



Foothill Transit

F2005

29 FUTURE MARKET PL

ECOLINER ELECTRIC BUS OVERVIEW AND LESSONS LEARNED



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ABOUT Foothill TRANSIT



- 327 sq. mi service area (847 km²), 1.5m service pop.
- 14.6 Million boardings per year, 40,000/day.
- 36 local and express routes.
- 315 CNG buses, 15 electric buses.
- Innovation is part of our core mission.



ECOLINER HISTORY

2009

\$6.5 million awarded to launch Ecoliner Program.

2010

First three buses deployed.

2011

\$10.2M Federal award for 12 additional buses.

2014

12 electric buses deployed, Line 291 fully electrified.

2015

Orders placed for 2 fast-charge and 13 extended range buses





ABOUT OUR ELECTRIC BUS FLEET

Our Current Fleet:

- 15 35-foot fast charge electric buses in operation. 2 more in March!
- One route fully electrified (7 buses peak service), a second route partially electrified.
- On-route charging allows for continuous operation.



ABOUT OUR CHARGING STATION



- One high power fast-charge station with two overhead chargers, sufficient to serve all buses.
- 79,000 charge cycles to-date.
- Station located at central hub off-street flexibility, safety and security.



VEHICLE RELIABILITY



- Reliability is on par with our CNG fleet
- PM is cheaper, no oil or consumables
- Technology is mature and reliable!





OVERCOMING RANGE LIMITATIONS

Our Current Fleet:

- Plan ahead: analyze routes, build a route plan.
- Build schedule accommodating charge times and delays.
- This converts an unknown technology risk (battery life) into a known operations challenge.



OVERCOMING HIGH FUEL COSTS

Our electricity costs 65% higher than CNG (per mile)

Starting Jan 2016, we're incurring demand charges.

We charge during daytime peaks at high power rates.

35% of our total bill is demand charges.

	Electric	CNG	Diesel
Fuel price	\$0.18/kWh	\$0.93/gal	\$3.00/gal
MPG	2.16 kWh/mi	4.04 MPG	4.25 MPG
\$/mi	\$0.38/mi	\$0.23/mi	\$0.71/mi



STRATEGIES TO LOWER ELECTRICITY COSTS



- Low Carbon Fuel Standard reduces costs by 20%
- Onboard software manages power peaks, reduces cost
- Off grid options like solar may be less expensive.



FAST CHARGE STRENGTHS AND WEAKNESSES

Strengths:

- Technology is ready for revenue service.
- All day operation.
- No range limits.
- Integrates well into daily operation.

Weaknesses

- Not compatible with all routes.
- Limited to routes that connect with a fast charger.
- Electricity costs must be watched and managed.





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