Transit Research & Hydrogen Fuel Cells

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Key Topics in Public Transit Research

- This discussion introduces selected programs supported by the FTA research office that may be of interest to the hydrogen and fuel cell technology industry.
FTA Research – Overview

- Legacy Programs & Projects
- Recent Congressional Legislation
- Agency & Departmental Priorities

FTA Research Today
FTA Research – Overview

• **Legacy Programs**
  – National Fuel Cell Bus Program
  – LoNo Program 2013-15

• **Recent Congressional Legislation**
  – Low or No Emission Program 2016-Present
  – LoNo Component Testing
  – Expansion of FTA’s Bus Testing Program

• **Agency and Departmental Priorities**
  – Safety, Innovation, Efficiency
Fuel Cell Bus Program

• In 2005 Congress created FTA’s National Fuel Cell Bus Program, signed by President Bush, to advance the commercialization of fuel cell buses
• Funded for 7 years - 2006-2012 ~ $13 million per year, ~$90 million total
Fuel Cell Bus Program 2019

- All funding obligated
- 5+ remaining active projects, all involving bus operations support, several with extensions
  - 1. New Flyer 60’ FC Bus
  - 2. Two FC Buses in Ohio
  - 3. Battery Dominant FC Bus
  - 4. FC Bus in Orange County, CA
  - 5. AC Transit FC Bus Fleet Support
-- Plus support to National Renewable Energy Laboratory (NREL) for evaluations
Fuel Cell Bus Program 2019

Final program activity is in Ohio and California

- Stark Area Regional Transit Authority
- AC Transit
- OCTA
- Sunline
NREL Evaluations

• FTA, with support from DoE, funds bus evaluations by the National Renewable Energy Lab

• NREL provides evaluations of real-world technology bus performance

• NREL gathers data on a variety of metrics of both new technology buses and conventional technology as baseline
  – Maintenance costs
  – Operating costs
  – Reliability (Miles Between Roadcalls)

• Consistency over time and across projects ensures data confidence and comparability
LoNo 2013-2015

• Low or No Emission Vehicle Deployment Program
  – Funded from the FTA Research Budget (Section 5312) for the purchase of clean transit vehicles
  – 17 Projects, $77.5M, 111 buses, mostly battery-electrics
  – Includes 13 Fuel Cell Buses at SARTA & Sunline
  – The performance of the SARTA buses is being evaluated by NREL
Low-No 2016 to Present

• Low or No Emission Vehicle Deployment Program
  – Funded from FTA’s Bus Capital Program (Section 5339) until 2020
  – So far, three years, 2016-18:
    • 123 projects, $195M
    • Including 2 fuel cell buses pending delivery, one at SARTA, and one at Champaign-Urbana
  – https://www.transit.dot.gov/funding/grants/lowno
LoNo CAP

• Low and No Emission Component Assessment Program (LoNo-CAP)
• Up to $3M/year, total
• Auburn University and Ohio State
• FTA pays 50% of the cost for the testing of bus components including batteries, fuel cells, power management
  – Tests maintainability, reliability, performance, structural integrity, efficiency, and noise
• Voluntary, no passing or failing scores
Bus Testing

- FTA’s Model Bus Testing Program (Altoona Testing) tests new transit bus models for
  - safety
  - structural integrity and durability
  - reliability
  - performance (including brakes)
  - maintainability
  - noise
  - fuel economy and emissions
Bus Testing cont’d

- To be eligible for purchase a transit bus using FTA funds, buses must receive a passing score
- Until the FAST Act, bus testing occurred at Penn State only (Altoona Testing)
- Now, testing is being expanded to include Ohio State and Auburn Universities
- This presents a challenge to ensure all three facilities are identical in capability and procedures
Bus Testing & LoNo-CAP

• As a result of the need to coordinate three centers, as well as the ongoing work under LoNo-CAP, FTA has the opportunity to support innovative research effort going forward focused on facilitating bus and component testing and research.
Thanks!

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