FTA

FEDERAL TRANSIT ADMINISTRATION

Fuel Cell Buses in US Transit Service

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Fuel Cell (FC) Buses in Transit Service

US Zero Emission Bus Operations

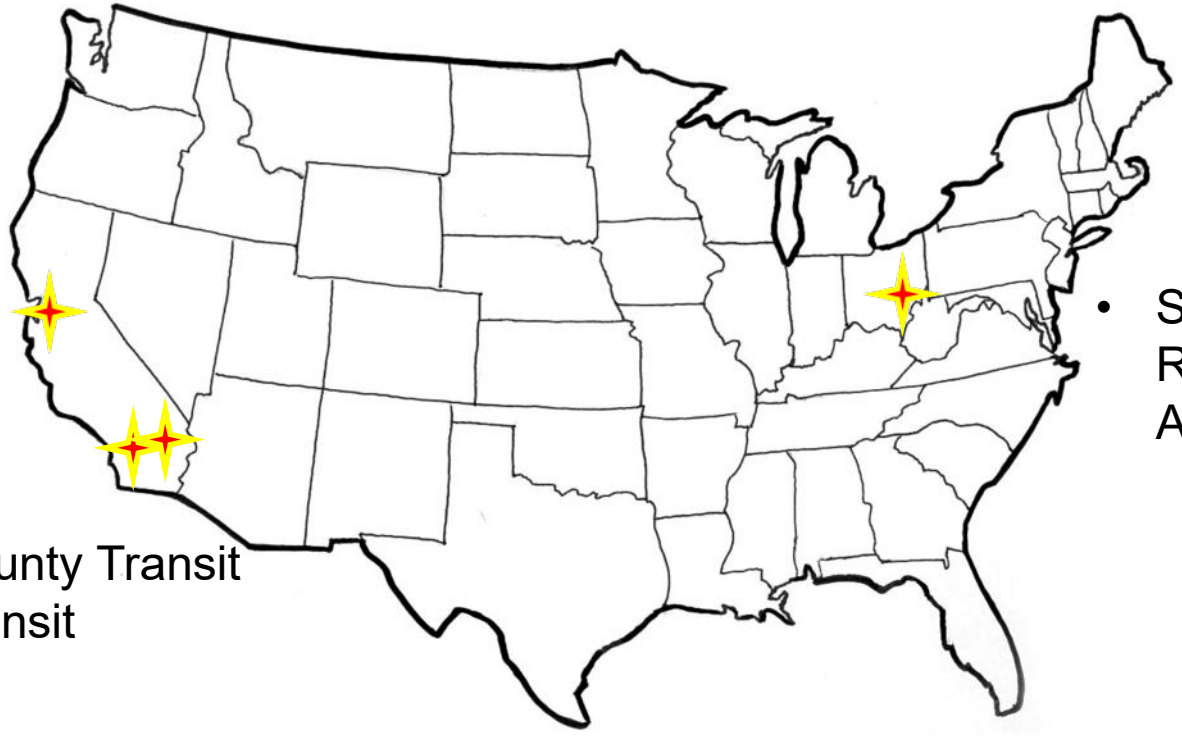
- The Big Picture
  - Public transit faces immense challenges in the 21st century.
  - Increasing realization that the zero emission bus technology is critical to urban transportation, and local governments positioning themselves accordingly.
  - Battery electric is not the only way to deliver zero emission 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.