



November 9, 2017

To: Transit Committee *Handwritten signature: J. Kenneth R. [unclear] for*
From: Darrell Johnson, Chief Executive Officer
Subject: Agreement for the Construction, Operation, and Maintenance of a Hydrogen Fuel Station, and the Purchase and Delivery of Liquid Hydrogen for the Santa Ana Bus Base

Overview

The Orange County Transportation Authority has been awarded grant funds for the purchase of ten hydrogen buses, construction of a hydrogen fuel station, and modifications to facilities. In March 2017, the Board of Directors awarded a sole source agreement for the hydrogen station to the vendor identified in the grant; however, the vendor was unable to accept the terms and conditions of the proposed contract that were intended to protect the Orange County Transportation Authority from risk. A procurement was conducted and award of an agreement is recommended.

Recommendations

- A. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-1577 between the Orange County Transportation Authority and Trillium USA Company LLC, in the amount of \$6,472,127, for the construction, operation, and maintenance of a hydrogen fuel station and liquid hydrogen deliveries for a three-year term, with two, one-year option terms.
- B. Amend the Orange County Transportation Authority's Fiscal Year 2017-18 Budget, in the amount of \$4,777,732, to accommodate the construction of a liquid hydrogen fuel station at the Santa Ana Bus Base.

Discussion

On February 13, 2017, the Orange County Transportation Authority (OCTA) Board of Directors (Board) authorized the Chief Executive Officer to negotiate and execute an agreement with the Center for Transportation and the Environment (CTE) to accept \$13,241,092 in grant funds from the California

Air Resources Board (ARB) and the South Coast Air Quality Management District (SCAQMD). OCTA partnered with CTE, the Alameda Contra Costa Transit District, New Flyer of America, and Linde LLC (Linde) to submit a grant application that would provide OCTA with ten hydrogen fuel cell buses, a liquid hydrogen fueling station, and modifications to facilities for the detection and emergency evacuation of hydrogen gas.

On March 13, 2017, the OCTA Board awarded a sole source agreement to Linde for the construction of the hydrogen fuel station. After several months of negotiations, Linde would not accept various terms and conditions within the agreement intended to protect OCTA from risk. Since Linde was a named partner in the grant application, CTE and OCTA staff consulted ARB to determine if a new partner could be identified. ARB agreed, provided that the hydrogen station would meet the performance standards identified in the grant agreement and the hydrogen station could be commissioned within the grant time limit. Since CTE is the direct grant recipient, CTE led the procurement effort.

Procurement Approach

The procurement was conducted by CTE in consultation with OCTA's Contract Administration and Materials Management (CAMM), Facilities Engineering, and Transit Maintenance departments. All solicitation documents, evaluation criteria, and scoring met OCTA procurement guidelines. In addition to cost, award is recommended to the firm offering the most comprehensive overall proposal, considering factors such as qualifications, staffing, and project organization.

CTE released the request for proposals (RFP) on July 12, 2017, to 18 firms and one trade organization. A pre-proposal conference and job walk were held on July 25, 2017, with 14 firms in attendance. Additionally, staff from ARB and SCAQMD attended as the agencies providing the grant funds. Four addenda were issued to provide a copy of the pre-proposal conference registration sheets, respond to questions, clarify technical specifications, and extend the proposal due date.

On September 8, 2017, six proposals were received. An evaluation committee consisting of staff from CTE and OCTA's CAMM, Facilities Engineering, and Transit Maintenance departments met to review the submitted proposals. The proposals were evaluated based on the following criteria and weights:

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|-------------------------------------|------------|
| • Qualifications of the Firm | 30 percent |
| • Staffing and Project Organization | 30 percent |
| • Work Plan | 20 percent |
| • Cost and Price | 20 percent |

A higher level of importance was assigned to the qualifications of the firm and staffing and project organization emphasizing the importance of the firm's related experience, with a proven history in successfully completing similar station construction, maintenance, and providing uninterrupted fuel supply. The work plan was weighted at 20 percent as firms needed to address every aspect of the requirements specified in the scope of work, demonstrate knowledge and understanding of the requested services of building and maintaining the station, and providing training. The cost and price was weighted at 20 percent of the total proposal score as it was a critical requirement for firms to demonstrate competitiveness in pricing to carry out the required services; and was further divided with 30 percent attributed to the construction of the station, 35 percent attributed to operation and maintenance (O&M), and 35 percent attributed to fuel price to ensure best value for the operation of the station.

On September 19, 2017, the evaluation committee met to review all proposals based on the evaluation criteria and short-listed four firms listed below in alphabetical order:

Firm and Location

Clean Energy (CE)
Newport Beach, California

ITM Power Inc. (ITM)
Anaheim, California

Nel Hydrogen (Nel)
Palo Alto, California

Trillium USA Company LLC (Trillium)
Houston, Texas

On September 26, 2017, the evaluation committee held interviews with the four short-listed firms. Each firm had the opportunity to present its approach for accomplishing the requested services and resolving any foreseen issues, as well as respond to evaluation committee questions.

On September 29, 2017, a best and final offer (BAFO) was requested from each of the four short-listed firms to provide more competitive pricing.

After considering the information obtained from interviews and the BAFO, the evaluation committee made adjustments to preliminary scores. The first and

second-ranked firms remained unchanged, while the third and fourth-ranked firms changed places.

Based on the evaluation of the written proposals, the information obtained from the interviews, and the BAFO, it is recommended that Trillium be selected to provide a hydrogen fueling station, O&M, and delivery of liquid hydrogen. The following is a brief summary of the proposal evaluation results.

Qualifications of the Firm

All four firms are established companies with experience in providing fueling station construction to various agencies, with OCTA doing business with both Trillium and CE in recent years.

Trillium has over 20 years of experience in designing alternative fueling stations and specializes in serving the transit industry. Three of OCTA's compressed natural gas (CNG) stations were built and are maintained by Trillium. Air Products, Trillium's proposed subcontractor, built and commissioned a liquid hydrogen based bus fueling station for the Stark Area Regional Transit Authority in Canton, Ohio. Locations include headquarters in Texas, as well as offices in California, Oklahoma, and Utah. Trillium is owned and financially backed by Love's Travel Stops & Country Stores, which is widespread throughout 40 states.

CE has been providing alternative fueling solutions for customers for over 20 years. One of OCTA's CNG stations was built and is maintained by CE, and currently CE provides OCTA with liquefied natural gas fuel as well. Linde, CE's proposed subcontractor, designed AC Transit's hydrogen bus fueling station. In addition to locations in New Hampshire and Texas, CE has local headquarters in Newport Beach, California.

ITM was founded in 2004 in the United Kingdom (UK) and established in 2012 in Irvine, California; the company owns and operates fueling stations in Riverside, California, in addition to refueling station sites in the UK and the United States (US). ITM's regional offices are in California, Germany, the Nordics, and Benelux regions.

Nel was previously owned by Norsk Hydro, a company focused on electrolyzers, which then turned its focus to hydrogen in 2011. Making deliveries to over 80 countries with employees in the US and Europe, its primary experience is in providing equipment and support for fueling stations. Nel has a location in San Francisco and proposed adding one in Orange County.

Staffing and Project Organization

All firms presented solid key staff and proposed a construction schedule that fits within OCTA's timeline.

Trillium has partnered with Air Products for the project. Air Products will stock and provide all major equipment. Air Products will also control the schedule. Trillium will dedicate an engineer and an on-site project manager, each with approximately 20 years of industry experience, specifically to this project. There have also been three principle staff identified to oversee each of the three main phases of the project: design, build, and operations. Trillium has listed seven assigned staff members, and Air Products has identified four. Trillium will remain the primary point of contact and be responsible for all tasks, ensuring that the project stays within budget and on schedule. A Station Performance Manager has been selected to enforce checks and balances built into the project plan for quality assurance. OCTA's hydrogen station will be viewed as a critical project at the highest levels of management within Trillium.

CE proposed to partner with Linde to provide equipment and liquid hydrogen, and proposed to work with Fueling & Service Technologies Inc. (FASTECH) to provide construction services. Designated staff includes five from CE, two from Linde, and two from FASTECH. CE proposed to use e-Builder, a cloud-based construction management software throughout the project. The project manager will monitor and maintain the master schedule, and all information will flow through that individual. Bi-weekly coordination meetings and monthly progress reports will be required.

ITM proposed to work with EPC, LLC (EPC) and hire additional subcontractors after award. EPC's project manager has over 45 years of experience and will assist with the design and construction of the station. ITM has split the project into two phases, identifying two sets of dedicated staff accordingly. The proposed individuals have been with ITM for a range of one to 15 years, with the majority being over ten years. The project lead and project manager will maintain open reporting channels and hold weekly meetings.

Nel proposed to work with Fiedler Group, Nicosia Contracting International, and Praxair to provide all deliverables. Fiedler will manage civil works, engineering, and permitting. Nicosia will execute the civil works. Praxair will deliver and maintain the leased liquid hydrogen equipment and manage a continuous delivery of hydrogen. Nel will act as Project Manager on behalf of the partners and will manufacture, install, and conduct O&M on the equipment. Six designated staff have been identified from Nel, one from Praxair, two from Fiedler, and two from Nicosia.

Work Plan

Trillium will prepare station plans, technical specifications, and will be responsible for new utility infrastructure, including electrical, communications, water, and natural gas. Air Products will provide the design, equipment, construction, commissioning, and training. Air Products will deliver liquid hydrogen to the station on a weekly basis. The liquid hydrogen storage tank and vaporizer will be leased. Trillium is knowledgeable about OCTA's Fleetwatch data system and will ensure that the dispenser is properly integrated. Trillium will be able to provide data reports and metrics similar to those requested in the RFP. Trillium will also be supplying preventive O&M services on a daily basis. The proposed fueling time per bus is six to ten minutes, with continuous bus fills per hour. There is no waiting time between fills due to the addition of extra gas cooling in the hydrogen compression system, going beyond the scope of work for required equipment. The proposed compression system will allow for the option of expanding the fleet to 20 buses without the purchase of additional equipment.

CE proposed to provide design, engineering, permitting, construction management, and O&M. Linde will manage the logistics and hydrogen deliveries to a liquid hydrogen storage tank installed at the station. The dispenser will be made and provided by Linde, as well as the vaporizers on the tank used to supply hydrogen to the compressors. Two compressors will supply compressed hydrogen to a three-bank cascade storage system. Linde listed a different set of equipment than what was originally proposed for the grant, changing the fueling time per bus to 9.3 minutes and restricting capacity to four bus fills per hour, temperature limited. The station will be monitored by Linde's Siemens PLC system, which will scan all operations and safely shut down operations if any parameter is out of range. CE has successfully integrated a hydrogen dispenser with the Fleetwatch system at AC Transit's hydrogen station and proposed to do the same for OCTA. The firm's Operations Center is in Newport Beach, California, and staff will be available immediately to evaluate and respond to any issue. There will be one appointed project manager to maintain a project master schedule and use e-Builder software to provide project status reporting throughout the process. The proposed design allows for the scalability of 50 to 100 buses with the purchase of additional equipment.

ITM deviated in proposing an on-site system that would require OCTA to double its current electricity from 600 amps to 1,200 amps. The firm offered an oversized compression and storage system with an electrolyzer that consumes tap water when generating hydrogen. This system would allow for future expansion to fill 16 to 20 buses, but it would necessitate the addition of 1,200 amps of electricity for a total of 2,400 amps. The proposed fueling time

per bus is five to seven minutes, with ten bus fills per hour. Subcontractors will specify, bid, and procure the compressors, storage tanks, and dispenser during the design process. ITM and EPC will coordinate delivery of all major technologies. EPC will prepare an O&M manual to support field operations. Local contractors will be hired to perform the civil works and electrical interconnections. Performance monitoring will be remote, and any alarms will receive a response within three hours. ITM will work with OCTA and CTE to ensure the data acquisition tool provides sufficient detail. The control system will meet all requirements and will interface seamlessly with the required Fleetwatch system.

Nel has proposed a hydrogen station to be built to accommodate both liquid and gaseous hydrogen delivery by truck. For liquid delivery, a leased liquid tank and a vaporizer would provide hydrogen to a compressor that increases the pressure and delivers this into supply storage. The vaporizer is built to prepare the station for future expansion. The dispenser is able to provide two back-to-back bus fills per hour, with a fueling time per bus of ten minutes. Fueling capacity could be doubled by adding a second complete set of equipment for an additional cost, ensuring a fully redundant system where each dispenser operates independently. Nel guarantees a two hour or less, 24/7 response time for remote event resolution. Nel is actively working to establish large-scale, renewable hydrogen production based on electrolysis. Once available, the liquid supply will be replaced, as the proposed equipment is prepared to accommodate a gaseous supply. The fueling solution adapts the fueling dispenser to interface with the Fleetwatch system at OCTA.

Cost and Price

All firms were asked to propose a total firm-fixed price for equipment purchases (including warranties and minimum one year of O&M), a firm-fixed price for annual fees for equipment lease for an initial three-year term, plus two, one-year option terms, and a maximum not to exceed price for fuel charges for the same term. The total cost and price constituted 20 percent of the total proposal score and consisted of three subcategories that were weighted separately: construction of the station (30 percent), O&M (35 percent), and fuel price (35 percent). Price scores were based on a formula which assigned the highest score to the lowest cost in each subcategory, and scored the other proposals' subcategory pricing based on the relation to the lowest pricing in each subcategory. Firms were also asked to provide optional pricing for the installation of a second dispenser.

Attachment B shows the comparative prices amongst all firms for both the basic proposal totals as well as the optional price for the second dispenser. Trillium's

proposed lowest overall price not only included the base requirements, but also provided two additional years of O&M as value added services at no additional cost. Furthermore, Trillium's proposed lowest overall price will allow OCTA to purchase the optional second dispenser and still fall within the grant total. The price proposals submitted by the remaining firms would require extra funding, which OCTA would have to supplement beyond the grant amount.

Based on the evaluation of written proposals, the firm's qualifications, and information obtained from the interviews and the BAFO, the evaluation committee recommends award to Trillium, in the amount of \$6,472,127, for the construction of the hydrogen station, O&M of the station, and liquid hydrogen deliveries. The firm demonstrated a thorough understanding of OCTA's specific requirements for the construction and maintenance of a hydrogen fueling station and submitted a comprehensive proposal responsive to all requirements of CTE's RFP and the grant terms.

Fiscal Impact

The project was not included in OCTA's Fiscal Year (FY) 2017-18 Budget. Funds will be added to Capital Programs/Facility Engineering, Account 1722-9022-D2157-0MO, Hydrogen Fuel Station. The expenditure is offset by the ARB grant revenue in Account 0030-6053-D2157-YHS, approved by the Board on February 13, 2017, and is funded through the Low Carbon Transportation Investments and Air Quality Improvement Program grant from the California ARB's allocation of Cap and Trade Program funds. The budget for fuel charges will be included in OCTA's next proposed FY 2018-19 budget.

Summary

Based on the information provided, staff recommends the Board authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-1577 between the Orange County Transportation Authority and Trillium USA Company LLC, in the amount of \$6,472,127 for the construction, operation, and maintenance of a hydrogen fuel station and liquid hydrogen deliveries for a three-year term, with two, one-year option terms.

Attachments

- A. Review of Proposals, Agreement for the Construction, Operation, and Maintenance of a Hydrogen Fuel Station, and Liquid Hydrogen Deliveries
- B. Cost and Price, Agreement for the Construction, Operation, and Maintenance of a Hydrogen Fuel Station, and Liquid Hydrogen Deliveries
- C. Proposal Evaluation Criteria Matrix ("Short-listed Firms), Agreement for the Construction, Operation, and Maintenance of a Hydrogen Fuel Station, and Liquid Hydrogen Deliveries
- D. Contract History for the Past Two Years, Agreement for the Construction, Operation, and Maintenance of a Hydrogen Fuel Station, and Liquid Hydrogen Deliveries

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