



Board Report

File #: 2021-0723, File Type: Contract

Agenda Number: 20.

OPERATIONS, SAFETY, AND CUSTOMER EXPERIENCE COMMITTEE MARCH 17, 2022

SUBJECT: EXECUTE CONTRACT MODIFICATION WITH BYD FOR VEHICLE TELEMATICS AND CHARGE MANAGEMENT SYSTEM, AND K9MD-ER EXTENDED RANGE BUSES

ACTION: APPROVE RECOMMENDATIONS

RECOMMENDATION

AUTHORIZE the Chief Executive Officer to:

- A. INCREASE the Life of Project (LOP) budget by \$34,551,702, raising the LOP budget to \$163,534,000;
- B. EXECUTE Modification No. 11 to BYD Coach & Bus, LLC (BYD), to provide Vehicle Telematics and Charge Management System software to assist Metro in lowering operational costs and developing custom software to manage the Silver Line electric buses at Division 9 and Division 18 more efficiently, at the firm fixed price of \$2,944,274; and upgrade ninety-five (95) buses from a K9M model to a K9MD-ER extended range model increasing the battery size from 348kWh to a 496 kWh, at a firm fixed price of \$15,025,340; for a combined modification total of \$17,969,614, increasing the contract value from \$102,620,864 to \$120,590,478 (excluding CMA); and
- C. INCREASE Contract Modification Authority by \$12,970,951 to incorporate the Charge Management System and Extended Range Bus upgrade, and includes an additional 10% or \$1,796,961 for future vehicle configuration changes.

ISSUE

In July 2017, Metro's Board of Directors approved a motion to convert the Metro G Line to full Zero Emission operation by 2020 and thereafter the Metro J Line as soon as feasible. On February 17, 2022, a motion was passed directing the CEO to provide a change order allowing for extended range buses for the J Line (Attachment A).

The successful transition of J Line operations from CNG to Battery Electric Buses (BEB) in a technically & fiscally responsible manner requires addressing challenges with BEB Performance and limited charging opportunities. To mitigate these challenges, it is recommended to adopt an extended range electric bus configuration and a load & charge management system to make efficient & effective use of the charging infrastructure.

Approval of staff's recommendations is necessary to support the transition of J Line Service from CNG to Zero Emissions Bus operations.

BACKGROUND

In July 2017 the Metro Board approved a motion to convert the J Line to full Zero Emission operation as soon as feasible following the conversion of the G Line. Metro is currently in the process of upgrading the electric utilities at Division 9 (D9) and the adjacent El Monte Transit Center / Busway to support the anticipated service with BYD's BEB's.

Vehicle Telematics and Charging Management System

To optimize the use of the planned charging infrastructure with predicted BEB performance, control software is needed to provide:

- 1) Real-time status information from the buses and charging equipment;
- 2) Charge management to optimize the charging strategies to maximize bus availability for service while minimizing peak and demand charges; and
- 3) Bus dispatch management to ensure buses are matched to the most optimum routes given bus's state of charge.

Having a centralized control software package to manage BEB's and chargers from multiple vendors and with different performance characteristics is critical to optimize charging strategies, maximize bus availability for service, and allow for operational flexibility.

K9MD-Extended Range (ER)

Originally, Metro's intent was to service the J Line with BYD's 348-kWhr K9M buses, dispatched from D9. However, computer modeling suggests the buses applied on the longer J Line routes may realize unacceptable low levels of charge. On-going tests with the Pilot K9M buses appear to partially mitigate this concern; however, testing under all possible adverse operating conditions remains to be completed.

In parallel, since the contract was first awarded, BYD was able to increase the battery capacity on their K9 40-ft Bus Series, under the K9MD-ER model. In addition to an added 22% battery capacity, it is also capable of being charged at faster rate. A ten (10) minute charge at a layover will add 27 miles of range to a K9MD-ER vs. 19 miles to a K9M.

The proposed configuration, with increased battery capacity and higher charge rate, will improve the ability of the buses to meet the rigorous service needs of the Metro J Line, and allow for additional routes to be supported with BEB's from Divisions 9 and 18.

DISCUSSION

Findings

Given the technical challenges with significant capital and operational costs associated with transitioning to Zero Emissions Bus operations, control software is required to minimize the amount of charging infrastructure that needs to be installed, optimize the charging strategies, and effectively dispatch the buses. Additionally, bus range should be maximized to reduce the need for charging infrastructure.

- **The Vehicle Telematics and Charge Management software** - This software will help Metro lower the operational cost of the electric buses by managing when, where and how these buses are charged. In addition, the contractor will be developing a custom software (Smart Dispatching) to manage the J Line Buses at Division 9 and Division 18.
- **Battery Range** -. The "K9MD-ER" battery capacity will be 22% larger than the K9M. The Range of the K9M in comparison to the K9MD-ER its approximately 150 miles vs 200 miles, respectively.
- **Battery's Charge Acceptance** - Charge Acceptance directly translates to how much energy a battery will accept in a given amount of time. The higher the acceptance translates to the more energy the batteries will accept. Increasing the Charge Acceptance along the J Line with opportunity chargers at El Monte Station and Harbor Gateway Transit Center will improve the ZEB's ability to meet the service needs of the J Line. The K9MD-ER charge rate is 400 kWhr and the K9M's is 300 kWhr. For Example, charging both the K9M and the K9MD- ER for 10 minutes will add 19 miles and 27 miles respectively.

Staff shall administer recommendation B to modify the cumulative CMA as required to execute Modification 11 and provide the cumulative 10% allowance as noted.

Considerations

It is staff's recommendation to issue BYD a contract modification to develop and implement the vehicle telematics and charging management system as well as the executing the Contract Modification for the K9MD-ER.

DETERMINATION OF SAFETY IMPACT

There is no impact to safety. Recommendations B-C will allow Metro to efficiently manage the BEB fleet telematics and charging system while the K9MD-ER will provide extended range for the BYD BEB fleet.

FINANCIAL IMPACT

Upon approval of recommendation A, the LOP budget for project 201077 (40 Foot ZEB: BYD) will be increased by \$34,551,702 to \$163,534,000. Since this is a multi-year contract and project, the Project Manager, Cost Center Manager and Chief Operations Officer will be responsible for budgeting the costs in future years.

Impact to Budget

Approval of this action will increase the project LOP to \$163,534,000. Staff will fund this FY project budget increase using available existing FY22 funds from other Bus Acquisition Capital projects. As a result, this will be a net zero FY22 budget impact to the Bus Acquisitions program. The combined funding for these actions include Federal, State and Local funding sources including Green Funds. Staff will continue to pursue traditional funding sources such as LCTOP and Federal 5307 for this electrification effort. Lastly, staff will continue to pursue all grant and rebate opportunities as they materialize.

EQUITY PLATFORM

The J Line provides bus services to Equity Focused Communities (EFC's) from El Monte Station to Downtown Los Angeles to Harbor Gateway Transit Center. The J Line runs through the 10 and 110 Freeways along a dedicated BRT lane and serves the following ridership (Fall 2019 Silver Line Rider Survey):

- 48% below \$25K household income (42.5% below poverty line)
- 68.3% had no car available
- 74% use transit 5+ days a week
- Rider Ethnicity: Latino 58.3%; Black 15.2%; White 10.6%; Asian/Pacific Islander 9.8%; Other 6.1%

It is recognized that BEBs provide improved air quality and quieter services compared to current Renewable Natural Gas (RNG) bus fleet.. However, RNG compared to BEB ranges are not at the point where 1 for 1 service replacement can be provided without increasing risks to the quality of service. Staff will provide options for further electrified J Line services as BEB range performance is improved and/or additional charging infrastructure installations are completed. SBE and DVBE requirements from the contract remain unchanged with this change order.

IMPLEMENTATION OF STRATEGIC PLAN GOALS

These recommendations support Goal #3, Enhance communities and lives through mobility and access to opportunity and Goal #4 Transform LA County through regional collaboration and national leadership.

ALTERNATIVES CONSIDERED

Staff has considered retaining the BEBs configuration as per the original contract. However, there are significant performance benefits that are now available resulting from technological evolution that can improve service quality and reliability and providing a seamless ride from El Monte Station to San Pedro with these recommendations.

The Board of Directors may choose not to authorize the Contract Modification for this project; however, this alternative is not recommended as this could impact the J Line meeting the service

needs and lowering ridership, and or increasing operation costs.

NEXT STEPS

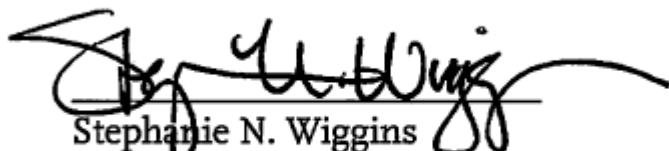
Upon Board approval, staff will execute the Contract Modifications to implement the charge management system and upgrade the vehicle configuration to the K9MD-ER.

ATTACHMENTS

- Attachment A - Motion 25
- Attachment B - Procurement Summary
- Attachment C - DEOD Summary
- Attachment D - Contract Modification Log
- Attachment E - Funding and Expenditure Plan

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