

County of Milwaukee Interoffice Communication

DATE: 5/4/2018
TO: John Weishan, Jr., Chairperson, Transportation, Public Works & Transit Committee
FROM: Julie Esch, Interim Director, Department of Transportation
SUBJECT: Update on Battery Electric Buses in the Transit Industry

BACKGROUND

Proterra, a battery electric bus (BEB) manufacturer gave a presentation to the Transportation, Public Works, and Transit (TPW&T) Committee in March 2018. Following that presentation, the Committee requested a written informational report for the June 2018 cycle that focuses on the potential to add electric vehicles to the bus fleet of the Milwaukee County Transit System (MCTS).

MCTS is familiar with Proterra's vehicle from a previous on-site visit and equipment demonstration. In addition, MCTS requested that Proterra provide a total cost of ownership comparison between a BEB and conventional diesel bus and diesel-hybrid electric bus using the East-West Bus Rapid Transit (BRT) project as a model for service levels. In turn, Proterra has volunteered to assist MCTS in making a grant application to the Federal Transit Administration (FTA) for funds eligible to be used for BEBs and related infrastructure should Milwaukee County determine that it would like to pursue a BEB pilot project. This report is intended to help inform the decision regarding whether to pursue FTA funds for BEBs.

Battery Electric Bus (BEB) Benefits and Challenges

The benefits of BEBs include zero-emissions and the promise of a cleaner environment in the long-term. BEBs are also attractive to transit agencies because they are quieter, simpler, and smoother than their conventionally fueled counterparts due to their all-electric propulsion and auxiliary systems, which can also translate into better experiences for passengers and bus operators. Transit agencies have been somewhat slow to introduce BEBs into their fleet. Often pilot projects are a preferred strategy because they permit a system to experience the benefits of electric vehicles now, while waiting to see how the technology continues to evolve.

Challenges associated with the technology, include range limitations, required charging times, high electricity rates for some locations, complicated utility rate structures, and higher capital costs. Due to these factors, transit systems must make careful decisions about how to use the vehicles and when and where to recharge them. To better grapple with these challenges, some transit systems seek the help of consultants that can develop an appropriate strategy for how to use BEBs and identify the best charging technology for a fleet of BEBs. Over time, industry improvements have also resulted in increased propulsion system reliability, increased battery energy capacity, and decreased capital costs. Furthermore, it cannot be overlooked that technological improvements continue to extend operating ranges achievable by the batteries which mitigates some of the previous challenges and limitations of BEBs.

Transit Industry Experience with BEBs

According to the Transit Cooperative Research Program, in 2018 there were at least 13 BEB models available and more than 70 transit agencies with BEB deployments in the United States. A survey of about

twenty of these transit agencies revealed that half of the them implemented BEBs due to a combination of board direction, environmental regulations, and environmental or sustainability programs.

Agencies that were early adopters of BEB technology have advice for others:

- Make a plan that includes carefully evaluating the overall approach to BEBs by coordinating deployment of both the buses and the appropriate charging infrastructure.
- Don't expect to have the same level of service with a BEB as with your conventional fleet.
- Be prepared to train operators how to drive a battery electric bus in a manner that maximizes the vehicles range.
- Be prepared to train mechanics how to safely service the vehicles. Some transit systems have decided to maintain employs of the bus manufacturer on site indefinitely to operationalize both on-going training and maintenance.

BEB Funding Sources

There are two main funding sources for Milwaukee County to consider to support a BEB program:

- FTA 5307 Urban Area Formula Funds – this funding source is currently used to purchases standard diesel buses, make capital improvements, and cover maintenance costs associated with keeping federally funded vehicles, equipment and facilities in a state of good repair. By and large, these funds are already programmed into annual operating and capital budgets.
- FTA 5339 Low-No Discretionary Grant funds – this funding source is managed as an annual competitive grant, which is currently funded at \$84 million. The grant cycle is open NOW and applications for this funding are due on June 18, 2018.
 - The Low-No grant focuses on deploying new production vehicles; it gives priority consideration to the deployment of buses with the lowest energy consumption and least harmful emissions, including direct carbon emissions.
 - The Low-No Program provides funding for the purchase or lease of zero-emission and low-emission transit buses, including acquisition, construction, and leasing of required supporting facilities.
 - Proterra has a history of successfully assisting transit systems with the application process.
 - The local match for grant funds received through the Low-No grant process is 15%.

RECOMMENDATION

This report is for informational purposes. It is also intended to inform a decision regarding whether to pursue FTA funds for BEBs. Given the current state of the industry, which is still evolving, Milwaukee County is at a proverbial crossroads where the decision to proceed with a grant application is on balance with a decision to wait out another year to observe how the industry continues to develop. Of course, the East-West BRT project presents an ideal circumstance under which to venture into a BEB pilot project in a more controlled manner than adding BEBs to the fleet without a plan as to how they would be used.

Should Milwaukee County elect to pursue a Low-No grant in 2018, a resolution affirming the fiscal responsibility for the local match to the grant is a necessary component of the grant application. If Milwaukee County chooses to make application, MCTS would recommend that the application be coordinated with Proterra to maximize the potential for success.

Prepared by:

Dan Boehm, President & Managing Director, MCTS

Approved by:



Julie Esch
Interim Director, Department of Transportation

cc: Chris Abele, County Executive
Raisa Koltun, Chief of Staff, County Executive
Kelly Bablitch, Chief of Staff, County Board of Supervisors
Joe Lamers, Budget Director, DAS - PSB
Steve Cady, Research Director, Office of the Comptroller
Jonathan Schatz, Sr. Budget & Management Analyst, DAS-PSB