

Electric Transit User Group Forum Meeting Summary

Topic: Workforce Development

Dates: June 13 and 17, 2024

The Electric Transit User Group (ETUG) regularly gathers to inform the National Renewable Energy Laboratory's (NREL) strategic direction to help address pressing needs associated with electrifying transit fleets, including technical challenges, workforce development, operations and maintenance, procurement, and other hurdles. Information collected through ETUG listening sessions generates key insights that could inform future research, technical assistance needs, and funding opportunities.

The following is a summary of the discussion and key takeaways from the June 2024 sessions on workforce development. NREL will use participant input and insights into fleet concerns to tailor its resources. NREL also plans to continue hosting listening sessions throughout FY25 on various topics to help address ongoing challenges and identify further resource gaps.

Participant Discussion Summary

Challenges With New Vehicle Models

- Outdated service manuals: Manufacturers may fail to update service manuals to reflect changes made to newer bus models, making it difficult for technicians to diagnose and repair issues.
- In-service learning: New vehicle models require technicians to learn new skills and procedures on the job.
- Lack of experience: Even factory-trained technicians may have limited experience with newer models, especially for new non-powertrain components.
- Knowledge sharing: Field service representatives often learn from transit agency technicians, highlighting the need for improved training and support.
- Time-consuming troubleshooting: Diagnosing and repairing issues with new models can be time-consuming, especially during the initial shakedown period.

Recruitment Pipeline

- Apprenticeship programs: Partnerships with vocational schools and community colleges can help create a pipeline of qualified technicians for zero-emission bus (ZEB) maintenance.
- Skill gaps: Young technicians may require additional training in workplace skills, while experienced technicians may need to learn new electrical diagnostic and computer skills.
- ZEB-specific training: Developing specialized curricula for ZEB maintenance can help address ZEB knowledge gaps.

ZEB Skills Development for Existing Technicians

- Specialized training: Consider including short-term, onsite, factory-trained technician support in procurements to accelerate knowledge transfer and address skill gaps.
- Targeted training: Identify and train mid-career technicians with an aptitude for electrical work to ensure a skilled workforce for ZEB maintenance.
- Hybrid fleet experience: Transit agencies with hybrid fleets can benefit from existing technician expertise in battery, motor, and high-voltage systems.

Key Takeaways

NREL identified the following key takeaways from the ETUG listening sessions on workforce development. NREL will seek opportunities to help address these takeaways through the lab's technical assistance offerings.

- **Ensure vehicle and maintenance documents are up to date:** Manufacturers may fail to update service manuals to reflect changes made to ZEB models, leading to difficulties in diagnostics, troubleshooting, and repairs. Transit agencies may wish to consider adding contractual requirements for timely updates to service manuals to ensure accurate and up-to-date information.
- **Expand workforce development training:** The industry faces a significant shortage of qualified technicians with expertise in ZEB technologies, particularly hydrogen fuel cells. Addressing this knowledge gap requires increased investment in training programs, standardized curricula, and innovative training methods.
- **Account for technician learning curve:** Introducing a new vehicle model to a fleet can require significant additional technician time for troubleshooting and diagnostics, especially for newer designs. Transit agencies could consider budgeting for dedicated technician time and potentially embedding factory-trained technicians during the initial shakedown period.
- **Standardize charging systems:** Transit agencies face challenges in obtaining timely service for DC fast charging hardware due to limited technician availability. As the consumer retail DC fast charging industry grows, more qualified technicians may become available to serve that equipment. Transit agencies should prioritize long-term access to maintenance support when selecting charging hardware and vendors.