



## Board Report

File #: 2024-0511, File Type: Contract

Agenda Number: 25.

### OPERATIONS, SAFETY, AND CUSTOMER EXPERIENCE COMMITTEE NOVEMBER 21, 2024

**SUBJECT: LIFE OF PROJECT INCREASE FOR P2000 LIGHT RAIL VEHICLE  
MODERNIZATION/OVERHAUL PROJECT**

**ACTION: APPROVE RECOMMENDATION**

#### **RECOMMENDATION**

INCREASE the Life of Project (LOP) budget for the P2000 Light Rail Vehicle (LRV) Midlife Modernization Project, Capital Project (CP) 206044, by \$20,053,926.00, increasing the total LOP budget from \$160,800,000.00 to \$180,853,926.00.

#### **ISSUE**

Contract No. OPP2000 directs Alstom Transportation Inc. to perform midlife modernization and replace critical components, including propulsion, brake, and train control systems on the 52 Siemens vehicles (P2000) to ensure they remain in a state of good repair through their intended design life. The existing LOP budget is insufficient to fund the negotiated and pending change orders required to complete the project, including potential claims still under discussion. The change orders are necessary for two reasons:

- 1) to mitigate external factors, including project extension approval due to various delays; and
- 2) address newly identified technical issues that emerged during the contract and require additional work that was not included in the original project scope

#### **BACKGROUND**

The P2000 LRVs were first put in revenue service back in July of 2000. The Midlife Modernization Project is essential based on the Original Equipment Manufacturer's (OEM) repair recommendation and per vehicle performance record assessment. The contract was awarded to Alstom Transportation at the March 2017 Board meeting. The Midlife Modernization Project is required by the Rail Fleet Management Plan FY2015-FY2040 which details Metro's forecasted rail services to ensure that the P2000 fleet is maintained in a state of good repair to support current and future ridership projections. The midlife modernization scopes include upgrade/renewal of the propulsion system, key brake system components, HVAC system, Electrical system, Communication system, Automatic Train Control System, and various other sub-systems to ensure the vehicles can continue to operate safely and to ensure their reliability and maintainability.

During the solicitation phase, the project team and contractors performed assessments of the P2000 fleet as thoroughly as possible without disassembling equipment. All interested parties received available documentation regarding the fleet configuration. However, some technical issues impacting performance were identified only after the vehicles were disassembled or when attempting to integrate new systems. Changes to the work scope were required to address the newly identified issues. The P-signal generator and dead battery start modules are two examples of previously unidentified obsolete components that required replacement to meet performance and reliability requirements. For such identified technical issues, change orders were executed to address them in a timely manner; more details are provided in the Discussion Section below.

Currently, the project is near 94% completion on production and only has three LRVs remaining for commissioning. However, the 49 modernized LRVs that are currently conditionally accepted are still under warranty phase which is expected to conclude in June of 2028.

## **DISCUSSION**

Since the contract award of this project, change orders have been issued to address newly identified obsolescent components and systems impacting performance. Issuing change orders has helped to ensure the delivered LRVs are reliable and available for service.

The change orders are attributed to increased costs and COVID-related factors beyond Metro and Alstom's control. Additionally, these change orders addressed unforeseen technical issues that were out of the original project scope. The COVID pandemic adversely impacted critical travel for design review meetings with the contractor and key suppliers, witnessing critical tests, and supporting critical inspections. Additionally, the pandemic severely impacted the global supply chain and workforce availability. These COVID-related challenges resulted in numerous activities taking longer than originally planned and requiring additional contractor, Metro, and consultant resources to complete this project. This resulted in increases in project costs.

By resolving these issues, the change orders ensure that the P2000 LRVs are restored to a state of good repair and will be maintained at this standard for the remainder of their design life. Here are some of the change orders mentioned previously:

- 1) Since the P2000 LRVs been put in services starting year 2000, numerous configuration changes including wiring, reworks, and parts replacements were done by Operations. Hence, the P2000 LRVs are not in a consistent vehicle configuration per original design drawings, which required additional work to bring them up to the latest configuration. This is crucial so that the fleet is consistent and easier for future maintenance activities.
- 2) gsame reasons as in Point 1 aboveDoor issues - The contractor claims that door issues resulted from latent defects and were outside their work scope.
- 3) Time Impact Analysis 4 - Increase testing hours and scope from 1 LRV to 2 LRVs.
- 4) Time Impact Analysis 5 - No track access or any test cancelation that may affect the capability to perform the Validation &Verification (V&V) and Commissioning & Warranty activities

---

(validation test campaign, 4K Burn-in test, and 1k Burn-in test) that will drive the whole chain of events of Conditional Acceptance of each LRV.

- 5) Time Impact Analysis 9 - Performing the 1000-mile burn-in test in the first three LRVs after the 4000-mile test.

The current budget for the P2000 LRV Midlife Modernization Project will be exceeded due to the several unforeseen factors mentioned earlier that were not initially anticipated. Currently, there are only 7.2% (approximately \$11.5M) LOP remaining. With the additional required changes (see above five items), the project still requires \$20.05M to successfully complete the remaining tasks.

This funding is vital for advancing the integration process and ensuring that the P2000 systems are seamlessly incorporated into Regional Connector operations. Additionally, it will support the implementation of critical reliability improvements, address evolving operational demands, and maintain performance standards.

### **DETERMINATION OF SAFETY IMPACT**

Approval of this recommendation will positively impact safety, service quality, system reliability, performance, and overall customer satisfaction. A properly functioning LRV is required to safely operate Metro's rail service. Failing to approve this recommendation will have significant safety risks that severely impact the LRV's operational efficiency and long-term maintainability.

### **FINANCIAL IMPACT**

Upon Board approval, the project LOP will be increased from \$160,800,000 to \$180,853,926 under CP 206044. The FY25 annual budget for this project is \$8,831,452, with an available LOP of \$19,717,618. The requested increase also includes an allocation for Project Contingencies, as detailed in Attachment A - Funding Expenditure Plan. This contingency allocation will enable staff to address any additional issues identified as we approach Contract Closeout.

Since this is a multi-year project, the Program Manager will ensure that this project is budgeted in future fiscal years.

#### **Impact to Budget**

The current budget for this action includes Proposition A, Measure M, and Federal 5337. These funds are eligible for rail operating and capital projects. Using these funding sources maximizes the allocation intent given fund guidelines and provisions.

### **EQUITY PLATFORM**

The P2000 LRV Midlife Modernization/Overhaul Project enables the successful delivery of these vehicles on Metro's existing light rail vehicle lines, such as the A and E lines. These lines serve many Equity Focus Communities (EFCs), such as Downtown LA, Chinatown, Long Beach, and others. . Having safe, reliable LRVs provides options to EFCs, which often rely on public transit to seamlessly commute to work, school, and other opportunities.

## **IMPLEMENTATION OF STRATEGIC PLAN GOALS**

The recommendation supports Strategic Plan Goal #1.2 - Optimize the existing system's speed, reliability, and performance by revitalizing and upgrading Metro's transit assets. The completion and rollout of the P2000 LRVs are state-of-the-art assets that will significantly reduce trip disruptions on rail networks and improve the integrity of the overall network.

This goal is to ensure effective management of the increased budget with a focus on reliability enhancements. In addition, we have developed a forecast budget to monitor expenditures closely.

## **ALTERNATIVES CONSIDERED**

The Board of Directors may choose not to approve the requested increase in LOP for this project. However, Metro staff do not recommend this alternative because it will impact the ability to complete the necessary modernization/overhaul for a reliable fleet. Staff explored all possible mitigation efforts, including considering performing some work in-house and allocating other funds/reserves to the project. However, the amount needed to complete the remaining works will still require board approval for additional LOP. The budget increase is not merely a financial adjustment but a strategic necessity to ensure the fleet's reliability and alignment with Metro agency expectations.

## **NEXT STEPS**

Metro will continue crucial work on the P2000 integration with the Regional Connector and implement the necessary changes to enhance system reliability. This funding is vital for advancing the integration process, ensuring that the P2000 systems are seamlessly incorporated into the Regional Connector operations. Additionally, it will support the implementation of critical reliability improvements, addressing evolving operational demands and maintaining performance standards.

## **ATTACHMENTS**

Attachment A - Funding and Expenditure Plan

Prepared by: Eduardo Maycotte, Senior Manager, Project Control (213) 922-3376  
Annie Yang, Deputy Executive Officer, Rail Vehicle Acquisitions (213) 922-3254  
Jesus Montes, Senior Executive Officer, Vehicle Acquisitions (213) 418-3277  
Debra Avila, Deputy Chief Vendor/Contract Management Officer, (213) 418-3051

Reviewed by: Conan Cheung, Chief Operations Officer, (213) 418-3034



Stephanie N. Wiggins  
Chief Executive Officer