

ADVANCED TRANSIT VEHICLE CONSORTIUM

Los Angeles County Metropolitan Transportation Authority
One Santa Fe Ave., MS 63-4-1,
Los Angeles, CA 90012

JUNE 2, 2015

SUBJECT: CONVERT SIX (6) HYBRID BUSES TO SUPER LOW EMISSION (SLEB) TRANSIT BUSES

ACTION: APPROVE CONTRACT AWARD TO BYD MOTORS, INC. FOR CONVERSION OF SIX (6) HYBRID BUSES TO SLEB TRANSIT BUSES

RECOMMENDATIONS

1. Award Contract No. OP33203278, to BYD Motors, Inc. (BYD), Los Angeles, CA, for the conversion of six (6) Metro hybrid buses to SLEB/ZEB standards for a firm fixed price contract value of \$4,044,232.51, including tax and delivery.
2. Authorize ATVC staff to negotiate and execute with BYD future contract modifications to Contract No. OP33203278 for an amount not to exceed \$404,000 (10%) of the total contract value.

ISSUE:

In June 2013, the Metro Board directed ATVC staff to initiate a new RFP for the conversion of six existing Metro gasoline electric hybrid buses to Super Low Emission Bus standards.

ATVC's award approval of Contract OP33203278 will allow staff to authorize BYD to proceed with the work to modify the vehicle fuel and propulsion systems and other key sub-systems for six (6) Metro hybrid buses and to lower NOx emission levels by 75% - 90% in the retrofitted configuration.

DISCUSSION

ATVC purchased six gasoline electric hybrid buses in 2008 supplied by NABI, Inc. These buses used a gasoline electric hybrid propulsion system provided by the former ISE Inc., of Poway, CA. ISE went bankrupt and discontinued all operations in 2010, and ATVC and Metro have been unable to support daily operation of these hybrid vehicles since that time. ATVC staff considered various potential technologies currently in the

market that may be available and applicable for this conversion which include hybrid electric propulsion systems, CNG micro turbines, fuel cell and battery electric subsystems, and other low emission propulsion system components.

There are firms that currently have the specialized capabilities in bus system integration, and who also have the specialized expertise needed to return these buses to a fully operational condition. Converting these buses to an upgraded “Super Low Emission” (SLEB) configuration was consistent with the intent of the original direction from Metro’s Board, but the proposals for SLEB configuration proved to be more costly than converting these buses to a Zero Emission (ZE) configuration.

BYD’s proposed engineering/technological approach for the conversion will utilize components and subsystems that have already been proven in heavy duty bus operations. The proposed major components have been built in mass production quantities and used in buses that are currently in transit service and have accumulated over 30 million passenger miles.

DETERMINATION OF SAFETY IMPACT

There is no anticipated safety impact for converting the six (6) hybrid vehicles to Zero Emissions Bus (ZEB) electric buses technology. In general, BYD’s conversion approach will utilize components and sub systems that have been proven in heavy duty applications and have been mass produced and used in buses currently in transit service.

Zero emission buses are expected to use high voltage electrical systems. While these systems are isolated from operators and passenger compartments, maintenance personnel will need additional specialized training to ensure that they are prepared to maintain these higher voltage propulsion systems.

FINANCIAL IMPACT

Total funding of \$30 million for “Super Low and Zero Emission buses” was approved by the Metro’s Board, and is included in the Vehicle Technology Cost Center (3320) in project 201071. Because this is a multi-year contract, the ATVC President and the Cost Center Manager will be responsible for ensuring that future year funding is programmed.

Impact to Budget

A. Source of funds: Prop C 40%; TDA Article 4; Measure R 35% (bus capital); SLPP Prop 1B; Prop 1B PTMISEA; CMAQ; State of Good Repair (Refer to Attachment B, Funding Plan).

ALTERNATIVES CONSIDERED

Staff considered continuing to not operate these hybrid vehicles in their original configuration. This is not recommended; in the two years of active operation, these buses proved to be unreliable and unsuitable for daily revenue service. Staff considered converting some of these six buses into a Super Low Emission (SLEB) configuration using micro-turbines. The two SLEB approaches were considered but not recommended because it was determined that these options had higher costs and carried more technical risk than BYD's zero emission (ZE) proposal.

NEXT STEPS

If the ATVC Board approves the award of Contract OP33203278 for the conversion of the six (6) inoperable gasoline hybrid buses to BYD, ATVC staff will execute the Contract and issue a notice to proceed.

ATTACHMENTS

Attachment A: Procurement Summary
Attachment B: Proposed Funding/Expenditure Plan
Attachment C: June 2011 Board Motion

Prepared by: John Drayton, Executive Vice President, ATVC



Richard Hunt
President
Advanced Transit Vehicle Consortium

Copies: ATVC Board Members and Alternates
Phillip A. Washington, Metro CEO
Stephanie Wiggins, Metro Deputy CEO (Interim)
Robert A. Holland, Metro COO (Interim)

PROCUREMENT SUMMARY

Six Gasoline Electric Hybrid Buses Conversions

1.	Contract Number: OP33203278	
2.	Recommended Vendor: BYD Motors, Inc.	
3.	Type of Procurement (check one): <input type="checkbox"/> IFB <input checked="" type="checkbox"/> RFP <input type="checkbox"/> RFP-A&E <input type="checkbox"/> Non-Competitive <input type="checkbox"/> Modification <input type="checkbox"/> Task Order	
4.	Procurement Dates:	
	A. Issued: April 15, 2014	
	B. Advertised/Publicized: April 16, 2014	
	C. Pre-proposal/Pre-Bid Conference: April 30, 2014	
	D. Proposals/Bids Due: June 26, 2014	
	E. Pre-Qualification Completed: October 23, 2014	
	F. Conflict of Interest Form Submitted to Ethics: October 18, 2014	
	G. Protest Period End Date: (15 Calendar Days after Notification of Intent to Award) December 16, 2014	
5.	Solicitations Picked up/Downloaded: 40	Bids/Proposals Received: 3
6.	Contract Administrator: Elizabeth Hernandez	Telephone Number: (213) 922-7334
7.	Project Manager: Phil Rabottini	Telephone Number: (213) 922-5871

A. Procurement Background

This Board Action is for a "Best Value" Request for Proposal (RFP) solicitation issued for a Contractor to convert six existing Metro gasoline electric hybrid buses to Super Low Emission Bus standards. The RFP was issued in April 2014 in accordance with Metro's Acquisition Policy, and the contract type is Firm Fixed Price. Twelve amendments were issued during the solicitation phase of this RFP.

- Amendment Nos. 1, 2 and 3 issued on April 21, 23, and 28, 2014 respectively, provided responses to questions raised by prospective proposers.
- Amendment No.4 issued on May 1, 2014 provided documents relating to the Pre-Proposal Conference.
- Amendment No.5 issued on May 2, 2014 provided information regarding the schedule for availability of the hybrid buses for inspection to the proposers.

- Amendment No.6 issued on May 6, 2014 provided further responses asked by the proposers after the hybrid bus inspections.
- Amendment No.7 issued on May 8, 2014 provided 1) Answers to questions raised by potential proposers; 2) Revised Attachment 1 – Pricing Forms and 3) Service data and information for the buses for informational purposes only.
- Amendment No. 8 dated May 28, 2014 extended the submittal due date from June 3, 2014 to June 12, 2014.
- Amendment No. 9, dated June 3, 2014, revised Submittal Requirements with regard to Proposer's Anti-Drug and Alcohol Abuse Program, and the Revised Submittal Checklist.
- Amendment No 10, dated June 6, 2014, provided an Excel version of the Pricing forms at the request of prospective proposers.
- Amendment No. 11, dated June 12, 2014, extended the due date to June 26, 2014.
- Amendment No. 12, dated September 16, 2014 was issued to Proposers after receipt of proposals, to provide Proposers within the competitive range with the amended Volume 1 of II of the RFP to include SBE goal participation requirements.

A total of three proposals were received on the proposal due date of June 26, 2014.

B. Evaluation of Proposals/Bids

All of the three proposals received met the Minimum Qualifications criteria, and were evaluated and determined to be within the competitive range. A Source Selection Committee (SSC) consisting of staff from Metro's Vehicle Technology Department was convened and conducted a comprehensive technical evaluation of the proposals received. The SSC also held direct interviews with each of the three responsive and responsible Proposers and performed manufacturing and engineering site surveys to fully assess the Proposers' capabilities, capacities, strengths and weaknesses.

Minimum Qualifications (Pass/Fail)

To be considered, a proposal must evidence compliance ("Pass") with the following minimum qualifications. Proposals that did not evidence compliance ("Fail") may not be considered beyond the preliminary review.

1. Proposers' firm and/or key personnel shall demonstrate past relevant experience manufacturing and/or modifying propulsion systems on medium duty or heavy duty transit vehicles (or other similar equipment) within the past four (4) years (since 2010).
2. Proposers shall demonstrate that they have access to secure and suitable facilities, tools and equipment necessary to perform the Work.

Firms that met the Minimum Qualifications were then evaluated based on the RFP Evaluation Criteria which consisted of the following Main Factors:

- Price 40%
- Technical Compliance 30%
- Past Experience and Project Management. 30%

The SSC conducted interviews and performed manufacturing site visits. The firms' project managers and key proposed team members had an opportunity to present qualifications and respond to the evaluation committee's questions. In general, each team's presentation addressed the requirements of the RFP, experience with all aspects of the required tasks, and stressed each firm's commitment to the success of the project. Also highlighted were staffing plans, manufacturing plans, schedules and perceived project issues. Each team was asked questions relative to each firm's proposed engineering/technological approach and prior experience implementing this approach, staff experience and qualifications, manufacturing capabilities and capacity, facility development, and work plan.

The three responsive, responsible proposers deemed to be within the competitive range are listed below.

1. BYD Motors, Inc. (BYD)
2. Ebus, Inc. (Ebus); and
3. Transportation Power, Inc. (Transpower)

Qualifications Summary of Firms within the Competitive Range:

BYD Motors, Inc.

BYD was founded in 1995 and has its offices in Los Angeles, California and a manufacturing facility in Lancaster. BYD has been manufacturing its proprietary propulsion systems since 2010 and the systems include BYD Li+Fe battery, BYD in wheel traction motor rear axle, battery management system and CAN Bus. BYD proposed to provide not only parts and labor to integrate the proposed conversion package but also the engineering resources to model and qualify the entire system into the existing NABI 42 BRT buses that are being converted. BYD's head of engineering in the US, who authored BYD's proposed conversion plan, was on the team that originally designed and qualified the 42' BRT NABI buses.

BYD's electric bus uses BYD's proprietary iron phosphate batteries and propulsion systems. Since January 2011, BYD reports its electric buses have travelled over 16.8 million miles in passenger service worldwide.

Ebus, Inc.

Ebus was founded in 1998 in Downey, CA. Ebus has many years of experience in electric bus engineering and systems integration. Ebus' primary experience has been the manufacture of complete 22-foot 22-seat electric drive buses and trolleys.

In 2002, Ebus manufactured and delivered ten 22-foot electric buses (shuttles) to Santa Barbara MTD. In 2003; Ebus delivered ten 22-foot electric buses (shuttles) to City of Anaheim which operated for 7 years and were later sold to Santa Barbara MTD. In 2004, Ebus delivered five 22-foot electric buses to Indianapolis transit system. Ebus delivered five low floor 22-foot electric drive trolleys to Coral Gables, Florida. Ebus also delivered one 22-foot fuel cell bus to University of Texas, Austin and one 22-foot fuel cell bus to New Haven, CT Transit District.

Ebus proposed a Capstone Turbine Company micro-turbine C-65 for this SLEB conversion. The C65 operates on compressed natural gas, and produces 65 kW of electricity, more than enough to keep the batteries of the electric bus evenly charged when operating in typical transit service.

Ebus maintains a 60,000 foot factory building in Downey. Spare parts are distributed from Downey facility, and is their focal point for warranty and field service activities.

Transpower, Inc.

Transportation Power, Inc. (TransPower) is a California corporation located in Poway, California, and is a vehicle original equipment manufacturer registered with the U.S. Department of Transportation and licensed with the State of California. Founded in 2010 and located in Poway, California, TransPower has developed electric propulsion, battery energy storage, system integration, and vehicle control technologies. TransPower proposes to utilize the strengths of their current product line, and the perspectives and lessons learned by its employees during the conversion of dozens of different vehicle models to EV and HEV propulsion, dating back to 1996.

TransPower's approach for the conversion project is to achieve a super-low emission bus (SLEB) and 300-mile operating range utilizing a modified version of TransPower's most powerful battery-electric drive system, augmented with a Capstone microturbine that will run on compressed natural gas. The components and integration methods proposed by Transpower have not been utilized in heavy-duty transit vehicles.

The SSC's recommendation for the top ranked firm and the table for the scores are as follows:

1	FIRM	Average Score	Factor Weight	Weighted Average Score	Rank
2	BYD MOTORS, INC.				
3	Price	100.00	40.00%	40.00	
4	Technical Compliance	79.17	30.00%	23.75	
5	Past Performance and Project Management Experience	70.83	30.00%	21.25	
7	Total		100.00%	85.00	1
8	EBUS, INC.				
9	Price	74.38	40.00%	29.75	
10	Technical Compliance	66.39	30.00%	19.92	
11	Past Performance and Project Management Experience	60.56	30.00%	18.17	
12	Total		100.00%	67.84	2
13	TRANSPower, INC.				
14	Price	42.89	40.00%	17.16	
15	Technical Compliance	68.33	30.00%	20.50	
16	Past Performance and Project Management Experience	56.11	30.00%	16.83	
17	Total		100.00%	54.49	3

C. Price Analysis

The recommended price has been determined to be fair and reasonable based upon adequate price competition, and award to the lowest proposed price offer. Metro also performed fact finding, technical evaluation, independent cost estimate and analysis. The price is 12% higher than the Independent Cost Estimate (ICE) because the ICE did not account for the NRE and product support included in the proposed price.

The recommended awardees' price for the conversion of six hybrid vehicles is \$4 million or 28% lower than the next lowest offer.

	<u>FIRM</u>	<u>TOTAL PRICE</u>	<u>DIFFERENCE</u>
1.	BYD Motors, Inc.	\$4,044,232	—
2.	Ebus	\$5,166,240	28%
3.	Transpower Inc.	\$8,002,361	98%

The proposed price offers included pricing for the six (6) hybrid vehicle conversions, spares, special tools, test equipment, training, manuals, delivery and taxes and operational/technical support for base years 1 through 3 and three one-year options.

D. Background on Recommended Contractor

The recommended firm, BYD, is headquartered in Los Angeles, CA. BYD also has a manufacturing facility in Lancaster, California. BYD has been in business for 18 years and is a world leader in the field of battery technology and electric bus vehicles. BYD is the largest supplier of rechargeable batteries in the world, and has the largest market share for Nickel-cadmium batteries, handset Li-ion batteries, cell-phone chargers and keypads worldwide. BYD's current projects include the operation of over 200 electric buses in Shenzhen.

BYD's most recent clients include Antelope Valley Transit Authority and Stanford University.

BYD's Program Manager has extensive bus experience in the U.S. and China. He has over ten years of experience with BYD, which include being a lead design engineer and BYD America's, New Business Development Manager. He is currently BYD's North America's Vice President for Operations.

E. Small Business Participation

The Diversity and Economic Opportunity Department (DEOD) established a 5% Small Business Enterprise (SBE) goal for trucking opportunities in this solicitation. BYD Motors, Inc. did not make an SBE Commitment. BYD Motors, Inc. explained that the zero emission propulsion and energy storage systems are designed and manufactured by BYD Motors, and that the installation, modification, and engineering of the conversion must be completed by BYD Motors, Inc.

To meet the established SBE goal, Contractors are strongly encouraged to subcontract with small businesses; this message is also communicated in the solicitation document and is reiterated by DEOD representatives during pre-bid/proposal conferences. For outreach assistance, DEOD prepares and includes in the solicitation, a listings of available SBE subcontractors identified by North American Industry Classification Standards (NAICS) codes, for available subcontract opportunities. Contractors are directed to contact DEOD representatives for assistance with identifying small businesses interested in pursuing contracting opportunities. Metro's SBE program is race neutral. Therefore, meeting the SBE goal is neither a condition of award nor an issue of responsiveness.

F. All Subcontractors Included with Recommended Contractor's Proposal

	Subcontractor	Services Provided
1.	None	N/A

ATTACHMENT B

ZERO EMISSIONS BUS CONTRACT FUNDING/EXPENDITURE PLAN

In Thousands	FY14	FY15	FY16 +	Total	% of Total
Uses of Funds					
Acquisition	6,000,000	6,000,000	8,739,250	20,739,250	69.1%
Professional Services ¹	250,000	250,000	3,500,000	4,000,000	13.3%
Labor	300,000	300,000	300,000	900,000	3.0%
Travel	150,000	150,000	100,000	400,000	1.3%
Spare Parts ²	250,000	250,000	1,386,825	1,886,825	6.3%
Contingency			2,073,925	2,073,925	6.9%
Total Project Cost	6,950,000	6,950,000	16,100,000	\$30,000,000	100%
Sources of Funds					
In Thousands	FY14	FY15	FY16 +	Total	% of Total
Measure R 35%	6,950,000	6,950,000	16,100,000	\$30,000,000	100%
Total Project Funding	6,950,000	6,950,000	16,100,000	\$30,000,000	100%

1. Includes \$3.5 million in funding to cover estimated expenses for converting six existing gasoline hybrid buses to *super low emission configuration*.
2. Includes \$1.2 million in funding to cover estimated expenses for acquiring high voltage "Fast Charging" equipment.
3. Initial source of funds plans for Measure R 35%. Staff will apply other local, state or federal sources as they become available/ applicable to project uses.

**FINANCE AND BUDGET COMMITTEE
MARCH 16,2011**

**OPERATIONS COMMITTEE
MARCH 17,2011**

MOTION BY DIRECTORS VILLARAIGOSA, KNABE AND ANTONOVICH

SUPER LOW/ZERO EMISSION BUS PROGRAM

The Los Angeles County Metropolitan Transportation Authority (MTA) was a pioneer in moving its bus fleet to cleaner alternative fuels and continues to be a national leader, with the largest fleet of compressed natural gas (CNG) buses in the U.S. and a 100% CNG fleet.

This transition from diesel to CNG buses was not made for economic or business reasons. It was known and it is the case that the transition would cost MTA more than continuing with a diesel fleet through higher vehicle costs and new fueling infrastructure. Instead, the MTA Board made this transition for public policy reasons, namely to reduce emissions (particulate matter, nitrous oxides, and sulfur oxides) and improve public health.

The MTA Board decided to make an investment in cleaner air for the residents, workers, and visitors of Los Angeles County and the South Coast air basin. Since MTA started buying CNG buses there has been a growing focus on reducing greenhouse gases (GHG) as well. Today, emerging technologies offer the hope of super low or zero emissions, including electric, fuel cell, and hybrid buses. However, buses featuring these technologies have a number of challenges for operating agencies like MTA, including limited in-service experience, relative higher vehicle acquisition costs, and potential additional infrastructure costs. On the other hand, these newer buses may reduce operating and maintenance costs and lower life cycle costs than our current fleet.

As a matter of public policy, MTA should continue to be on the forefront of deploying lower emission buses, but we should do so in a fiscally and operationally prudent manner.

I THEREFORE MOVE that the MTA Board direct the CEO to develop a recommended strategy and timeline, subject to future review and approval by the MTA Board, for transitioning to super low/zero emission buses.