Reduction	\$2,220	\$11,721	\$2,465	\$16,409
1.17	Platform canopy length adjustment	VE/Scope Reduction	\$1,689	\$5,669	\$1,301	\$8,658
1.19	PMSS contract adjustment	VE/Scope Reduction	\$0	\$0	\$27,066	\$27,066
<b>Totals</b>			<b>\$23,737</b>	<b>\$65,788</b>	<b>\$44,704</b>	<b>\$134,230</b>

Note: This table includes Cost Mitigation items which change the Total Project Cost. Cost Effectiveness Exclusion Items are therefore not included.

Optimize improvements in the West Falls Church Yard

Option 1

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
Wall		\$3,386			
ramp		\$2,340			
equipment		\$4,000			
Road Modifications		\$810			
Track		\$1,990			
ATC & TP		\$4,495			
<b>Subtotal Direct Costs</b>	<b>FFP Recovery 50%</b>	<b>Subtotal \$0</b>	<b>\$17,021</b>	<b>\$0</b>	<b>\$0</b>
Engineering Costs					
Additional Redesign		(\$650)			
FD & CM/PM	29.6%	\$5,038			
Subtotal Engineering Effort		\$4,388			
<b>Engineering Reduction (Recovery) 50.0%</b>		<b>\$2,194</b>			
Indirect Costs Reduction	6.8%	\$766			
Contingency Reduction	20.0%	\$153			
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$1,574	\$0	
<b>Overhead Recovery 50.0%</b>		<b>\$460</b>	<b>\$787</b>	<b>\$0</b>	
Fee	7.5%	\$199	\$1,395	\$0	
<b>Cost Reduction</b>		<b>\$2,853</b>	<b>\$19,203</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %		11.3%	11.3%	11.3%	2.4%
Allocated Contingency		\$322	\$2,170	\$0	\$0
Unallocated Contingency	3.3%	\$94	\$634	\$0	\$0
<b>Total Contingencies</b>		<b>\$416</b>	<b>\$2,804</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>		<b>\$3,269</b>	<b>\$22,006</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>				<b>\$25,276</b>	
Consolidated escalation	9.61%		<b>BCE</b>	<b>\$27,704</b>	

Route 7 enhancements

Line Item Description

FFP	Allowances	T&M	Real Est.	WMATA		
	\$1,560					
	\$1,300					
	\$200					
	\$5,930					
		\$19,530				
			\$35,300			
Subtotal	\$0					
Subtotal Direct Costs	<b>FFP Recovery 100%</b>	\$0	\$8,990	\$19,530	\$35,300	\$0
Engineering Costs						
Additional Redesign		\$0		\$0		
FD & CM/PM (T&M at 16.2%)	29.6%	\$2,661		\$8,882		
Subtotal Engineering Effort		\$2,661		\$8,882		
<b>Engineering Reduction (Recovery) 100.0%</b>		<b>\$2,661</b>		<b>\$8,882</b>		
Indirect Costs Reduction	6.8%	\$405		\$1,328		
Contingency Reduction	20.0%	\$81				
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$832	\$1,807		
<b>Overhead Recovery 100.0%</b>		<b>\$485</b>	<b>\$832</b>	<b>\$3,135</b>		
Fee	7.5%	\$236	\$737	\$3,088		
<b>Cost Reduction</b>		<b>\$3,382</b>	<b>\$10,558</b>	<b>\$34,635</b>	<b>\$35,300</b>	<b>\$0</b>
Allocated Contingency %		11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency		\$382	\$1,193	\$3,914	\$847	\$0
Unallocated Contingency	3.3%	\$112	\$348	\$1,143	\$1,165	\$0
<b>Total Contingencies</b>		<b>\$494</b>	<b>\$1,541</b>	<b>\$5,057</b>	<b>\$2,012</b>	<b>\$0</b>
<b>Total Cost</b>		<b>\$3,876</b>	<b>\$12,100</b>	<b>\$39,692</b>	<b>\$37,312</b>	<b>\$0</b>
<b>Total Project Cost</b>				<b>\$92,980</b>		
Consolidated escalation	9.61%		<b>BCE</b>	<b>\$101,914</b>		

Spring Hill Road improvements  
Line Item Description

			FFP	Allowances \$250 \$100	T&M	Real Est.	WMATA
					\$350		
		Subtotal	\$0				
Subtotal Direct Costs	FFP Recovery 100%		\$0	\$350	\$350	\$0	\$0
Engineering Costs							
Additional Redesign			\$0		\$0		
FD & CM/PM	29.6%		\$104		\$57		
Subtotal Engineering Effort			\$104		\$57		
<b>Engineering Reduction (Recovery) 100.0%</b>			<b>\$104</b>		<b>\$57</b>		
Indirect Costs Reduction	6.8%		\$16		\$16		
Contingency Reduction	20.0%		\$3		\$57		
WC/GL, Builder's Risk, BPOL	9.3%		\$0	\$32	\$32		
<b>Overhead Recovery 100.0%</b>			<b>\$19</b>	<b>\$32</b>	<b>\$105</b>		
Fee	7.5%		\$9	\$29	\$39		
<b>Cost Reduction</b>			<b>\$132</b>	<b>\$411</b>	<b>\$551</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %			11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency			\$15	\$46	\$62	\$0	\$0
Unallocated Contingency	3.3%		\$4	\$14	\$18	\$0	\$0
<b>Total Contingencies</b>			<b>\$19</b>	<b>\$60</b>	<b>\$80</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>			<b>\$151</b>	<b>\$471</b>	<b>\$631</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>					<b>\$1,253</b>		
		Consolidated escalation 9.61%		<b>BCE</b>	<b>\$1,374</b>		



Wiehle Avenue bus bays  
Line Item Description

		FFP	Allowances \$650	T&M	Real Est.	WMATA
	Subtotal	\$0				
Subtotal Direct Costs	FFP Recovery 50%	\$0	\$650	\$0	\$0	\$0
Engineering Costs						
Additional Redesign				\$0		
FD & CM/PM	29.6%	\$192		\$0		
Subtotal Engineering Effort		\$192		\$0		
<b>Engineering Reduction (Recovery) 50.0%</b>		<b>\$96</b>		<b>\$0</b>		
Indirect Costs Reduction	6.8%	\$29		\$0		
Contingency Reduction	20.0%	\$6		\$0		
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$60	\$0		
<b>Overhead Recovery 50.0%</b>		<b>\$18</b>	<b>\$30</b>	<b>\$0</b>		
Fee	7.5%	\$9	\$53	\$0		
<b>Cost Reduction</b>		<b>\$122</b>	<b>\$733</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %		11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency		\$14	\$83	\$0	\$0	\$0
Unallocated Contingency	3.3%	\$4	\$24	\$0	\$0	\$0
<b>Total Contingencies</b>		<b>\$18</b>	<b>\$107</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>		<b>\$140</b>	<b>\$840</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>				<b>\$981</b>		
Consolidated escalation	9.61%	BCE	\$1075			

\$0 - Dropped from consideration

Increase minimum ATC design Headway fro 90 seconds to 135 seconds and reduce traction power requirements

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
TP	1,589	7,701			
ATC					

	Subtotal	FFP Recovery	50%	Subtotal					
Subtotal Direct Costs	\$1,589			\$795	\$7,701	\$0	\$0	\$0	
Engineering Costs									
Additional Redesign	\$200								
FD & CM/PM	\$0	29.6%							
Subtotal Engineering Effort	\$200								
<b>Engineering Reduction (Recovery) 100.0%</b>	<b>\$200</b>								
Indirect Costs Reduction	\$418	6.8%							
Contingency Reduction	\$401	20.0%							
WC/GL, Builder's Risk, BPOL	\$147	9.3%			\$712	\$0			
<b>Overhead Recovery 50.0%</b>	<b>\$483</b>				\$356	\$0			
Fee	\$111	7.5%			\$631	\$0			
<b>Cost Reduction</b>	<b>\$1,589</b>				<b>\$8,688</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
Allocated Contingency %	11.3%				11.3%	11.3%	2.4%	11.3%	
Allocated Contingency	\$180				\$982	\$0	\$0	\$0	
Unallocated Contingency	\$52	3.3%			\$287	\$0	\$0	\$0	
<b>Total Contingencies</b>	<b>\$232</b>				<b>\$1,268</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
<b>Total Cost</b>	<b>\$1,820</b>				<b>\$9,957</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
<b>Total Project Cost</b>						<b>\$11,777</b>			
Consolidated escalation	9.61%				<b>BCE</b>	<b>\$12,909</b>			

Use prefabricated traction power substations

Line Item Description

materials

labor

facilities\*

FFP	Allowances	T&M	Real Est.	WMATA
0				
1,388	0			
0	4,009			

Subtotal	FFP Recovery	Subtotal	FFP	Allowances	T&M	Real Est.	WMATA
\$1,388			\$1,388				
<b>Subtotal Direct Costs</b>	<b>50%</b>		<b>\$694</b>	<b>\$4,009</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Engineering Costs							
Additional Redesign			\$350		\$0		
FD & CM/PM	20.0%				\$0		
Subtotal Engineering Effort			\$350		\$0		
<b>Engineering Reduction (Recovery) 100.0%</b>			<b>\$350</b>		<b>\$0</b>		
Indirect Costs Reduction	6.8%		\$243		\$0		
Contingency Reduction	20.0%		\$326		\$0		
WC/GL, Builder's Risk, BPOL	9.3%		\$128	\$371	\$0		
<b>Overhead Recovery 50.0%</b>			<b>\$349</b>	<b>\$185</b>	<b>\$0</b>		
Fee	7.5%		\$104	\$328	\$0		
<b>Cost Reduction</b>			<b>\$1,497</b>	<b>\$4,523</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %			11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency			\$169	\$511	\$0	\$0	\$0
Unallocated Contingency	3.3%		\$49	\$149	\$0	\$0	\$0
<b>Total Contingencies</b>			<b>\$219</b>	<b>\$660</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>			<b>\$1,716</b>	<b>\$5,183</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>					<b>\$6,899</b>		
Consolidated escalation	9.61%		<b>BCE</b>	<b>\$7,562</b>			

Use prefabricated, pre-wired signal houses  
 Line Item Description  
 labor

FFP Allowances T&M Real Est. WMATA  
 1,175 -250

Line Item Description	FFP Recovery	Subtotal	FFP	Allowances	T&M	Real Est.	WMATA
			\$1,175				
<b>Subtotal Direct Costs</b>	<b>50%</b>		<b>\$588</b>	<b>(\$250)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Engineering Costs							
Additional Redesign			\$75		\$0		
FD & CM/PM	29.6%				\$0		
Subtotal Engineering Effort			\$75		\$0		
<b>Engineering Reduction (Recovery)</b>	<b>100.0%</b>		<b>\$75</b>		<b>\$0</b>		
Indirect Costs Reduction	6.8%		\$42		\$0		
Contingency Reduction	20.0%		\$243		\$0		
WC/GL, Builder's Risk, BPOL	9.3%		\$109	(\$23)	\$0		
<b>Overhead Recovery</b>	<b>50.0%</b>		<b>\$197</b>	<b>(\$12)</b>	<b>\$0</b>		
Fee	7.5%		\$64	(\$20)	\$0		
<b>Cost Reduction</b>			<b>\$924</b>	<b>(\$282)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %			11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency			\$104	(\$32)	\$0	\$0	\$0
Unallocated Contingency	3.3%		\$30	(\$9)	\$0	\$0	\$0
<b>Total Contingencies</b>			<b>\$135</b>	<b>(\$41)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>			<b>\$1,059</b>	<b>(\$323)</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>					<b>\$735</b>		
Consolidated escalation	9.61%			<b>BCE</b>	<b>\$806</b>		



Use LAN/WAN TCP/IP communications systems instead of present DTS technologies

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
PBX	500	350			
test PBX	100	100			
Lan/Wan	-2,750	-1,100			
testL/W	-550	-550			
adjustment	2,700	1,200			
		\$0			
<b>Subtotal</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Subtotal Direct Costs</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Engineering Costs</b>					
Additional Redesign			\$0		
FD & CM/PM	29.6%		\$0		
Subtotal Engineering Effort			\$0		
<b>Engineering Reduction (Recovery) 100.0%</b>			\$0		
Indirect Costs Reduction	6.8%		\$0		
Contingency Reduction	20.0%		\$0		
WC/GL, Builder's Risk, BPOL	9.3%		\$0		
<b>Overhead Recovery 50.0%</b>			\$0		
Fee	7.5%		\$0		
<b>Cost Reduction</b>			<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %	11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency	\$0	\$0	\$0	\$0	\$0
Unallocated Contingency	3.3%	\$0	\$0	\$0	\$0
<b>Total Contingencies</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>			<b>\$0</b>		
Consolidated escalation	9.61%	<b>BCE</b>	<b>\$0</b>		

Separate non-ATC communications systems from the ATC system

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
Adjust		\$0			
Subtotal Direct Costs	Subtotal 50%	\$0	\$0	\$0	\$0
Engineering Costs	FFP Recovery	\$0	\$0	\$0	\$0
Additional Redesign		\$0	\$0	\$0	\$0
FD & CM/PM	29.6%	\$0	\$0	\$0	\$0
Subtotal Engineering Effort		\$0	\$0	\$0	\$0
<b>Engineering Reduction (Recovery) 100.0%</b>		\$0	\$0	\$0	\$0
Indirect Costs Reduction	6.8%	\$0	\$0	\$0	\$0
Contingency Reduction	20.0%	\$0	\$0	\$0	\$0
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$0	\$0	\$0
<b>Overhead Recovery 50.0%</b>		\$0	\$0	\$0	\$0
Fee	7.5%	\$0	\$0	\$0	\$0
<b>Cost Reduction</b>		\$0	\$0	\$0	\$0
Allocated Contingency %		11.3%	11.3%	11.3%	2.4%
Allocated Contingency		\$0	\$0	\$0	\$0
Unallocated Contingency	3.3%	\$0	\$0	\$0	\$0
<b>Total Contingencies</b>		\$0	\$0	\$0	\$0
<b>Total Cost</b>		\$0	\$0	\$0	\$0
<b>Total Project Cost</b>			\$0		
Consolidated escalation	9.61%	<b>BCE</b>	\$0		

Eliminate provisions for a future station at Wolf Trap		Revised per 10/16 email				
Line Item Description		FFP	Allowances	T&M	Real Est.	WMATA
Excavation and backfill		\$ 286				
Retaining walls		\$ 1,773				
Piles		\$ 2,072				
Redesign to 30% level	below	\$ -				
X-over in Bridge under Wolf Trap Flat Spot			\$ 348			

		Subtotal	\$4,131				
Subtotal Direct Costs	FFP Recovery 50%		\$2,066	\$348	\$0	\$0	\$0
Engineering Costs							
Additional Redesign			(\$100)		\$0		
FD & CM/PM	29.6%		\$714		\$0		
Subtotal Engineering Effort			\$614		\$0		
<b>Engineering Reduction (Recovery) 50.0%</b>			<b>\$307</b>		<b>\$0</b>		
Indirect Costs Reduction	6.8%		\$202		\$0		
Contingency Reduction	20.0%		\$867		\$0		
WC/GL, Builder's Risk, BPOL	9.3%		\$382	\$32	\$0		
<b>Overhead Recovery 50.0%</b>			<b>\$725</b>	<b>\$16</b>	<b>\$0</b>		
Fee	7.5%		\$232	\$28	\$0		
<b>Cost Reduction</b>			<b>\$3,330</b>	<b>\$392</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %			11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency			\$376	\$44	\$0	\$0	\$0
Unallocated Contingency	3.3%		\$110	\$13	\$0	\$0	\$0
<b>Total Contingencies</b>			<b>\$486</b>	<b>\$57</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>			<b>\$3,816</b>	<b>\$449</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>					<b>\$4,266</b>		
	Consolidated escalation 9.61%			<b>BCE</b>	<b>\$4,675</b>		

Non-recurring rolling stock cost allocation  
Line Item Description

FFP Allowances T&M Real Est. WMATA  
\$29,029

Line Item Description	Subtotal	FFP	Allowances	T&M	Real Est.	WMATA
Subtotal Direct Costs	50%	\$0	\$0	\$0	\$0	\$29,029
Engineering Costs		\$0	\$0	\$0	\$0	\$0
Additional Redesign		\$0	\$0	\$0	\$0	\$0
FD & CM/PM	29.6%	\$0	\$0	\$0	\$0	\$0
Subtotal Engineering Effort		\$0	\$0	\$0	\$0	\$0
<b>Engineering Reduction (Recovery) 50.0%</b>		\$0	\$0	\$0	\$0	\$0
Indirect Costs Reduction	6.8%	\$0	\$0	\$0	\$0	\$0
Contingency Reduction	20.0%	\$0	\$0	\$0	\$0	\$0
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$0	\$0	\$0	\$0
<b>Overhead Recovery 50.0%</b>		\$0	\$0	\$0	\$0	\$0
Fee	7.5%	\$0	\$0	\$0	\$0	\$0
<b>Cost Reduction</b>		\$0	\$0	\$0	\$0	\$29,029
Allocated Contingency %		11.3%	11.3%	11.3%	2.4%	4.6%
Allocated Contingency		\$0	\$0	\$0	\$0	\$1,347
Unallocated Contingency	3.3%	\$0	\$0	\$0	\$0	\$958
<b>Total Contingencies</b>		\$0	\$0	\$0	\$0	\$2,305
<b>Total Cost</b>		\$0	\$0	\$0	\$0	\$31,334
<b>Total Project Cost</b>				\$31,334		
Calculated in YOE	0.00%	<b>BCE</b>		<b>\$31,334</b>	\$0 Pending Phase 2	

Reduce the number of maintenance vehicles and equipment  
 Line Item Description

FFP Allowances T&M Real Est. WMATA  
 \$1,500  
 \$225

Line Item Description	Subtotal	FFP	Allowances	T&M	Real Est.	WMATA
Subtotal Direct Costs	50%	\$0	\$0	\$0	\$0	\$1,725
Engineering Costs						
Additional Redesign						
FD & CM/PM	29.6%	\$0		\$0		
Subtotal Engineering Effort		\$0		\$0		
<b>Engineering Reduction (Recovery) 50.0%</b>		\$0		\$0		
Indirect Costs Reduction	6.8%	\$0		\$0		
Contingency Reduction	20.0%	\$0		\$0		
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$0	\$0		
<b>Overhead Recovery 50.0%</b>		\$0	\$0	\$0		
Fee	7.5%	\$0	\$0	\$0		
<b>Cost Reduction</b>		\$0	\$0	\$0	\$0	\$1,725
Allocated Contingency %		11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency		\$0	\$0	\$0	\$0	\$0
Unallocated Contingency	3.3%	\$0	\$0	\$0	\$0	\$57
<b>Total Contingencies</b>		\$0	\$0	\$0	\$0	\$57
<b>Total Cost</b>		\$0	\$0	\$0	\$0	\$1,782
<b>Total Project Cost</b>				\$1,782		
Consolidated escalation	9.61%		<b>BCE</b>	<b>\$1,953</b>		

Use existing parking lots during construction of the Wiehle Avenue Garage rather than building additional spaces

Line Item Description FFP Allowances T&M Real Est. WMATA  
 Allo \$1,207

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
Subtotal	\$0				
Subtotal Direct Costs	\$0	\$1,207	\$0	\$0	\$0
Engineering Costs					
Additional Redesign	\$0		\$0		
FD & CM/PM	29.6%	\$357	\$0		
Subtotal Engineering Effort		\$357	\$0		
<b>Engineering Reduction (Recovery) 50.0%</b>		<b>\$179</b>	<b>\$0</b>		
Indirect Costs Reduction	6.8%	\$54	\$0		
Contingency Reduction	20.0%	\$11	\$0		
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$112	\$0	
<b>Overhead Recovery 50.0%</b>		<b>\$33</b>	<b>\$56</b>	<b>\$0</b>	
Fee	7.5%	\$16	\$99	\$0	
<b>Cost Reduction</b>		<b>\$227</b>	<b>\$1,362</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %	11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency		\$26	\$154	\$0	\$0
Unallocated Contingency	3.3%	\$7	\$45	\$0	\$0
<b>Total Contingencies</b>		<b>\$33</b>	<b>\$199</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>		<b>\$260</b>	<b>\$1,561</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>			<b>\$1,821</b>		
Consolidated escalation	9.61%	<b>BCE</b>	<b>\$1,996</b>		



Implementation of revisions to stations  
Line Item Description

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
		\$1,100			
		\$1,330			
		\$2,200			
		\$3,330			
		\$1,950			
		\$460			
		\$0			
		\$175			
	Subtotal	\$0			
Subtotal Direct Costs	FFP Recovery 50%	\$0	\$10,545	\$0	\$0
Engineering Costs					
Additional Redesign		\$875			
FD & CM/PM	29.6%	\$3,121			
Subtotal Engineering Effort		\$3,996			
<b>Engineering Reduction (Recovery) 50.0%</b>		<b>\$1,998</b>			
Indirect Costs Reduction	6.8%	\$475			
Contingency Reduction	20.0%	\$95			
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$975		
<b>Overhead Recovery 50.0%</b>		<b>\$285</b>	\$488		
Fee	7.5%	\$171	\$864		
<b>Cost Reduction</b>		<b>\$2,454</b>	<b>\$11,897</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %		11.3%	11.3%	11.3%	2.4%
Allocated Contingency		\$277	\$1,344	\$0	\$0
Unallocated Contingency	3.3%	\$81	\$393	\$0	\$0
<b>Total Contingencies</b>		<b>\$358</b>	<b>\$1,737</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>		<b>\$2,812</b>	<b>\$13,634</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>				<b>\$16,446</b>	
Consolidated escalation	9.61%	<b>BCE</b>	<b>\$18,026</b>		

Platform canopy length adjustment  
Line Item Description

	FFP	Allowances \$5,100	T&M	Real Est.	WMATA
Subtotal Direct Costs					
<b>FFP Recovery 50%</b>	\$0	\$5,100	\$0	\$0	\$0
Engineering Costs					
Additional Redesign	\$0		\$0		
FD & CM/PM			\$0		
Subtotal Engineering Effort	29.6%	\$1,510	\$0		
<b>Engineering Reduction (Recovery) 50.0%</b>		\$755	\$0		
Indirect Costs Reduction	6.8%	\$230	\$0		
Contingency Reduction	20.0%	\$46	\$0		
WC/GL, Builder's Risk, BPOL	9.3%	\$0	\$472		
<b>Overhead Recovery 50.0%</b>		\$138	\$236		
Fee	7.5%	\$67	\$418		
<b>Cost Reduction</b>		<b>\$959</b>	<b>\$5,754</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %	11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency		\$108	\$650	\$0	\$0
Unallocated Contingency	3.3%	\$32	\$190	\$0	\$0
<b>Total Contingencies</b>		<b>\$140</b>	<b>\$840</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>		<b>\$1,100</b>	<b>\$6,594</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>			<b>\$7,693</b>		
Consolidated escalation	9.61%	<b>BCE</b>	<b>\$8,433</b>		

Emergency crossovers on the DIAAH

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
X-over under Aerial Guideway		\$48			
X-over gates between DIAAH & DTR		\$1,530			
X-over ramps @ Beulah Bridge		\$1,131			

	Subtotal	FFP Recovery	100%	\$0	\$2,709	\$0	\$0	\$0
Subtotal Direct Costs				\$0		\$0		
Engineering Costs								
Additional Redesign				\$0		\$0		
FD & CM/PM	29.6%			\$802		\$0		
Subtotal Engineering Effort				\$802		\$0		
<b>Engineering Reduction (Recovery) 100.0%</b>				<b>\$802</b>		<b>\$0</b>		
Indirect Costs Reduction	6.8%			\$122		\$0		
Contingency Reduction	20.0%			\$24		\$0		
WC/GL, Builder's Risk, BPOL	9.3%			\$0	\$251	\$0		
<b>Overhead Recovery 100.0%</b>				<b>\$146</b>	\$251	\$0		
Fee	7.5%			\$71	\$222	\$0		
<b>Cost Reduction</b>				<b>\$1,019</b>	<b>\$3,182</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Allocated Contingency %				11.3%	11.3%	11.3%	2.4%	11.3%
Allocated Contingency				\$115	\$360	\$0	\$0	\$0
Unallocated Contingency	3.3%			\$34	\$105	\$0	\$0	\$0
<b>Total Contingencies</b>				<b>\$149</b>	<b>\$465</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Cost</b>				<b>\$1,168</b>	<b>\$3,646</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Project Cost</b>						<b>\$4,814</b>		
Consolidated escalation	9.61%				<b>BCE</b>	<b>\$5,277</b>		

PMSS contract adjustment  
Line Item Description

Line Item Description	FFP	Allowances	T&M	Real Est.	WMATA
69000					
23000					
92000					
20%					\$18,400
<b>Subtotal</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$18,400</b>
<b>Subtotal Direct Costs FFP Recovery 50%</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$18,400</b>
Engineering Costs					
Additional Redesign					
FD & CM/PM 29.6%	\$0		\$0		
Subtotal Engineering Effort	\$0		\$0		
<b>Engineering Reduction (Recovery) 50.0%</b>	<b>\$0</b>		<b>\$0</b>		
Indirect Costs Reduction 6.8%	\$0		\$0		
Contingency Reduction 20.0%	\$0		\$0		
WC/GL, Builder's Risk, BPOL 9.3%	\$0	\$0	\$0		
<b>Overhead Recovery 50.0%</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>		
Fee 7.5%	\$0	\$0	\$0		
<b>Cost Reduction</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$18,400</b>
Allocated Contingency %	11.3%	11.3%	11.3%	2.4%	0.0%
Allocated Contingency	\$0	\$0	\$0	\$0	\$0
Unallocated Contingency 3.3%	\$0	\$0	\$0	\$0	\$607
<b>Total Contingencies</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$607</b>
<b>Total Cost</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$19,007</b>
<b>Total Project Cost</b>			<b>\$19,007</b>		
Calculated in YOE 0.00%	<b>BCE</b>	<b>\$19,007</b>			\$0 pending Phase 2