Planning for Electric Vehicle Infrastructure

ELECTRIC VEHICLES

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EVs: Planning + Permitting Issues

- *Markets* for charging
- *Allowing* EV infrastructure
- *Permit / Inspection Processes*
- *Parking + Streetscape*
- *Handicap*
- *Payment*
- *Education*
- *Partners*
- *Resources*

96-99 EV1 / Cadillac ELR (2013)

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Markets for Charging

Primary	*Secondary*	*Tertiary*
• **Home**	• **Workplace**	• **Other public**

▶ **Remember: No one will buy an EV if they can't charge at home.**

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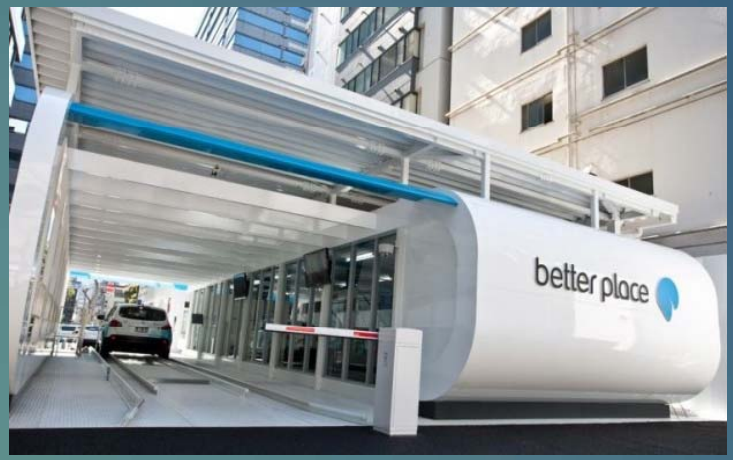
Allowing Charging Infrastructure

Actions to take

- Level 1 & 2
  - Incidental/Accessory use
- DC Fast Charge
  - Commercial or Industrial zones or Conditional Use
- EV Definitions in code
- Battery swapping stations
  - Principal use



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Allowing Charging Infrastructure

Questions to ask yourself

- Comp Plan?
- Incentives?
- Require EV stations?
  - Residential & Commercial

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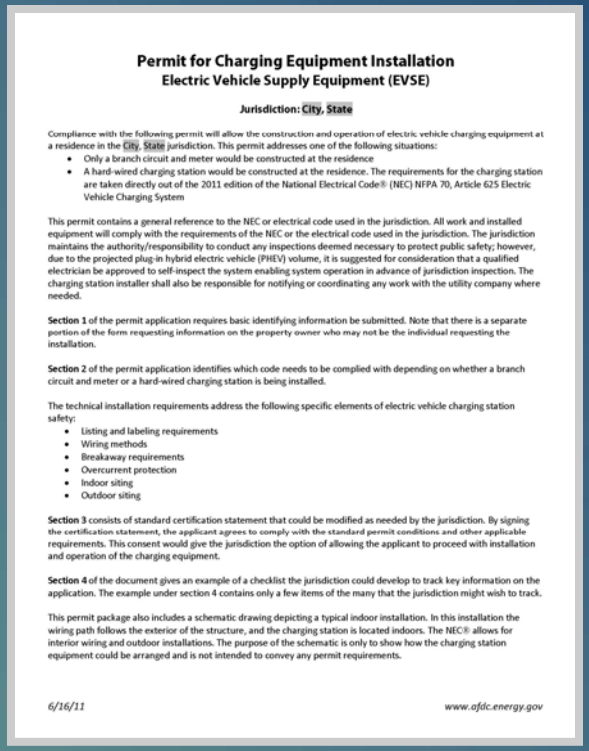
Permit/Inspection Process

Actions to take

- ►Permitting process needs to be **quick**
- ►Establish online permit
- ►Guarantee 24-48 hour EV permit or an instant permit
- ►Minor Label Program – Oregon
- ►Conditional Permit & Inspect Later



Permit for Charging Equipment Installation
Electric Vehicle Supply Equipment (EVSE)

Jurisdiction: City, State

Compliance with the following permit will allow the construction and operation of electric vehicle charging equipment at a residence in the City, State jurisdiction. This permit addresses one of the following situations:

- Only a branch circuit and meter would be constructed at the residence
- A hard-wired charging station would be constructed at the residence. The requirements for the charging station are taken directly out of the 2011 edition of the National Electrical Code® (NEC) NFPA 70, Article 625 Electric Vehicle Charging System

This permit contains a general reference to the NEC or electrical code used in the jurisdiction. All work and installed equipment will comply with the requirements of the NEC or the electrical code used in the jurisdiction. The jurisdiction maintains the authority/responsibility to conduct any inspections deemed necessary to protect public safety; however, due to the projected plug-in hybrid electric vehicle (PHEV) volume, it is suggested for consideration that a qualified electrician be approved to self-inspect the system enabling system operation in advance of jurisdiction inspection. The charging station installer shall also be responsible for notifying or coordinating any work with the utility company where needed.

Section 1 of the permit application requires basic identifying information be submitted. Note that there is a separate portion of the form requesting information on the property owner who may not be the individual requesting the installation.

Section 2 of the permit application identifies which code needs to be complied with depending on whether a branch circuit and meter or a hard-wired charging station is being installed.

The technical installation requirements address the following specific elements of electric vehicle charging station safety:

- Listing and labeling requirements
- Wiring methods
- Breakaway requirements
- Overcurrent protection
- Indoor siting
- Outdoor siting

Section 3 consists of standard certification statement that could be modified as needed by the jurisdiction. By signing the certification statement, the applicant agrees to comply with the standard permit conditions and other applicable requirements. This consent would give the jurisdiction the option of allowing the applicant to proceed with installation and operation of the charging equipment.

Section 4 of the document gives an example of a checklist the jurisdiction could develop to track key information on the application. The example under section 4 contains only a few items of the many that the jurisdiction might wish to track.

This permit package also includes a schematic drawing depicting a typical indoor installation. In this installation the wiring path follows the exterior of the structure, and the charging station is located indoors. The NEC® allows for interior wiring and outdoor installations. The purpose of the schematic is only to show how the charging station equipment could be arranged and is not intended to convey any permit requirements.

6/16/11 *www.afdc.energy.gov*

USDOE - National Model EV Permit

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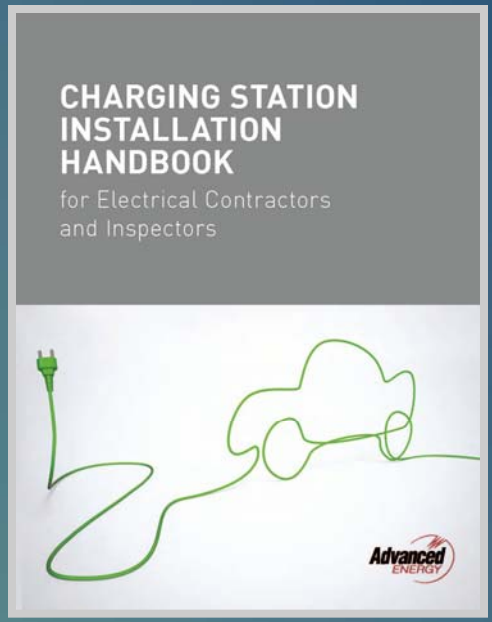
Permit/Inspection Process

Actions to take

- Educate car dealers so consumers have realistic expectations
- Provide inspectors with the EV inspectors guidebook
- Make sure utility is involved as part of process



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Parking + Streetscape

Actions to take

- Streetscape design standards
- Historic Districts
- Shared parking
- On and Off street parking design guidance & signage
- Colored pavements – *do <u>not</u>* use blue

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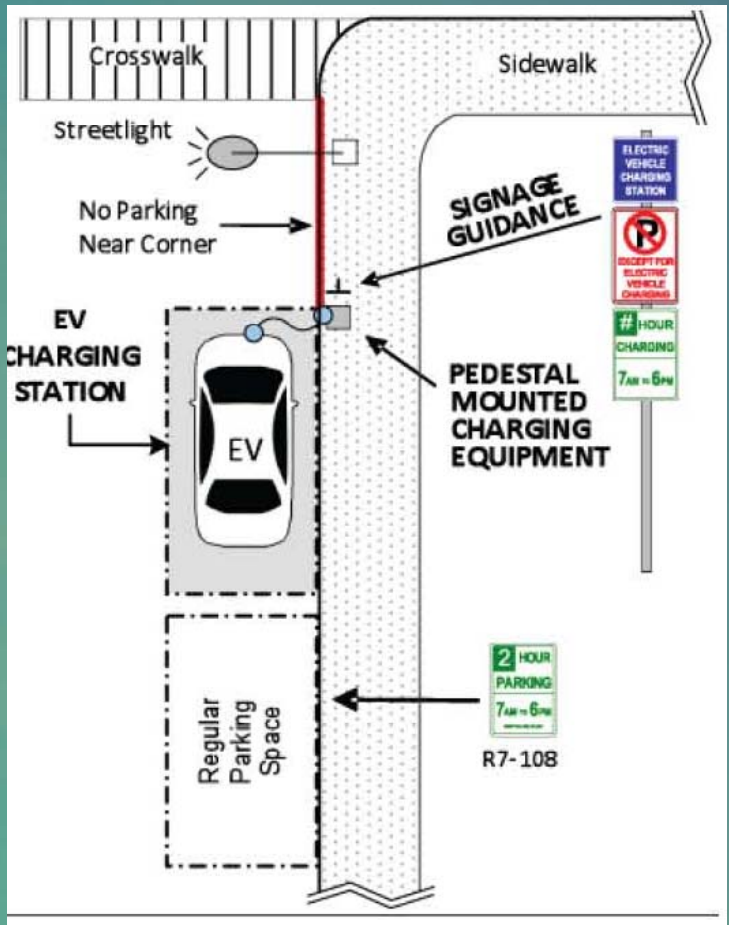
Parking + Streetscape



Questions to ask yourself

- Require retractable cords?
- Our definition of charging?
- Neighborhoods with no off-street parking?
- Utility requirements-coordination?
- Ownership and payment models?

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Public Parking Issues

- Parking = re-fueling opportunity
  - EV parking for *active charging*
  - Enforce normal time limits during day
  - Allow overnight for those without off-street EV charging
  - Define charging: WA defines as "connected"

Public Parking Issues

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"ICEd"

12" X 18"

12" X 18"

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Public Charging

- Pole mounted, wall mounted, pedestal style
- Integrated “revenue grade” utility meter
- Smart grid equipped
- Retractable enclosed cable system (GE)
- Level 1 - for electric scooters/bikes and NEVs
- Data collection - software
- Advance Reservations
- Some vendors provide charging station management, payment processing, maintenance, etc

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Payment

- Charging for electricity = UTILITY
- How avoid? Can charge for *time* or *connection* or *parking*
- Credit card swipes, phone number or membership card

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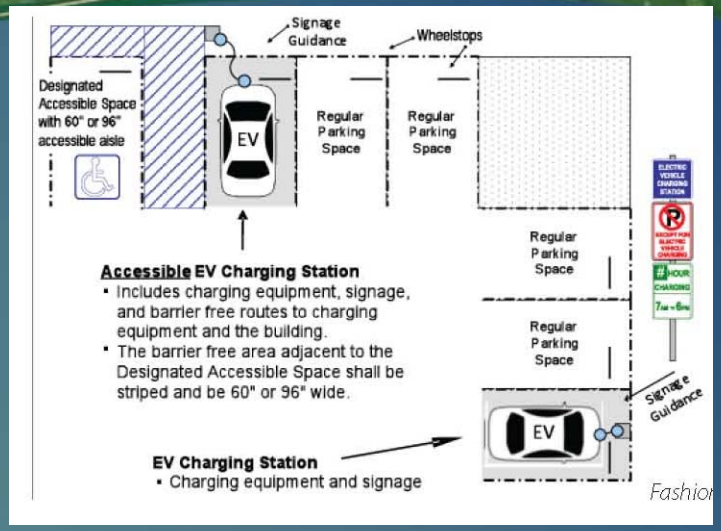
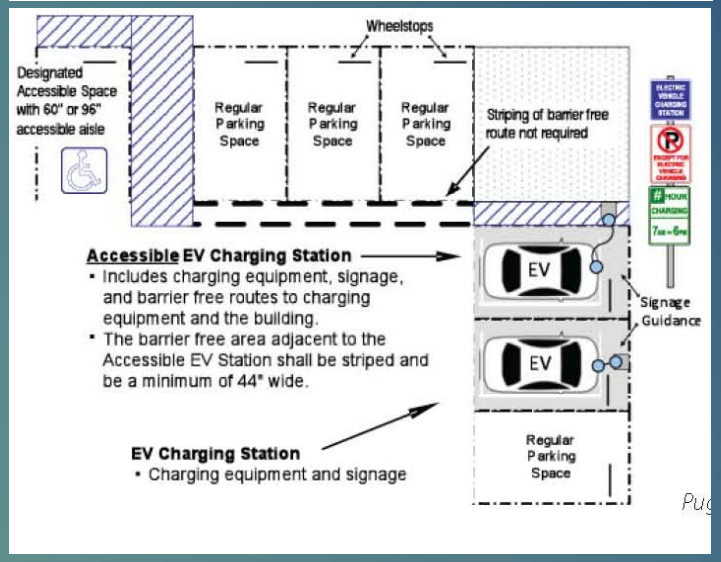
Handicap Issues

- No ADA requirements at this time
- Placement should not violate ADA pathways for sidewalk width etc.
- Recommendation: 1 handicap EV space per 25 EV spaces
- Cable must not run across ADA pathway





2011 FL/APA

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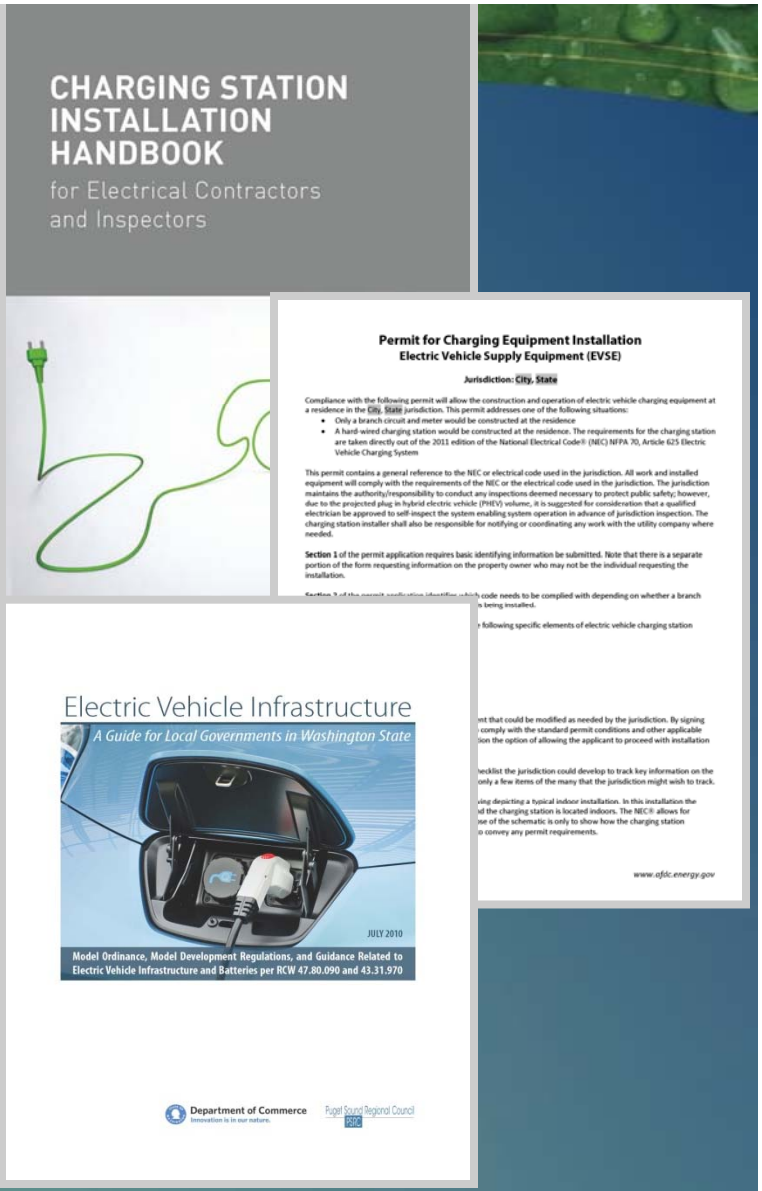
Resources

- Washington State Department of Commerce: Model ordinance, development regulations and guidance
- Charging Station Handbook for Electrical Inspectors and Contractors: Advanced Energy/City of Raleigh
- US DOE: Charging Station Permit Template: **Alt Fuels & Advanced Vehicles Data Center**
- VHB!
  - **Kim Lundgren**
  - **klundgren@vhb.com**
  - **617.924.1770**



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Partners

- Utilities
- Car Dealerships
- DMV
- Clean Cities
- MPO
- Hotels
- Large Employers
- Car Sharing (Zipcar/ Hertz On Demand)

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Education

- Emergency responders
  - NFPA training program
- Car Dealerships
- Parking garage owners
- Condo associations
- Electrical inspectors
- Utility mailings to homeowners
- Municipal Websites
- Community College training programs