Electric Vehicle Charging Network

Presentation to the
Transportation Electrification Executive
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Office of Innovative Partnerships
EVs are Coming
Nissan LEAF
Ford Focus and Transit Connect
Th!nk
Navistar “E-Star”
Chevy Volt
Mitsubishi iMiEV
Electric SMART car
Plug-in Prius
Why Charging Infrastructure?

- The biggest limitation for EV drivers is the RANGE of the vehicles – “range anxiety”
- A reliable network EV Charging Stations will encourage people to invest in new technologies
- Oregon is encouraging experimentation with various makers and business models for EV charging infrastructure
- “Chicken and Egg” phenomena ➔
- 75-80% of charging will be residential
# EV Charging Stations

<table>
<thead>
<tr>
<th>Level</th>
<th>Input Voltage</th>
<th>Typical Charging Time</th>
<th>Breaker Size (A)</th>
<th>Electrical Loads (kW)</th>
<th>Typical Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>120 V</td>
<td>8 – 12 hours</td>
<td>15-20</td>
<td>2</td>
<td>Standard 120 volt plug; NEV/Motorcycle charging, Emergency charging</td>
</tr>
<tr>
<td>II</td>
<td>240 V</td>
<td>2 – 4 hours</td>
<td>30-50 Typical</td>
<td>3-6</td>
<td>Residential garages, parking lots, public garages, transit centers</td>
</tr>
<tr>
<td>III</td>
<td>480 V 3 phase</td>
<td>20 – 40 minutes</td>
<td></td>
<td>50-100</td>
<td>Rapid charging facility near high traffic volume arterials</td>
</tr>
</tbody>
</table>
Level 1 Charging Stations

• Standard 120V, 20 amps
• Upgradable to Level 2
• Currently deployed in:
  – Portland
  – Hillsboro
  – Lake Oswego
  – Lincoln City
  – Others
Charging Infrastructure Underway

- **The EV Project** funded by US DOE will install about 1,200 Level 2 Public Charging Stations in Oregon
- Also will deploy 23 “DC Fast-Charge” units in the project area
- Jointly developed “Deployment Guidelines” with ECOtality for installing EV Charging locations
  
  – > See Handout
Other Ongoing Efforts

• Adopted sign to keep internal combustion engine ("ICE") vehicles out of EV Charging spots

• Petitioned FHWA to use an alternative “wayfinding” sign

• State Electrical Code amended to fast-track permitting and inspection of EV charging stations
State EV Incentives

- 2009 Legislature enacted a state tax credit of $1,500 for plug-in vehicles purchases
- Together with federal incentive, PIVs would receive up to $9,000 credit
- Businesses eligible for 35% credit of the incremental cost of EVs over conventional vehicles
- Also credits for charging devices (for businesses and individuals)
“Green Highway” Initiative

• Signed by Governors of Oregon, Washington and California and the Premier of British Columbia

• Executed in Vancouver, B.C. February 12, 2010
“Green Highway” Initiative

• Envisions being able to drive an EV from “BC to Baja”
• Network of 3-phase, 480V “fast chargers” at minimum intervals
• ODOT received $700,000 to in September to extend fast-charge network from Eugene to Ashland
• An additional $2 million in TIGER funds received in October to expand the network
Thanks for your attention!

More information available at:

http://www.oregon.gov/ODOT/HWY/OIPP/inn_ev-charging.shtml