

Draft Memorandum for the Record

Boston Region Metropolitan Planning Organization

Transit Working Group Coffee Chat Summary: Fleet Electrification

February 28, 2022, Meeting

4:00 PM–5:00 PM, Zoom Video Conferencing Platform. Recording available at

https://www.youtube.com/watch?v=KxhoeExfUL8&list=PLT37eeNGYpCHBb_9LJp6xBrmCvTrjURYN&index=13

Introductions

Sandy Johnston (Central Transportation Planning Staff) invited attendees to introduce themselves using the Zoom chat function.

RIPTA Electrification Program

Zachary Agush from the Rhode Island Public Transit Authority (RIPTA) discussed the status of RIPTA's Zero-Emissions Vehicle Pilot Program. The pilot was intended to test the feasibility and limitations of deploying electric buses along existing transit routes in Rhode Island and has laid the foundation for the state's transition to a fully electric fleet.

The pilot included the following three phases:

1. Demonstration (testing vehicle performance, energy usage, and infrastructure requirements)
2. Broader Adoption (introducing fully battery-electric service on the R-Line)
3. Sustainable and Resilient Deployment (electrification of Newport-based services and completion of an action plan for electrification and service growth)

Three electric buses were leased during Phase I of the pilot program, all of which contained 440 kWh batteries and utilized depot chargers at one fixed site. RIPTA deployed these buses on the R-Line, their most contained, busiest route, and modified R-Line blocks to match electric bus performance trends, which differed from the existing fleet.

In 2021, RIPTA decided to fully electrify the R-Line based on the initial success of Phase I and purchased 14 additional electric buses that are scheduled for delivery in fall 2022 as part of Phase II. These buses will be equipped with on-route charging

capabilities that will be functional in spring 2023. As a result of this expansion, every one in five RIPTA passengers would be riding on an electric, zero-emissions vehicle.

Phase III of the pilot program is still in progress and will explore the feasibility of electrifying two facilities and all accompanying vehicles with up to 40 electric buses to be operated on six different routes. These upgrades will also include a resiliency demonstration, such as battery storage or a micro-grid. Funding sources identified for this phase include the Federal Transit Administration's (FTA) Low/No Emissions (LONO) Program, state contributions, RIPTA's capital budget, and federal earmarks.

Z. Agush continued his presentation with a discussion on lessons learned and suggested that others pursuing fleet electrification should consider the wide range of factors involved in a program's success, including increased vehicle and energy costs, infrastructure requirements such as charging stations, resiliency and potential renewable energy solutions, weather and temperature impacts on bus efficiency, general operations such as driver training, and integration with technology such as real-time vehicle and charging infrastructure monitoring, smart charge systems, data collection, scheduling software, and others.

Next steps for RIPTA's fleet electrification program include action planning and integration with the Rhode Island Transit Master Plan, strengthening partnerships with other state and local agencies, supporting implementation of climate policy, and leveraging federal investments for infrastructure improvements.

Discussion

S. Johnston posed four questions to help frame the discussion:

1. What are your plans for fleet electrification?
2. How do your experiences with preparing for electrification resemble RIPTA's, or not?
3. What planning needs do you have around electrification?
4. What capital investments do you anticipate making as part of the transition to an electric fleet?

The following is a largely paraphrased summary of the main points that attendees contributed to the conversation.

Sarah Lee (Massport): Are you storing the electric vehicles outside, and has that presented any issues?

Zachary Agush (RIPTA): Buses are currently being stored indoors, but RIPTA will have to consider outside storage and related challenges, such as winter weather, as the electric fleet grows.

Sarah Lee (Massport): Are there any cost savings related to electric vehicles having limited maintenance needs?

Zachary Agush (RIPTA): Yes, certain materials and maintenance practices will no longer be necessary, although there isn't enough data to support whether any cost savings have been or will be observed.

Sarah Lee (Massport): Can you share driver feedback about the electric buses?

Zachary Agush (RIPTA): Driver responses have been mixed, though driver training for electric buses is a potential hurdle that will have to be considered.

Melissa Dullea (MBTA): Did you use a charge management system or other tool to make sure that deployed buses will have enough energy to complete a trip and return?

Zachary Agush (RIPTA): Originally RIPTA was relying on the manufacturer's system but has since purchased a third-party software called VeriCiti that shows real-time charge status and block assignments of vehicles. They do not currently have software to monitor the chargers themselves but are looking into this.

Melissa Dullea (MBTA): How do you allocate time for vehicle layovers, and are you considering charging time?

Zachary Agush (RIPTA): The R-Line's route length and large number of vehicles easily allowed buses to be re-routed to the indoor charging facility without interfering much with layovers and timing, though it may be more difficult to alter other routes, so RIPTA is considering route alteration and management as it expands the electric fleet.

Melissa Dullea (MBTA): How did you decide between depot charging versus terminal charging, how many chargers do you have, and how many buses are typically charging at once?

Zachary Agush (RIPTA): Depot charging was ruled out because the electric buses were not holding a charge for their full routes, especially in the winter, so RIPTA worked with a consultant to determine the ideal number and locations of on-route chargers.

Melissa Dullea (MBTA): How long does it take to charge vehicles using the on-route chargers?

Zachary Agush (RIPTA): Generally charging takes 7-9 minutes, assuming the battery is nearly dead. RIPTA is purchasing vehicles with somewhat smaller batteries because it has a large enough fleet that each bus can charge every time it returns to the terminal or at least every other trip.

Marc Older: Do you have information on how much cold and hot weather penalties are due to controlling temperature on the bus and how much is due to reduced battery efficiency?

Zachary Agush (RIPTA): Data from the monitoring software show that on days when the temperature is below 40 degrees Fahrenheit the state of charge goes down faster, which impacts the number of miles the bus can travel. Every time the bus door opens or closes, more energy is needed to re-heat the bus as well. Battery efficiency is likely not the issue, though battery technology is rapidly developing and improving.

Tim Hazelton (MBTA): How do you manage and convey planned recharging activities?

Zachary Agush (RIPTA): Most depot recharging is being done by utility staff, though driver training will be necessary as on-route chargers are implemented.

Conclusion and Upcoming Events

S. Johnston thanked everyone for their participation and mentioned upcoming Transit Working Group events, including a coffee chat on Human Services Transportation on March 10, 2022, and a coffee chat on Confronting the Driver Recruitment Shortfall with the Transit Workforce Center on April 6, 2022.

Attendance

Attendee	Affiliation
Joseph Mech	Brockton Area Transit (BAT)
Sarah Lee	Massport
Caitlin Allen-Connelly	A Better City
James Nee	MASCO
Melissa Dullea	Massachusetts Bay Transportation Authority (MBTA)
Megan Rhodes	Franklin Regional Council of Governments (FRCOG)
Lisa Weber	Human Services Transportation Office (HST)
Jeff Bennett	128 Business Council
Nahrin Sangkagalo	Central Massachusetts Regional Planning Commission (CMRPC)
Zachary Agush	Rhode Island Public Transit Authority (RIPTA)
Marc Older	N/A
Tim Hazelton	Massachusetts Bay Transportation Authority (MBTA)
Leslie Zebrowitz	Brandeis University
Steven Olanoff	Boston Region Metropolitan Planning Organization; Three Rivers Interlocal Council
Susan Barrett	Town of Lexington
Andrew Jennings	Town of Billerica; Lowell Regional Transit Authority (LRTA)
Peter Pelletier	Town of Medway
Edward Bates	MassDOT
Sarah Ingle	Rhode Island Public Transit Authority (RIPTA)
Jay Flynn	Transit Matters

MPO Staff/Central Transportation Planning Staff

Stella Jordan
Sandy Johnston

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