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RECD. FEB 17 2009



# The Future of Public Transport – In Pursuit of Zero Emissions

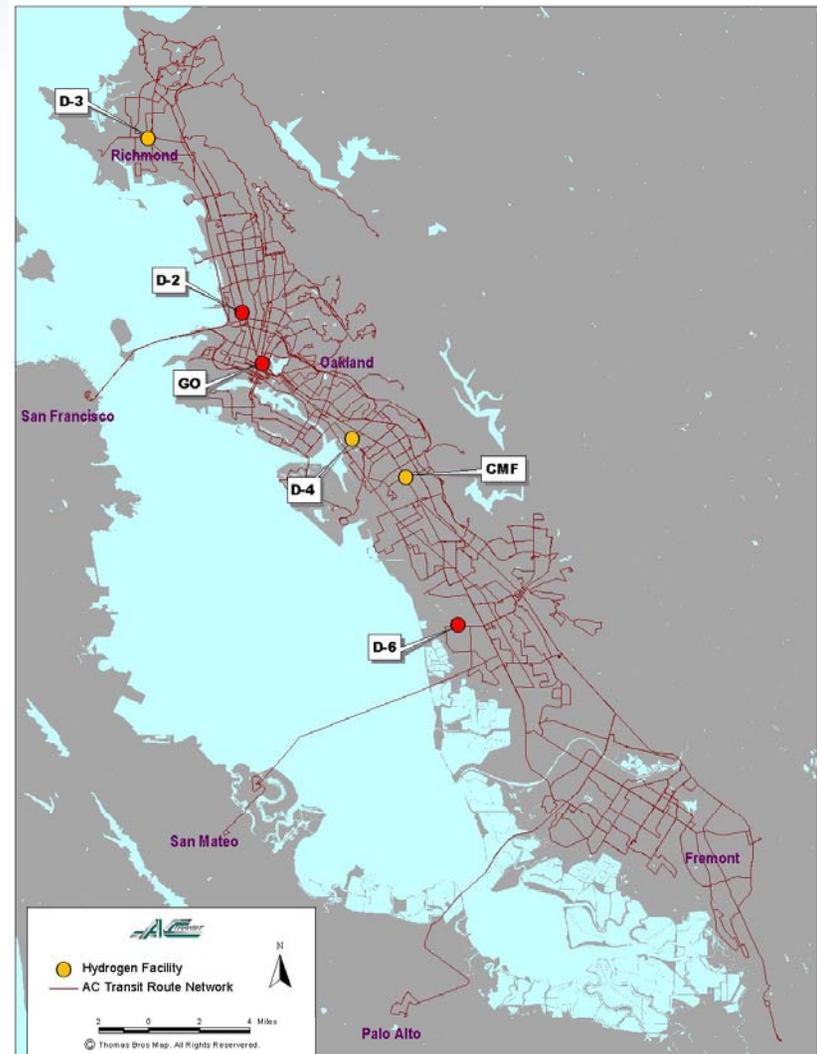
Jaimie Levin





# AC Transit

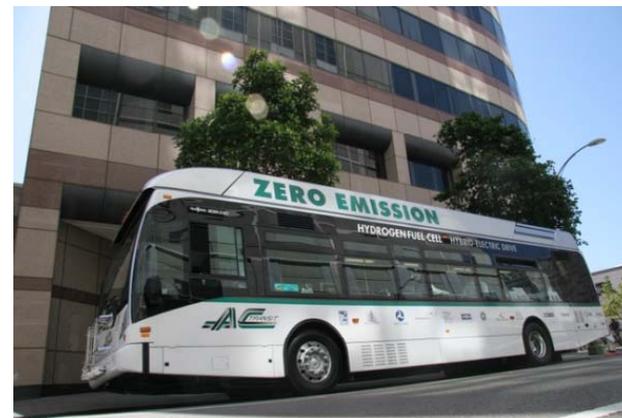
- **Serving 1.5 million people in 13 cities**
- **67 million passengers**
- **630 buses**
- 2,190 employees
- \$325 million budget
- 105 lines (27 transbay)





# Getting Started with Hydrogen

- Under Development **Since November 1999**
- Member of ***California Fuel Cell Partnership***
- Member of ***National Hydrogen Association***
- Member of ***California H<sub>2</sub> Business Council***
- Member of ***California Climate Action Registry***  
and ***Climate Registry***





# Phase 1 – 26 Partners – \$21 Million



**UTC Power**  
A United Technologies Company

California Environmental Protection Agency  
**Air Resources Board**





# Performance

- 142,000 Miles (as of 02/09/09)
- 360,000 Passengers
- 72% to 100% Better Fuel Economy
- -174 Tons of CO<sub>2</sub>
- -34,000 Gallons of Diesel





## Passenger Survey – 493 Passengers

- Funded by Federal Transit Administration
- **ACT's Fuel Cell Program – 84% Positive**
- Program's Effect on Opinion of Local Government – **70% Improved**
- Importance of Considering Alternative Fuels – **90% Yes**
- Support **Expanded Fuel Cell Bus Program** at AC Transit – **81% Yes**



# Richmond Hydrogen Station

- Startup – October 2002; De-commissioned Jan 2008
- Electrolysis – 24 kg/day; 47 kg storage
- **7,000 kg** dispensed
- No safety incidents





# Oakland Energy Station



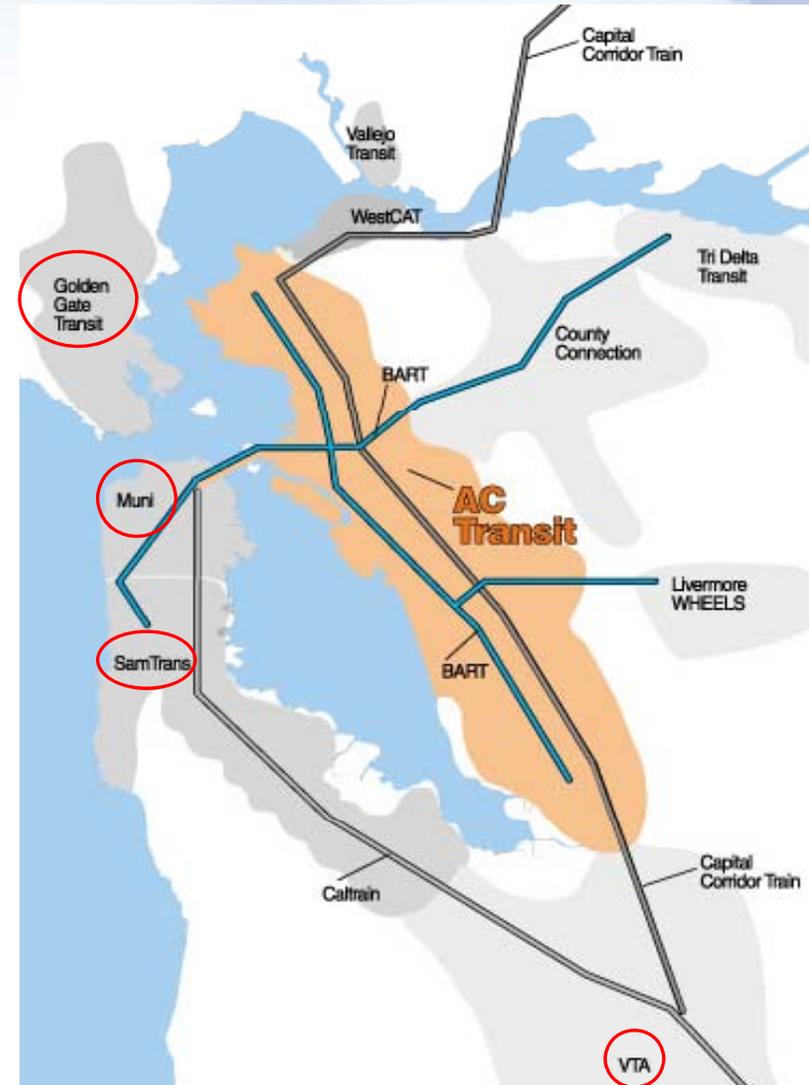
- Startup – November 2005
- Natural Gas Steam Reformer
- 150 kg/day; 366 kg Storage
- **31,000 kg** dispensed (as of 02/09/09)
- No safety incidents





# Bay Area Demo

- Phase 2 - \$45 Million
- 12 New Buses in 2009/2010
- 5 Transit Agencies (>2,500 vehicles)
- Shared Service
- Shared Training







# Emeryville Energy Station



- Reformer –  $\approx$  180 kg/day
- Solar Electrolysis – 60 kg/day
- $\approx$  500 to 800 kg Storage
- Up to six buses
- Maximum 20 cars per day
- Startup – 1<sup>st</sup>Q/2<sup>nd</sup>Q 2010
- Toyota, Daimler, Hyundai, GM, and Honda participating



## Advance Demo – What’s Next?

Next Steps	Comment
12 Next-Generation Buses in Service by June 2010	Additional grant funds needed to support Hydrogen Facility Development
Evaluation Criteria	<ol style="list-style-type: none"><li>1. Performance by different operators</li><li>2. Fuel economy</li><li>3. <b>RELIABILITY</b></li><li>4. Hydrogen Production</li></ol>
<b>Center(s) of Excellence</b>	Next-stage Demo of 25 to 50 buses
Evaluation Criteria	<ol style="list-style-type: none"><li>1. Reliability</li><li>2. <b>DURABILITY</b></li><li>3. Hydrogen Production</li></ol>
Cost	Additional grant funds needed to support Center(s) of Excellence



# International Commitment



EUROPEAN COMMISSION  
EUROPEAN RESEARCH AREA



Brussels, 14 October 2008

Developing New Energy for the future: **Europe launches a 1 billion Euro project to get into pole position for the Fuel cells and Hydrogen race**