

Zero-Emission Transition Twitter Chat April 10, 2019

Summary

Jennifer Fundora, Associate, [Center for Transportation and the Environment \(CTE\)](#), moderated a rousing [#ZeroEmissionTransition](#) Twitter Chat on April 10, 2019. Jennifer was joined by a team of experts at CTE. The chat focused on ways to improve the health of our climate and communities through clean, efficient, and sustainable transportation technologies, with a focus on rural and tribal transit.

Visit the [chat transcript](#) (scroll to 4/10/19) for questions asked during the chat and attendees' replies. We have also provided answers to questions received after the chat below.

Question 1: To get a feel for the room: what is your level of experience with zero-emission buses (ZEBs)? A low-emission bus operates using efficient/alternative fuels rather than just a diesel engine. A ZEB is either battery or fuel cell electric.

14 Responses

36%	Interested in learning more
0%	Currently procuring ZEBs
7%	Have ZEBs in service
57%	In the ZEB industry

Question 2: What general advice would you give to transit agencies looking to purchase and deploy a low-emission or zero-emission bus?

Answers:

- Plan! Plan! Plan! Before you choose a bus type or charging/fueling scheme, investigate what electric bus works best for your route.
- Consider your long-term goals from Day 1! Better to conceive and build out electrical infrastructure at one time to support the electric fleet you want in the future.

- Investigate both battery electric and fuel cell electric buses for your application: The decision between the two ZEB options – battery electric or fuel cell electric – depends on a number of factors.
- Read all about it! National RTAP's library contains many helpful resources on ZEBs, like Frontier Group/US PIRG's report, [Electric Buses: Clean Transportation for Healthier Neighborhoods and Cleaner Air](#).
- Battery electric buses are a prime candidate as a starter ZEB, and are great for city routes with short, consistent loops. The City of [Seneca, South Carolina](#) is the US's fully electric bus fleet.
- Fuel cell electric buses are great for large elevation changes, cold temperatures, and longer routes. BRT and express buses benefit from the added fuel source hydrogen provides. [MTD](#) is currently working on procuring fuel cell buses.
- Involve your utilities company early! Some companies are offering infrastructure subsidies as an incentive to try ZEBs. [Portland General Electric](#) is paying charger costs for [Trimet](#) for five of their ZEBs, a project CTE is currently managing.
- Transit agencies like [Foothill Transit](#) in California negotiated with its utility for lower demand charges during its electric bus pilot.
- Rural transit agencies often have the advantage of the power coming from local municipally-owned power companies. This could potentially allow for more flexibility in providing electricity and associated infrastructure at favorable costs.
- Smart charging is key, Smart charging helps level your energy demand and saves your agency money.

Question 3: According to APTA data, the US has nearly 6,800 public transit agencies, including 820 that operate in large urbanized areas and approximately 1,400 agencies that operate in rural areas and small towns. What are some of the differences in the needs of rural bus electrification vs. urban bus electrification?

Answers:

- NCHRP's [Small System Alternative Fuel Strategies Guidance Document](#) is a good resource to educate small urban and rural transit agencies on alternative fuels.
- Rural areas tend to be more sparsely populated and trip destinations are spread out across larger distances compared to urban areas.
- For rural agencies like [SMART](#), space considerations are not as critical as in urban areas. This gives rural agencies the freedom to expand charging and refueling networks more easily than their urban counterparts.
- Rural agencies will need to plan longer routes: consider charging a ZEB at the end of the day in the bus depot, or charge intermittently using on-route charging. [Park City Transit](#) in Park City, Utah uses on-route overhead charging.
- Rural agencies also serve smaller ridership populations so cutaway buses may be a better fit. Electric cutaway buses exist for agency's looking to electrify their fleets! An example is [Lightning Systems](#) cutaway bus.
- [Clean Energy Works](#) advises that for rural areas, it may be better to start the zero-emission transition with electric school buses first as they may constitute a larger fleet than transit buses. CTE would love to see more zero-emission school buses! They're a great application

of ZEB technology. Not only are they good for the environment, they reduce air pollution risks for children.

Question 4: Because of an electric bus's lack of an internal combustion engine, ZEBs are known to be very quiet. Transit agencies: have there been any concerns or innovations on signaling/sound-making on ZEBs?

Answers:

- FTA's [Analysis of Electric Drive Technologies for Transit Applications](#) says, "Reduced Noise Makes Transit a Good Neighbor" with examples of no-noise buses.
- CTE works with transit agencies who are a part of the [Zero Emission Bus Resource Alliance \(ZEBRA\)](#). ZEBRA is an industry group where transit agencies on any part of their ZEB journey can exchange information with other transit agencies, without the involvement of manufacturers or outside groups. ZEBRA members such as [Tri Delta Transit](#), [Monterey-Salinas Transit \(MST\)](#), [OCTA](#), [County Connection](#), and [Sunline Transit Agency](#) have reported no concerns with pedestrian safety and the quiet hum of ZEBs on their roads.
- [ACT Transit](#) has been running ZEBs in revenue service for more than 12 years and are happy to report this is not an issue. ZEBs will still generate road noise from the tire/road friction, air brake system, and HVAC operation.

Question 5: If your transit agency is currently deploying low- or zero-emission buses, please share with the group any pictures or news articles of your "best moments."

Answers:

- Congratulations to [National Car Charging](#) and Jim Burness for being named a finalist in the [2019 Denver Business Journal Small Business Awards](#).
- Conferences are a great way to see and talk about ZEBs with the manufacturers. National RTAP staff took a photo of [New Flyer's](#) electric vehicle at the 2018 Tri-State Transit Conference.

Question 6: How do transit agencies get the funding for a zero-emission bus?

Answers:

- There are many programs in the US that are working with transit agencies to pay for their transition to ZEBs.
- The [Low- or No-Emission Vehicle Program](#) funds hundreds of buses through the Federal Transit Administration. This is currently an open opportunity. In National RTAP's [webinar](#) on the FTA Low No Emissions Program Grant Writing, three successful proposers tell you how they requested grants to start low or no emission programs at their systems.
- New Flyer provided a reminder that FTA Low No proposals must be submitted electronically through the [Grants.gov](#) website by May 14 at 11:59 PM EST. Make sure to get your proposals in to help support low or no-emission buses and infrastructure!
- CTE has worked with a number of transit agencies to secure funding for ZEBs and related infrastructure, and often go on to manage the project. County Connection's GILLIG electric trolley was funded by the Low-No program.

- There are also options through the [VW Clean Air Act Civil Settlement](#). \$2 billion dollars have been set aside to provide funding to transportation electrification initiatives – these amounts vary from state to state.
- One option Clean Energy Works is exploring is working with utilities who will benefit from increased electricity sales to make investments in electric buses and help offset the increased upfront costs compared to diesel. This can be used in conjunction with FTA Lo-No grants and VW Settlement funds to maximize the impact.

Question 7: How do transit agencies prepare bus operators and their maintenance team for electric buses?

Answers:

- Training bus operators to drive a ZEB is not so different from training operators to drive a fossil-fueled bus. For transit agencies that are charging the buses in the depot, the training process to drive a ZEB is similar to a diesel or CNG bus.
- For transit agencies looking to charge their buses on-route, bus operators learn how to charge their buses – whether it be hooked to a charger or wirelessly through inductive charging. Here’s an [example video](#) of the charging process for [Build Your Dream’s](#) charging station at [GTrans’s](#) bus depot.
- Here’s an [example](#) of North America’s first wireless fast-charging station at [Link Transit](#).
- For transit agencies thinking about fuel cell buses, hydrogen fueling is the same process as fueling a bus with diesel. [MBTA’s](#) fuel cell bus is being refueled with hydrogen at their [Nuvera](#) station.
- According to a [California Air Resources Board \(CARB\) report](#), ZEB maintenance is cleaner than conventional diesel buses. Because ZEBs lack an internal combustion engine, there are no oil changes required. Buses with electric drive trains have lower maintenance costs.
- While you are beginning your zero emission transition, National RTAP’s checklist of fuel-saving maintenance measures in [Vehicle Maintenance: Reducing the Cost of Fuel Consumption](#) will help your maintenance team.