Los Angeles County
Metropolitan Transportation
Authority
One Gateway Plaza
3rd Floor Board Room
Los Angeles, CA

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

Prepared by: Quintin Sumabat, Deputy Executive Officer, Vehicle Engineering & Acquisition (213) 922-4922
Jesus Montes, Sr. Executive Officer, Vehicle Engineering & Acquisition (213) 418-3277

Reviewed by: Conan Cheung, Acting Chief Operations Officer, Bus (213) 418-3034
Debra Avila, Deputy Chief Vendor/Contract Management Officer, (213) 418-3051

Stephanie N. Wiggins
Chief Executive Officer

Los Angeles County
Metropolitan Transportation
Authority
One Gateway Plaza
3rd Floor Board Room
Los Angeles, CA

File #: 2022-0097, **File Type:** Motion / Motion Response **Agenda Number:** 25.

**OPERATIONS, SAFETY, AND CUSTOMER EXPERIENCE COMMITTEE
FEBRUARY 17, 2022**

Motion by:

DIRECTORS HAHN, SOLIS, MITCHELL, BUTTS, AND BONIN

J Line (Silver) Electrification Motion

The Metro J Line (Silver) Bus Rapid Transit service offers a single-seat ride, spanning 38 miles from San Pedro to El Monte. This high-quality bus line serves tens of thousands of riders daily, connecting them to jobs in Downtown LA, dozens of rail and bus lines, and Union Station.

The J Line is the next line set for electrification, with the Metro G Line (Orange) having recently gone fully electric. To ensure the success of this new technology, Metro staff have been evaluating locations for new en-route charging facilities and have identified the El Monte Bus Terminal and the Harbor Transit Gateway Center as the best-available locations.

As part of the NextGen Bus Plan, approved by the Board in October 2020 (Board File 2020-0617), Metro staff recommended terminating the J Line at Harbor Transit Gateway Center, in part owing to challenges with battery electric buses with limited range and Metro's difficulty finding a suitable en-route charging location in San Pedro. In order to maintain the current single-seat ride to San Pedro, the Board unanimously approved Motion 40 in November 2020 (Board File 2020-0781), which directed Metro to meet with numerous agencies about the possibility of locating charging facilities in San Pedro and to provide recommendations to fully electrify the J Line from El Monte to San Pedro.

In January 2022, Metro staff stated in their discussion of Motion 40 that, with a change order to the existing procurement for 100 electric buses on the J Line (Board File 2017-0304, July 2017, and Board File 2019-0605, September 2019), new technology could be installed that extends the range of these buses and ensures that efforts to go fully electric on this important line will not impact service.

SUBJECT: J LINE (SILVER) ELECTRIFICATION MOTION

RECOMMENDATION

APPROVE Motion by Directors Hahn, Solis, Mitchell, Butts, and Bonin to direct the Chief Executive Officer to return to the Board with a change order for the 100 electric buses designated for the J Line, to extend the range of these buses and to provide the single-seat ride requested by this Board.

PROCUREMENT SUMMARY

FORTY-FOOT (40') LOW FLOOR ZERO EMISSION TRANSIT BUSES / CONTRACT NO. OP28367-002

1.	**Contract Number**: OP28367-002			
2.	**Contractor**: BYD Coach & Bus, LLC (BYD)			
3.	**Mod. Work Description**: See Attachment B			
4.	**Contract Work Description**: See list of pending and negotiated changes in Attachment B.			
5.	**The following data is current as of**: 1/31/22			
6.	**Contract Completion Status**		**Financial Status**	
	Contract Awarded:	9/08/2017	**Contract Award Amount:**	$47,774,723
	Notice to Proceed (NTP):	11/15/2017	**Total of Modifications Approved:**	$54,604,344
	Original Complete Date:	8/16/2019	**Pending Modifications (including this action):**	$18,211,410
	Current Est. Complete Date:	1/24/2024	**Current Contract Value (with this action):**	$120,590,478
7.	**Contract Administrator**: Greg Baker		**Telephone Number**: (213) 922-7577	
8.	**Project Manager**: Julio Rodriguez		**Telephone Number**: (213) 922-6603	

A. Procurement Background

This Board Action is to approve Contract Modification No. 11 to provide vehicle telematics and charge management 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. Additionally, this modification will 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, in the total amount of $17,969,614.

This Contract Modification will be processed in accordance with Metro's Acquisition Policy and the contract type is a firm fixed unit price. All other terms and conditions remain in effect.

On July 20, 2017, the Board awarded Contract No. OP28367-002 to BYD Coach & Bus, LLC, for the manufacture and delivery of the 60 units of the 60' ZE transit buses in the Not-to-Exceed amount of $47,774,723. Attachment B shows the list of pending and negotiated change orders.

On September 19, 2019, the Metro Board approved Modification No. 2 to purchase 40 Contract Option forty-foot ZE buses for the firm fixed price of $30,863,440, increasing the Total Contract Value from $47,774,723 to $78,638,163.

Refer to Attachment B – Contract Modification/Change Order Log.

B. Cost Analysis

The recommended price of $17,969,614 including tax, has been determined to be fair and reasonable based upon an independent cost estimate, cost analysis, technical evaluation, fact finding, and negotiations.

Proposal Amount	Metro ICE	Negotiated Amount
$17,969,614	$19,059,977	$17,969,614

DEOD SUMMARY

VEHICLE TELEMATICS AND CHANGE MANAGEMENT SYSTEM AND 95 K9MD-ER EXTENDED RANGE BUSES/OP28367-002

A. Small Business Participation

BYD Coach and Bus, LLC, a Transit Vehicle Manufacturer (TVM), is on the Federal Transit Administration's (FTA) list of eligible TVMs. BYD Coach and Bus, LLC reported that is submitted its overall Disadvantaged Business Enterprise (DBE) goal of 2.5% to FTA for FY21. In compliance with 49 Code of Federal Regulations (CFR) Section 26.49(a)(1). TVMs submit overall DBE goals and report participation directly to FTA annually.

B. Living Wage and Service Contract Worker Retention Policy Applicability

A review of the current service contract indicates that the Living Wage and Service Contract Worker Retention Policy (LW/SCWRP) was not applicable at the time of award. Therefore, the LW/SCWRP is not applicable to this modification.

C. Prevailing Wage Applicability

Prevailing wage is not applicable to this modification.

D. Project Labor Agreement/Construction Careers Policy

Project Labor Agreement/Construction Careers Policy is not applicable to this Contract. PLA/CCP is applicable only to construction contracts that have a construction related value in excess of $2.5 million.

CONTRACT MODIFICATION/CHANGE ORDER LOG

FORTY-FOOT (40') LOW FLOOR ZERO EMISSION TRANSIT BUSES / CONTRACT NO. OP28367-002

Mod. No.	Description	Status (approved or pending)	Date	$ Amount
1	Modify SP-38 LEP definition of Disadvantage Worker	Approved	1/9/19	$0
2	Exercise 3.0 Optional Configuration - APC PF-1	Approved	12/3/19	$326,780.00
3	Extend Period of Performance for Base Buy to 11/1/2021	Approved	12/27/19	$0
4	Negotiated changes in configuration on base buy buses	Approved	4/4/20	($473,709.75)
5	Procure 10 shop chargers	Approved	10/22/20	$450,514.00
6	On-Route OPP chargers (8) Difference from original 300kW to 450kW	Approved	5/20/21	$450,592.80
7	Depot Chargers, Licenses, Monitoring, Infrastructure	Approved	6/30/21	$22,938,871.73
8	Exercise Option 1 for 40 Battery Electric Buses	Approved	7/26/21	$30,863,440.00
9	Negotiated changes for installing External MirrorEye Camera System and MERV-13 Air Filtration System	Approved	1/10/22	$47,855.57~~.00~~
10	Modeling Software	Pending	Pending	$241,796.50
11	**Vehicle Telematics and Charge Management System (RFC 15) & K9MD-ER Extended Range Buses (RFC24)**	**Pending**	**Pending**	**$17,969,613.80**
	Modification Total:			**$72,815,754.65**
	Original Contract:	**Approved**		**$47,774,723.91**
	Total:			**$120,590,477.56**

ATTACHMENT E
FUNDING AND EXPENDITURE PLAN CP 201077

	ITD thru FY21	FY22	FY23	FY24	FY25	Total LOP	% of Total
Vehicle: Battery Electric Buses	$2,027,629	$3,250,000	$42,497,094	$26,092,903	$4,248,227	$78,115,853	47.8%
Charging Infrastructure	$8,654,896	$642,785	$16,603,522	$16,603,522	$0	$42,504,725	26.0%
Prof Services / Consultants	$107,239	$2,800,000	$750,000	$640,000	$480,233	$4,777,472	2.9%
Staff Labor / Admin / Travel	$1,837,400	$321,809	$321,809	$321,809	$321,809	$3,124,636	1.9%
Contingency					$459,612	$459,612	0.3%
Subtotal	**$12,627,164**	**$7,014,594**	**$60,172,425**	**$43,658,234**	**$5,509,881**	**$128,982,298**	**78.9%**
Requested Change Order Items Causing the LOP increase							
1. Vehicle: K9MD-ER			$5,008,441	$5,008,441	$5,008,458	$15,025,340	9.2%
2. Charge & Load Management (Viriciti)			$981,425	$981,425	$981,424	$2,944,274	1.8%
Subtotal	**$0**	**$0**	**$5,989,866**	**$5,989,866**	**$5,989,882**	**$17,969,614**	**11.0%**
Requested Increase in LOP to In Order to Support Executed and Pending Change Orders							
1. Prof Services / Consultants		$650,000	$450,000	$400,000	$279,854	$1,779,854	1.1%
2. Staff Labor / Admin / Travel		$150,000	$350,000	$350,000	$370,146	$1,220,146	0.7%
3. Known/Unknown Contract Allowance			$4,327,333	$4,327,333	$4,327,333	$12,981,999	7.9%
4. Contingency					$600,089	$600,089	0.4%
Subtotal	**$0**	**$800,000**	**$5,127,333**	**$5,077,333**	**$5,577,422**	**$16,582,088**	**10.1%**
Total Project Costs (Uses of Funds)	**$12,627,164**	**$7,814,594**	**$71,289,624**	**$54,725,433**	**$17,077,185**	**$163,534,000**	**100.0%**

Sources of Funds	**(ITD) thru FY21**	**FY22 Q4**	**FY23**	**FY24**	**FY25**	**Total LOP**	**% of Total**
Federal (CMAQ/STBGP/5307)			36,051,000	10,000,000		46,051,000	28.2%
State: (STIP/MSRC)	12,627,164	7,014,594	17,977,242			37,619,000	23.0%
Local: (Prop C40% / MR 2% / TDA / Green Funds)	0		6,144,183	33,658,234	5,509,881	45,312,298	27.7%
Total Orig Sources	**12,627,164**	**7,014,594**	**60,172,425**	**43,658,234**	**5,509,881**	**128,982,298**	**78.9%**
New Funding Source						0	0.0%
LCTOP (Actual LCTOP Award for FY19-20: $39,098,039)		800,000	11,117,199	11,067,199	11,567,304	34,551,702	21.1%
Total NEW Funding Source(s)	**0**	**800,000**	**11,117,199**	**11,067,199**	**11,567,304**	**34,551,702**	21.1%
**** Future Local, State & Federal Funds to be identified as they become available.***							
Total Funding Sources	**$12,627,164**	**$7,814,594**	**$71,289,624**	**$54,725,433**	**$17,077,185**	**$163,534,000**	**100.0%**

Note: Recommendations requests an LOP increase of $34,551,702 to be funded with LCTOP and other eligible local funding sources.
LOP Increase is required to fund upgrade for (95) K9MD-ER Extended Range Buses, provide telematics and provide addl CMA for future change orders.
Current LCTOP approved amount is $39,098,039. and is an approved funding source for this project and use for Charging Infrastructure
Other State and Local funding sources will be allocated to meet expenses in excess of LCTOP and proposed LOP.