Hydrogen and Fuel Cell Electric Vehicles

Busworld Academy
January 13, 2020
About CTE

**Mission:** To advance clean, sustainable, innovative transportation and energy technologies

**501(3)(c) non-profit** engineering and planning firm

**Portfolio - >$500 million**
- Research, demonstration, transition planning, deployment
- **86 Active Projects Nationwide** Totaling over **$300 million**

**Focused on Zero-Emission Technologies**

**National Presence**
Atlanta, Berkeley, Los Angeles, Minneapolis/St. Paul
Fuel Cell Electric and H₂ Projects

- Class 6 Trucks
- Class 8 Drayage Trucks
- Marine Cargo Top Loader
- 40’ and 60’ Transit Buses
- HD and LD H₂ Stations
Hydrogen is a Commodity
Hydrogen Delivery
Fueling Station Evolution

Future: Underground LH2 Tanks and Pumps

12- to 15-Bus Capacity; Expand to 30+ Buses

40’ x 60’ (50-Bus Capacity)

Parallel Fueling
U.S. Fuel Cell Electric Buses

Fuel Cell Transit Buses in the United States

- **Illinois: 2**
  - Planned: 2 Buses
  - Champaign-Urbana

- **Michigan: 2**
  - Current: 2 Buses
  - Flint

- **Massachusetts: 1**
  - Current: 1 Bus
  - Boston

- **California: 54**
  - Current: 25 Buses
    - San Francisco Bay Area (13), Thousand Palms (10), Santa Ana (1), Irvine (1).
  - Planned: 29 Buses
    - Oakland (11), Santa Ana (10), Thousand Palms (8).

- **Ohio: 12**
  - Current: 6 Buses
    - Canton, Columbus
  - Planned: 6 Buses
    - Canton

Source: DOE and NREL
Worldwide Acceptance: 2,000 by 2020

Fuel Cell Buses Worldwide

Over 10 million miles of proven service worldwide: 3 million miles at AC Transit and over 1 million at SunLine Transit.