Fuel Cell Buses in US Transit Service

Vincent Valdes
Associate Administrator
Office of Research, Demonstration and Innovation

April 2019
Department of Energy
Annual Merit Review
Fuel Cell (FC) Buses in Transit Service
US Zero Emission Bus Operations

• The Big Picture
  – Public transit faces immense challenges in the 21st century.
  – Increasing realization that the zero emission bus technology is critical to urban transportation, and local governments positioning themselves accordingly.
  – Battery electric is not the only way to deliver zero emission transit fleet service. The fuel cell bus is a strong alternative candidate.
  – Still too early to draw final conclusions about the optimal zero emission technology fleet composition.
US Fuel Cell Bus Operators
(5 or more FC buses)

• Key Points
  – Overall: Success and expansion.
  – While there are challenges, fuel cell technology works well in transit service applications.
  – US Fuel Cell bus operators increasing from three to four.
  – All current operators are expanding their fuel cell bus fleets.
US Fuel Cell Bus Operators - 2019

- AC Transit
- Orange County Transit
- Sunline Transit
- Stark Area Regional Transit Authority
Vehicle Service Availability

• Key performance metric - Vehicle Service Availability

• Fuel cell bus comparison to other technologies.

• With support from DoE and FTA’s research office NREL has been collecting service availability data on four FC bus fleet operators.
Vehicle Service Availability – cont’d.

- Data shows that fuel cell technology “downtime” is comparable to other established technology.
- Availability for FC buses as a whole averages 72% compared to 90% for diesel -
  - Problems with the fuel cell systems themselves cause only 25% of service unavailability.
  - Problems may be caused by low production levels of FC bus models
Hydrogen Fueling

• Hydrogen fuel remains a significant challenge for transit agencies.
• Reducing fueling costs remains a key part of making fuel cell buses competitive.
• FTA is open to working with DoE and exploring private sector infrastructure partnerships to examine ways to expand access to hydrogen fueling for public agencies.
Conclusions

• Public transportation faces a unique combination of challenges in the 21st century.

• Zero emission bus fleets in the US are currently too small to draw final conclusions about the optimal technology fleet composition.

• Fuel cell technology continues to show promise in terms of technological maturity and operational efficiency to deliver transit service.