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Metropolitan Transportation Authority

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**REVISED**  
**SYSTEM SAFETY, SECURITY AND OPERATIONS COMMITTEE**  
**NOVEMBER 6, 2014**

**SUBJECT: HEAVY RAIL VEHICLE PROCUREMENT**

**ACTION: AUTHORIZE REQUEST FOR PROPOSAL - SOLICITATION OF NEW HEAVY RAIL VEHICLES (HRV)**

**RECOMMENDATION**

- A. Authorize staff to issue a Best Value federally funded solicitation for a new Heavy Rail Vehicle (HRV) procurement. The new HRVs are required to meet the revenue service requirements and enhanced service capacity for the Westside Purple Line Extension (PLE), as specified in the 30/10 Initiative, as well as address state of good repair issues with the existing Red/Purple Line fleet.
- B. Approve re-program of funding to direct \$120 million of previously planned Heavy Rail Vehicle Mid-Life Refurbishment (CP 206038) to the Heavy Rail Vehicle Procurement (CP 206037) project to replace 30 existing Red/Purple Line vehicles in lieu of performing a mid-life overhaul on the oldest existing vehicles. The \$52 million remaining in CP 206038 will be used for Rail Vehicle component refurbishments.

**ISSUE**

In July 2014, the Board authorized the Chief Executive Officer (CEO) to solicit Best Value Requests for Proposals (RFPs) using a competitive negotiation method to procure new HRVs. Various issues were considered when developing an approach to issuing this solicitation. Staff determined that the first priority is to move forward with purchasing 34 PLE Segment 1 vehicles and replace the oldest 30 vehicles in the existing HRV fleet rather than perform a mid-life refurbishment on these 30 vehicles.

It should be noted that the remaining \$52 million in CP 206038 – Heavy Rail Vehicle Mid-Life will be used to perform strategic component replacements to maintain the vehicles in a “State of Good Repair.”

**DISCUSSION**

Various operational issues were considered when developing an approach to issuing this solicitation. The issues include rail expansion, midlife/replacement of the existing

HRV fleet, and other improvements to enhance service and augment the customer experience.

Metro is currently expanding rail network and services, including extending the Purple Subway Line. The Westside Purple Line Extension, previously named the Westside Subway Extension, extends service from the terminus at Wilshire/Vermont Station to Westwood (UCLA and Veteran's Administration Hospital). This extension, consisting of nearly nine miles of track and seven stations, is planned to be constructed in three segments.

Thirty four vehicles are required to operate Segment 1. Given the preliminary Revenue Operations Date (ROD) of 2023, Staff recommends that the solicitation include these 34 vehicles as part of the Base Order.

#### Midlife/Replacement of the Existing Fleet:

The existing Red/Purple Line fleet (AE650 vehicles) consists of 104 vehicles. These vehicles were accepted by Metro in 1992 and 1993. The vehicles were delivered in two intervals; a Base Buy of 30 vehicles and an Option Buy of 74 vehicles. Based on a 30-year useful life, the Base Buy vehicles are scheduled for retirement in 2022/2023 and the Option vehicles in 2027 through 2029. Staff estimates that it will cost more than \$3.1 million to perform a midlife on each vehicle. An analysis of FY13 and FY14 actual Operating expenditures associated with AE650 vehicle maintenance, shows that the Base Buy vehicles cost an additional 85 percent per mile to maintain (Base Buy vehicles cost \$1.61 per mile; Option vehicles cost \$0.87 per mile). Given the 30 Base Buy vehicles are close to retirement age, Staff recommends replacing the 30 Base Buy vehicles as part of the Base Order solicitation.

Given the projected retirement year of the AE650 Option vehicles in 2027 and 2029, Staff recommends performing less expensive and less aggressive component-level overhauls on the 74 AE650 Option vehicles in order to maintain a "State of Good Repair."

Staff recommends that the 34 vehicles to operate PLE Segment 1 and the replacement of the 30 AE650 Base Buy vehicles (64 total) make up the HRV Base Buy. Staff also recommends that vehicles needed for PLE Segment 2 and 3, and replacement of the AE650 Option vehicles be solicited as Option Buys.

#### Enhancing the Customer Experience

Another area of expanded service requirements studied is related to reduced headways and overcrowding. Expanded operation of base service is needed to address these issues. Staff recommends implementing six-car consists at four minute headways during peak periods. It is estimated that procurement of an additional 112 vehicles is necessary to address this requirement. Staff recommends that these vehicles also be included as Option Buys.

To provide the most flexibility while ensuring HRVs are delivered when needed, the Base and Option Order quantities are summarized as follows:

**Base Order:**

Westside Purple Line Extension, Segment 1	34 HRVs
<u>Replacement of 30 Base Buy A650 HRVs</u>	<u>30 HRVs</u>
Total Base Order	64 HRVs

**Option Orders:**

Option 1: Expanded Base Operation	112 HRVs
Option 2: Purple Line Extension (PLE) Segment 2	20 HRVs
Option 3: Purple Line Extension (PLE) Segment 3	12 HRVs
<u>Option 4: Replacement of 74 Option Buy A650 HRVs</u>	<u>74 HRVs</u>
Total Contract Options	218 HRVs

The planned solicitation outlines a very preliminary vehicle delivery schedule as shown below. This schedule will be revised as the RFP process progresses.

	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28 - FY30	
<b>Base Order</b>											
PLE Segment 1	20	14	-	-	-	-	-	-	-	-	34
A650 BB Repl.	-	10	20	-	-	-	-	-	-	-	30
	20	24	20	-	-	-	-	-	-	-	64
<b>Option Orders</b>											
Base Expansion	-	-	6	24	24	24	24	10	-	-	112
PLE Segment 2	-	-	-	-	-	14	6	-	-	-	20
PLE Segment 3	-	-	-	-	-	-	-	-	12	-	12
A650 Option Repl.	-	-	-	-	-	-	-	-	6	68	74
	-	-	6	24	24	38	30	10	18	68	218
<b>Total</b>	<u>20</u>	<u>24</u>	<u>26</u>	<u>24</u>	<u>24</u>	<u>38</u>	<u>30</u>	<u>10</u>	<u>18</u>	<u>68</u>	<u>282</u>

This schedule ensures a uninterrupted vehicle production schedule that should result in cost savings by avoiding re-tooling costs associated with gaps in vehicle production. This approach will also permit staff to proceed with the Base Order procurement now and to allow for the execution of the Option Orders once funding is secured.

## **DETERMINATION OF SAFETY IMPACT**

The approval of this capital project will have a direct and positive impact to system safety, service quality, system reliability and overall customer satisfaction. The procurement of sixty-four (64) new HRVs will support the operational needs of Segment 1 of the PLE and augment service levels by replacing the underperforming thirty (30) Base Buy A650 HRVs. The approval of this capital project will also permit Metro to maintain a "State of Good Repair" on the remaining seventy-four (74) Option Buy A650 HRVs.

## **FINANCIAL IMPACT**

Funding to initiate the 64 HRV Base Order and perform component level overhauls on the 74 A650 Option vehicles is summarized below:

### **64 HRV Base Order**

PLE Segment 1 (34 vehicles): \$160 million is budgeted in the capital LOP budget of project 865518 – Westside Subway Extension and is included in the Full Funding Grant Agreement.

A650 Base Vehicle Replacement (30 Vehicles): The capital LOP budget for project 206038 – Heavy Rail Vehicle Midlife is currently \$172 million. \$120M will be transferred in to the LOP budget of project 206037 – Heavy Rail Vehicle Procurement, and the LOP will be increased to \$291 million to complete the base purchase of the 64 vehicles required for PLE Segment 1 and A650 Base Buy vehicle replacement.

After transfer of \$120M from the LOP budget of 206038 – Heavy Rail Vehicle Midlife, to 206037 – Heavy Rail Vehicle Procurement, an LOP of \$52M will remain in project 206038 to perform component level overhauls.

### **HRV Option Orders**

Funding for the four Option Orders will be determined as funds become available and presented to the Board upon exercising of each Option.

Since this is a multi-year contract/project, the cost center manager, Project Manager, and General Manager will ensure that costs will be budgeted in future years, including any option(s) exercised.

### **Impact to Budget**

The current source of funds for the Base Order and component level overhauls is Measure R Rail Capital 2%, Measure R New Rail Capital 35%, and Federal Section 5309 New Starts. Staff will pursue additional federal funds that may become available through MAP-21 or other federal sources for this project to maximize and conserve the

use of local funding sources before considering debt financing. These funding sources are not eligible for Bus and Rail transit operation.

### **ALTERNATIVES CONSIDERED**

Focusing on the existing HRV fleet, Metro staff considered a full refurbishment program for the aging thirty (30) Base Buy and seventy-four (74) Option Buy A650 HRVs. Specifically, the thirty (30) Base Buy A650 HRVs would require a full replacement of the Propulsion system from the Electronic Controls equipment to the DC Motors (i.e., Traction Motors, HVAC Blower Motors and Equipment Cooling Blower Motors) in order to modernize these systems. However, this alternative is not recommended as the Base Buy A650 HRVs would require an extensive refurbishment program of other systems in order for it to be fully compatible with the Option Buy A650 HRVs due to an obsolete design and control differences. Given the extensive scope of work and high operating cost, it is not cost effective to perform a mid-life given the age of these HRVs and how close the Base Buy cars are to the end of their service life.

This option was not pursued as it would address only existing fleet reliability issues, reduce the number of Vehicles available for revenue service due to Vehicles being out for refurbishment, and it would not address future service expansion needs.

### **NEXT STEPS**

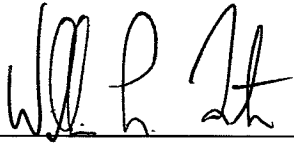
Upon Board approval, Metro staff would finalize the Specifications for the scope of work, initiate and issue the competitively negotiated Best Value solicitation procurement, and issue a Notice-to-Proceed.

### **ATTACHMENT**

#### **A. Capital Project Funding & Expenditure Plan**

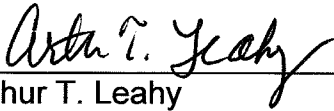
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213-922-4808



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William L. Foster  
Interim Chief Operations Officer



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Arthur T. Leahy  
Chief Executive Officer

ATTACHMENT A

CP 206037 HR4000 HEAVY RAIL VEHICLE (HRV) PROCUREMENT  
CAPITAL PROJECT FUNDING & EXPENDITURE PLAN

Use of Funds	7/1/14 - 6/30/15	7/1/15 - 6/30/16	7/1/16 - 6/30/17	7/1/17 - 6/30/18	7/1/18 - 6/30/19	7/1/19 - 6/30/20	7/1/20 - 6/30/21	Total	% of Project
	FY15	FY16	FY17	FY18	FY19	FY20	FY21		
Base Order: 64 Vehicles	\$0	\$0	\$1,000,000	\$1,560,000	\$105,000,000	\$110,000,000	\$16,169,000	\$233,729,000	80.3%
Professional Services	\$1,392,000	\$900,000	\$3,500,000	\$4,000,000	\$4,500,000	\$4,600,000	\$3,560,000	\$23,371,000	8.0%
MTA Travel	\$25,000	\$36,000	\$50,000	\$85,000	\$85,000	\$39,000	\$15,000	\$335,000	0.1%
MTA Administration	\$0	\$816,600	\$1,226,000	\$1,256,000	\$1,312,000	\$1,236,000	\$1,264,000	\$7,110,600	2.4%
Contingency							\$26,454,560	\$26,454,560	9.1%
Base Order Total	\$1,417,000	\$1,752,600	\$5,776,000	\$6,901,000	\$110,897,000	\$115,875,000	\$47,462,560	\$291,000,160	100%

\*\* Staff will pursue additional federal funds that may become available through MAP-21 or other federal sources for this project to maximize availability of local fund sources. Staff will also substitute non-federal funds as they become available to meet project requirements.