

BOARD MEETING DATE: February 7, 2014

AGENDA NO. 6

PROPOSAL: Execute Contract to Develop and Test Retrofit All-Electric Transit Bus 

SYNOPSIS: Complete Coach Works (CCW) is a bus remanufacturing company that has undertaken initial development efforts to produce an electric bus for transit applications. Leveraging their previous work, CCW proposes to further develop their electric bus concept by extending the driving range and reducing the total cost of ownership to increase the vehicle's market appeal. This vehicle will be deployed in normal fleet service to evaluate its environmental benefits and lower operating costs. This action is to execute a contract with CCW in an amount not to exceed \$395,000 from the Clean Fuels Fund (31). The total cost for this proposed project is expected to be \$856,700.

COMMITTEE: Technology, January 24, 2014, Recommended for Approval

RECOMMENDED ACTION:

Authorize the Executive Officer to execute a contract with CCW in an amount not to exceed \$395,000 from the Clean Fuels Fund (31) for the development and demonstration of a long-range all-electric transit bus.

Barry R. Wallerstein, D.Env.  
Executive Officer

MMM:JC

---

**Background**

Complete Coach Works (CCW) is located in the City of Riverside and is one of the largest bus remanufacturing companies in the nation. Their core business involves the remanufacture of older buses to near-new condition. Their business scope has expanded, and they have self-funded the development of two iterations of a low floor 40-foot electric drive transit bus. These electric transit buses were refurbished chassis from CCW's core business operations. The first generation electric bus was road tested by CCW in May of 2012 and was able to demonstrate a useful driving range of 90 miles

while accruing 20,000 miles without a significant failure. The second generation electric bus was fielded in May of 2013. The second generation transit bus included a larger battery pack and slightly more powerful electric motor, which was able to extend the driving range up to 130 miles. This bus was placed in normal revenue passenger service and accrued 6,000 miles without failure at Ben Franklin Transit.

### **Proposal**

CCW proposes to partner with the SCAQMD, U.S. Hybrid and EV Grid to design, develop and demonstrate a third generation of their electric bus concept. This bus would also be built on a refurbished chassis from CCW's core business and would incorporate significant improvements to the electric drive system. The improvements to the electric drive system would be focused on making the electric transit bus competitive with its conventional internal combustion repowers on both an initial purchase cost and performance basis, while being significantly less costly to own and operate on a full life-cycle basis. The drive system is proposed to be locally sourced from U.S. Hybrid and would yield a higher power output while being significantly lighter as a result of operating at a higher system voltage. The battery pack is proposed to be manufactured by EV Grid and would utilize a more power dense lithium ion chemistry to further trim system weight, while utilizing a cylindrical battery cell that is in high-volume production to reduce the overall cost. The energy storage capacity would also be increased from their previous efforts to increase the range of the bus. CCW is targeting a driving range of 150 miles, as they believe this would satisfy 80 percent of the needs of their customer base and would be a commercially marketable product.

The third generation electric bus is expected to be demonstrated with the City of Gardena. This evaluation would prove out the utility of the electric bus concept and quantify the operating cost of the vehicle relative to traditional vehicles in their fleet.

### **Benefits to SCAQMD**

The expansion of electric vehicle technologies is included in the *Technology Advancement Office Clean Fuels Program 2013 Plan Update* under the category of "Electric/ Hybrid Technologies and Infrastructure." The electrification of transportation technologies has the potential to lower criteria pollutant emissions and reduce greenhouse gas emissions. This can provide substantial air quality benefits to communities, neighborhoods and schools where these vehicles operate.

### **Sole Source Justification**

Section VIII.B.2 of the Procurement Policy and Procedure identifies four major provisions under which a sole source award may be justified. This request for a sole source award is made under provision B.2.d.: Other circumstances exist which in the determination of the Executive Officer require such waiver in the best interest of the SCAQMD. Specifically, these circumstances are: B.2.d.(1) Project involving cost sharing

by multiple sponsors. The multiple sponsors contributing financially to this project include CCW, U.S. Hybrid and EV Grid.

**Resource Impacts**

The total cost for the project is \$856,700 with the proposed SCAQMD cost not to exceed \$395,000 from the Clean Fuels Fund (31). The project funding sources are identified in the table below.

	<b>Funding Amount</b>	<b>Percentage (%)</b>
CCW	\$390,200	46
U.S. Hybrid	\$44,500	5
EV Grid	\$27,000	3
SCAQMD (requested)	\$395,000	46
Total	\$856,700	100

Sufficient funds are available in the Clean Fuels Fund (31) for this proposed project. The Clean Fuels Fund (31) is established as a special revenue fund resulting from the state-mandated Clean Fuels Program. The Clean Fuels Program, under Health and Safety Code Sections 40448.5 and 40512 and Vehicle Code Section 9250.11, establishes mechanisms to collect revenues from mobile sources to support projects to increase the utilization of clean fuels, including the development of the necessary advanced enabling technologies. Funds collected from motor vehicles are restricted, by statute, to be used for projects and program activities related to mobile sources that support the objectives of the Clean Fuels Program.