

# West Coast Electric Highway Partnership Project

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# Presentation Overview:

- West Coast Green Highway Initiative
- Electric Vehicles and Charging Network
- WSDOT's Electric Highways Project
- Project Status
- Questions and Answers





## WEST COAST GREEN HIGHWAY

### Transforming I-5 with Cleaner, Smarter Transportation

- Public/private partnerships to promote sustainable transportation solutions in the I-5 corridor
- Provide travelers with alternative fuels, “BC to Baja”
- Tri-State initiative (Washington, Oregon, and California) and agreement with province of British Columbia
- Partnerships between state DOTs, existing businesses and fuel providers, emerging technologies, and travelers
- Components: Alliance; Business and Marketing assistance, Branding; Fueling and Charging stations.



# 2008 WSDOT Alternative Fuels Corridor Economic Feasibility Study:

“The primary challenge to Alternative Fuels commercialization is how to build a market – simultaneously – for *new vehicle technologies*, *new fuels*, and *new infrastructure* to support them.”

## Comparative Costs for Alternative Fueling Stations

	Land & Building	Fueling Equipment	Supply Chain
Gasoline	\$1,348,500	\$571,000	Established
Biodiesel	“ “ or Co-located	\$127,000*	Limitations
Hydrogen	“ “ or Co-located	\$318,000	Not Established
Electricity	Kiosk format	\$50,000 - \$100,000**	Grid

\* Number of pumps scaled for smaller initial demand

\*\* Upper range includes utility connections and necessary upgrades

# Presidential and Federal Support

*“This ‘green freeway’ you’re planning... would link your states with a network of rest stops that allow you to do more than just grab a cup of coffee, but also charge your car.”*

- President Obama  
3/19/2009



**President Barack Obama**

Goal: 1 million electric vehicles by 2015

# US Dept of Energy's Transportation Electrification Grant: \$200+ million for EV Infrastructure

## THE Project



### Nation-wide:

**14,000** Level 2 (240V) chargers

**300 - 400** DC Fast Charger (480V) ports

**5,700** Nissan LEAF cars

**2,600** Chevrolet Volt cars

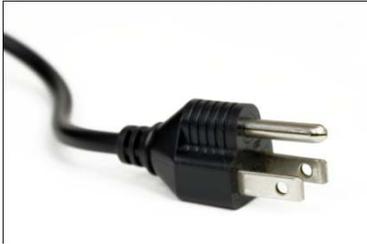
**60+** project partners

**1,200** new jobs by 2012 and

**5,500** new jobs by 2017

**18** major cities and metropolitan areas

# Charging Options and Time to Fully Recharge



## 120 V (Level 1)

- Slow, but works with a standard outlet, adequate for long layovers, may take 16-20 hours to fully recharge



## 240V (Level 2)

- Home recharging, requires a charging unit to be installed, typical 4-6 hour recharging time
- Works for public charging at places where you WANT to be for a few hours (dining, entertainment, workplace)



## DC Fast-Charging

- 20 minutes for about 80 miles of range, may allow for extended driving distances
- Requires serious and expensive charging unit and installation

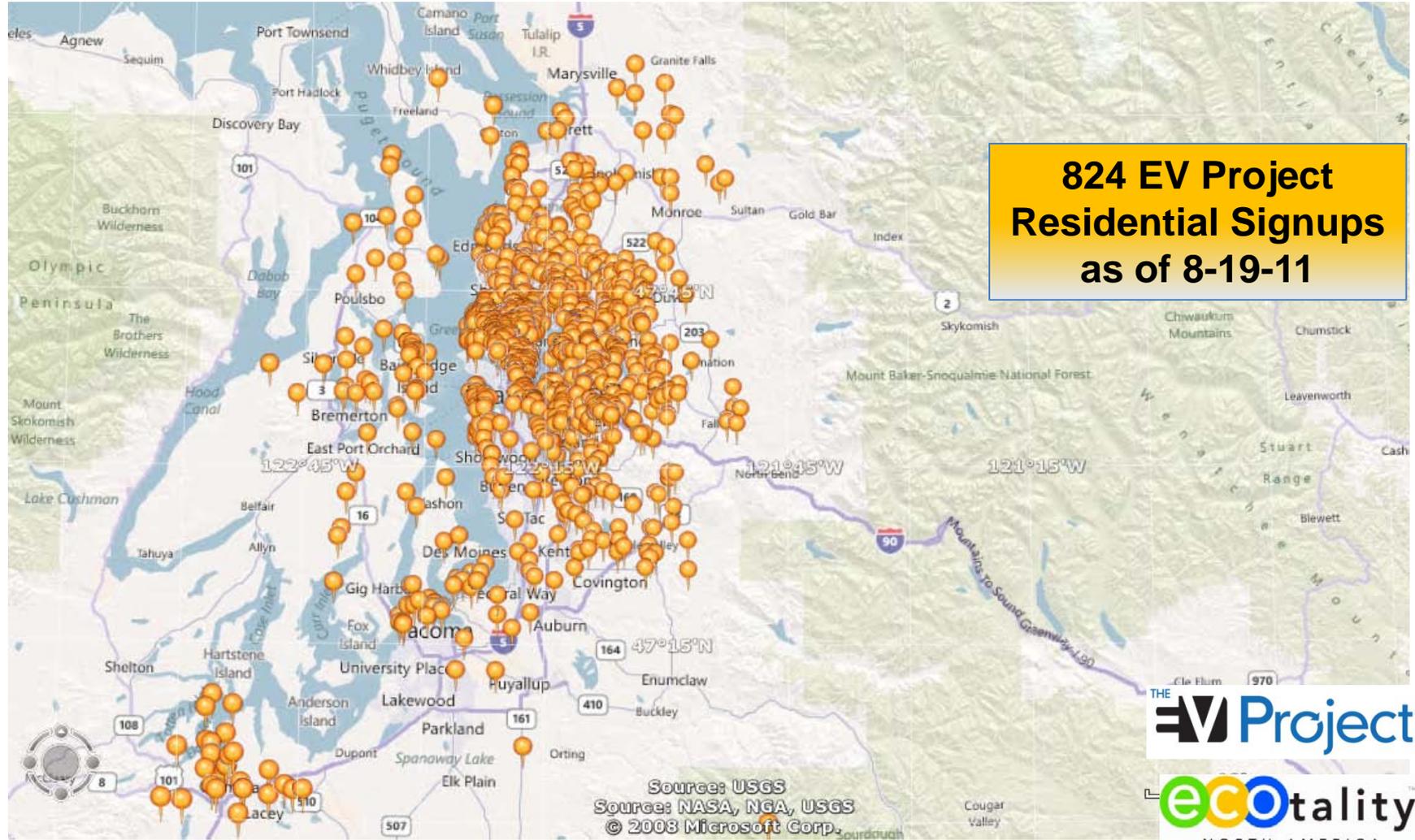
# Nissan Leaf Range and Vehicle Efficiency

Speed and Driving Conditions	Outside Temp (F)	Accessories	Estimated Range (mi)	Vehicle Efficiency (mi/kWh)*
Cruising 38 mph	68°	None	138	5.75
Fairly steady 24 mph City traffic	77°	None	105	4.38
Steady 55 mph Highway	95°	A/C on	70	2.91
Crawling 15 mph Stop-and-go	14°	Heater on	62	2.60
Average 6 mph Heavy stop-and-go	86°	A/C on	47	1.96

Nissan LEAF has a 24 kWh battery Source: "Nissan Agrees - EV Mileage Will Vary; Leaf Tests Show 91-Mile Variation." Green Car Advisor – edmunds.com. June 15, 2010.

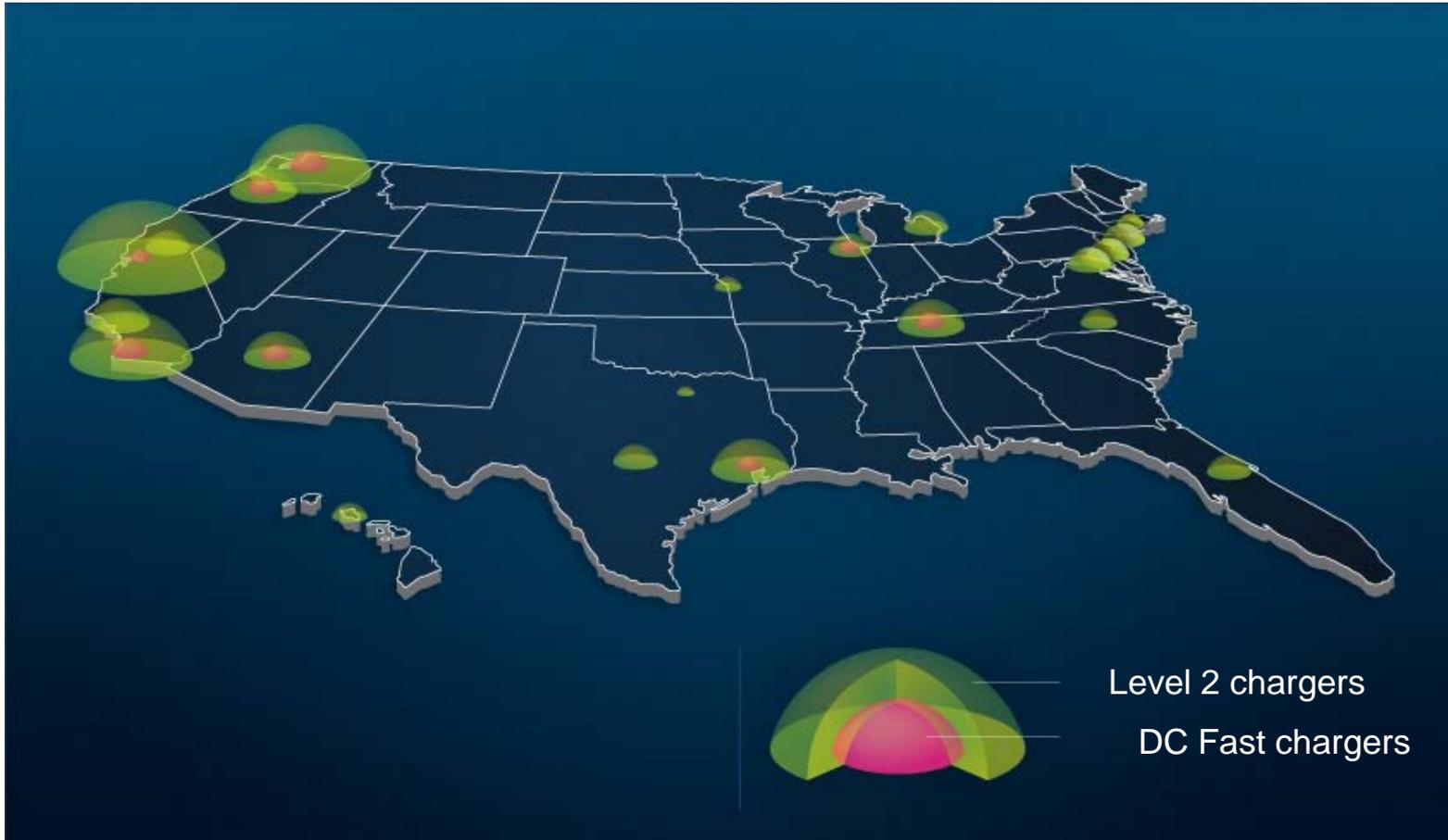
# ECotality's Progress in Central Puget Sound

(project boundary)





# Washington, Oregon and California as EV Leaders



Graphics courtesy of Nissan, February 2011

# Electric Highways Partnership Approach

- ✓ Identified targeted Recharge Zones
- ✓ Selected DBFOM contractor (AeroVironment) using fixed-price, variable scope method
- ✓ Identified business partners to serve as host sites
- ✓ Installing both a DC Fast Charger and a Level 2 pedestal at each location
- AeroVironment will operate and maintain the charge stations



DC Fast Charger  
(CHAdEMO)

Level 2 EVSE

# Business Risks Transferred through Public/Private Partnership

**Cost of equipment and services:** federal tax credit crunch; networking & Point-of-Sale costs .

**Commercial market for charging services:** fee structure for charging services.

**Property leases:** site-by-site negotiations; lack of willing partners in key areas.

**Cost of utility upgrades and interconnection:** beholden to engineering requirements and prices dictated by electric power utilities.

**Cost of electricity:** demand charges.

**Evolving technologies & standards:** new vehicles; evolving battery technologies; lack of consensus on fast-charging standards.

# Bellingham Ground-breaking at Sehome Village

Starbucks & REI

1



2010 Initial Site

2



2011 Ground-breaking

3



2011 Construction

4







# Branding the West Coast Electric Highway



Federal Highway Administration approval to test alternate **EV charging station symbol** for highway way finder signs.



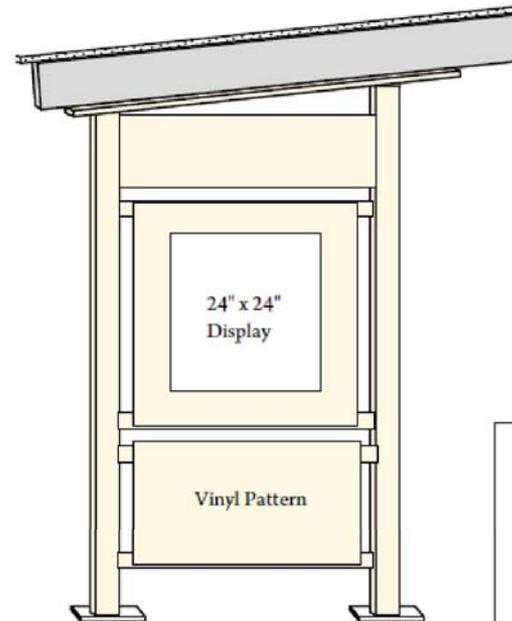
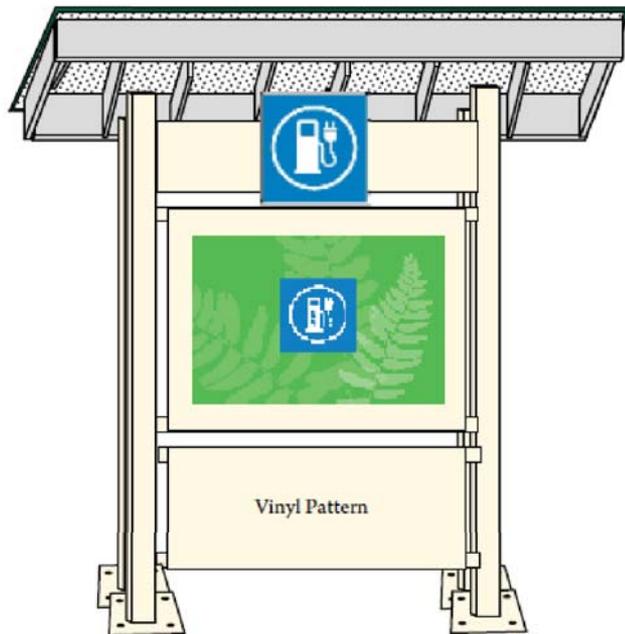
WEST COAST  
ELECTRIC  
HIGHWAY

West Coast partnership to develop consistent signage, branding, and EV driver experience along I-5.

# West Coast Electric Highway: Largest multi-state Fast-charging Network in North America



# Technology Demonstration at Two “Gateway” Rest Areas



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# Questions?

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