SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

East West Freight Corridor Zero-Emission Technology Strategy

Status Update

Michael Fischer
Gill Hicks
September 8, 2011

Factors Driving This Assessment

- Impending 2023 regional attainment deadlines
- Achieving zero emissions in the goods movement sector will be important
- No strategy yet to introduce sufficient zero-emission vehicles to meet 2023 goals (and beyond)

Zero-Emission vehicle technology may offer a solution to achieve regional air quality goals.

2

A Two Pronged Approach

1. An aggressive program to bring more clean fuel / hybrid trucks into service represents the best near-term strategy.

2. A regional freight corridor program represents an opportunity to commercialize Zero-Emission Technologies (ZET), and build incentives into an existing program (e.g. the RTP).

3

Ongoing Comparison of Technologies

Zero-Emission Technologies		
On-Vehicle Energy Storage ⟹ Electric Motor	100% Battery	*Both require recharging replacement/ disposal infrastructure*
	100% Hydrogen Fuel Cell (or equal/better)	
Wayside Energy Distribution on Guideway	Electric Traction power ⟹ Propulsion / Battery Recharge (overhead catenary or embedded electromagnetic induction)	*Both require: On-vehicle energy storage when off guideway and Power generation and transmission infrastructure*
	Embedded Linear Synchronous Motor ⟹ Reactive Propulsion	

Early Indicators Favor Wayside Power Generation

Fixed guideway systems (i.e. rail, maglev)
- Consume inordinate real estate
- Inflexible- do not serve dispersed origins / destinations
- Inappropriate to serve diverse markets

Current battery technologies
- Restrained by energy storage capability – limits operating range

Wayside Power
- Extends the range of battery, may enable simultaneous battery charging
- May not be restricted to freight corridors
- Potentially less expensive

Markets favor independent ZET trucks (100% battery, 100% fuel cell, or hybrid with wayside-powered guideway)

Range Extended with Wayside Power

- Currently deployed at some Port of Los Angeles terminals
- Deliver loaded 40-foot container up to 30 miles
- Top speed is 40 MPH
- Performance should improve as technology matures
- Slow battery charge systems

- Overhead or embedded conductor on freeway dedicated truck lanes
- Can significantly extend ranges for electric trucks across region and increase vehicle availability through on-road charging
- May be transitional technology until longer range/quick charge battery systems
- Zero local emissions

6

Recommendations

- Develop a program around building a freight corridor with wayside power
- Assume that hybrid vehicles use wayside power – increase markets served by corridor
- Include wayside power into project costs of RTP
- Consider including purchase subsidy
- Develop a rapid development and commercialization program in parallel with pre-construction project development (CALSTART CARGO)

7

Early Commercialization Activities

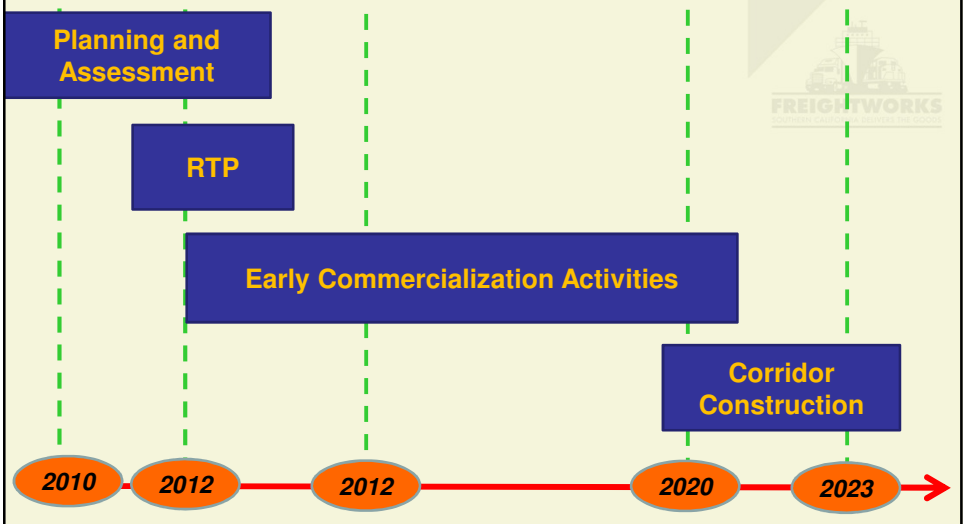
Short Term
- Stakeholder surveys – needs, concerns, etc.
- Outline technical / market needs
- Continued assessment / comparison of technologies

Mid-Term
- Create RFP / Call for vendor submissions
- Develop key performance parameters
- Create group of potential collaborators / other regions interested in technologies

Long-Term
- Possible demonstration projects
- Study incentives / funding and regulatory issues
- Select technology and vendor
- Deploy on a limited basis

8

Corridor Timeline



9

Continuing Assessment

- Develop an RTP assuming wayside power
  - Continue assessing other technologies for implementation
- Cost estimates for a Zero-Emission Technology
- Determine implementation responsibilities and milestones
- Assess possible funding sources
  - Investigate potential for private investment
- Address phase- in of technologies (including level of penetration by technology)
- Coordinate with other ongoing Zero-Emission efforts (I-710, CALSTART CARGO (e.g.), etc)

10