Code Amendment Proposal Application

Proposal 7

Department of Consumer & Business Services
Building Codes Division
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Read the entire code amendment proposal application before completing this form. Please complete all parts before submitting your proposal and refer to the provided checklist.

APPLICANT INFORMATION

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Representing (if applicable): New Buildings Institute		Work phone: 503-761-7339
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PROPOSAL INFORMATION

Specialty code: Oregon Reach Code

Code section(s): 3.2; 10.4

Briefly explain the subject of your proposal: electric vehicle charging

INSTRUCTIONS AND CHECKLIST

Fill in all the information above and submit this page, signed and dated, with the required supplementary information for Parts I, II, and III listed in the following checklist. This application may be submitted by mail to the mailing address above, or by email to BCD.PTSPtech@oregon.gov.

Checklist:

- ■ **Part I** Code amendment language is attached in the proper format.
- ■ **Part II** Amendment proposal requirements for amending the code have been reviewed.
- ■ **Part III** Amendment proposal criteria questions have been answered and are attached.

Note: One application is required for each code section you are proposing to amend. If this proposal requires changes in other sections of the code for alignment, include those changes as part of this application.

APPLICANT SIGNATURE

Signature: Ben Rabe Date: 2/24/2022

Oregon Reach Code Proposal: Electrical Vehicle Charging

Part I: Code Amendment Language

Modify Section 3.2: Definitions as follows:

demand responsive control: An automatic control device that can receive and automatically respond to demand response requests from a utility, electrical system operator, or third-party demand response program provider.

electric vehicle (EV): An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Plug-in hybrid electric vehicles are electric vehicles having a second source of motive power. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not considered electric vehicles.

electric vehicle supply equipment (EVSE): The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically

EV-capable space: An automotive parking space that is reserved for the future installation of an EVSE.
EV-ready space: An automotive parking space that is provided with an electrical circuit capable of supporting an installed EVSE.
EVSE space: An automotive parking space that is provided with a dedicated EVSE.

Add new text as follows:

10.4.8 Electric Vehicle Charging Infrastructure

Parking facilities shall be provided with electric vehicle charging infrastructure in accordance with this section and Table 10.4.8 based on the total number of parking spaces and rounded up to the nearest whole number. EVSE, EV ready spaces and EV capable spaces may be counted toward meeting minimum parking requirements. EVSE spaces may be used to meet requirements for EV ready spaces and EV capable spaces. EV ready spaces may be used to meet requirements for EV capable spaces. Where more than one parking facility is provided on a building site, the number of parking spaces required shall be calculated separately for each parking facility. EV spaces shall be uniformly distributed in the parking facility.

Exception to 10.4.8

In parking garages, the conduit required for *EV capable spaces* may be omitted provided the parking garage electrical service has no less than 1.8 kVA of additional reserved capacity per *EV capable space.*

Table 10.4.8 Electric Vehicle Charging Infrastructure Requirements

Occupancy	*EVSE Spaces*	*EV Ready Spaces*	*EV Capable Spaces*
Group B Occupancies	15%	NA	40%
Group M Occupancies	25%	NA	40%
R-2 Occupancy	NA	100%[a]	NA
All other Occupancies	10%	NA	40%

a. Or one *EV ready space* per *dwelling unit.*

10.4.8.1 EV Capable Spaces. *EV Capable Spaces* shall be provided with electrical infrastructure that meets the following requirements:

1. Conduit that is continuous between a junction box or outlet located within 3 feet (914 mm) of the parking space and an electrical panel serving the area of the parking space.
2. The electrical panel to which the conduit connects shall have sufficient dedicated physical space for a dedicated dual-pole, 40-amp breaker.
3. The conduit shall be sized and rated to accommodate a 40-amp, 208/240-volt branch circuit and have a minimum nominal trade size of 1 inch.
4. The electrical junction box and the electrical panel directory entry for the dedicated space in the electrical panel shall have labels stating "For future *electric vehicle* charging".

10.4.8.2 EV Ready Spaces. The branch circuit serving *EV Ready Spaces* shall meet the following requirements:

1. Wiring capable of supporting a 40-amp, 208/240-volt circuit.
2. Terminates at an outlet or junction box located within 3 feet (914 mm) of the parking space.
4. A minimum capacity of 1.8 kVA.
5. The electrical panel directory shall designate the branch circuit as "For electric vehicle charging" and the junction box or receptacle shall be labelled "For electric vehicle charging."

10.4.8.3 EVSE Spaces. The *EVSE* serving *EVSE spaces* shall meet the following requirements:

1. Capable of supplying not less than 6.2 kW to an electric vehicle.

   Exception: An ALMS may be used to reduce the total electrical capacity required by EVSE spaces provided that all EVSE spaces are capable of simultaneously charging at a minimum rate of 1.4 kW.

2. Located within 3 feet (914 mm) of the *EVSE space*.

10.4.9 Electric infrastructure for energy storage

Each building site shall have space for on-site energy storage not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in

accordance with Section 1206.2.8 of the International Fire Code and Section110.26 of the NFPA 70.

Exception to 10.4.9

Where an onsite electrical energy system storage system is installed.

10.4.9.1 Electrical service reserved space

The main electrical service panel shall have a reserved space to allow installation of a two-pole circuit breaker for future electrical energy storage system installation This space shall be labeled "For Future Electric Storage." The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

Part II –Code Amendment Proposal Requirements

To the best of our knowledge, this proposal aligns with all statutes and rules governing the Oregon state building code.

Part III -Code Amendment Proposal Criteria

Preparing our buildings for safe and convenient EV charging infrastructure is critical to deployment of electric vehicles. The transportation sector is the single largest source of GHG emissions in the nation. Near complete electrification of the transportation sector is necessary to achieve the GHG emission reductions needed to avoid the worst effects of climate change.

Electric vehicle sales increased by 80 percent from 2017 to 2018, and is expected to grow from 1 million vehicles at the end of 2018 to 18.7 million by 2030. As newer EVs with longer drive ranges enter the market, the older, shorter drive range EVs will move to the used vehicle market, and become readily accessible to a secondary market for which the accessibility of EV charging infrastructure at home and at work will be critical.

Inclusion in the IECC of EV Infrastructure requirements is critical in the prevention of the use of extension cords to inappropriate outlets for the purpose of vehicle charging. We must be building structures that will address the vehicles that the major automakers have already shown us they are producing, especially as they close out the production of ICE vehicles and switch to total EV manufacturing.

Buildings built in 2022 should last 50 years. By 2045 Ernst & Young predicts internal combustion engine (ICE) vehicles will make up less than 1% of new car sales globally. Bloomberg reports that the automakers' capital expenditures on capital equipment for electric vehicle manufacturing is important because it is the culmination of a manufacturer's multi-year exploration of the future; "Capex is Destiny." *

Shouldn't we be building structures to accommodate the vehicles that the automakers are telling us they are switching to? Shouldn't we be installing the infrastructure when it is least expensive to install? Shouldn't we be addressing the single largest source of GHG emissions?

The code change proposal will increase the cost of construction.

Recent analysis by NBI and partners using cost data from RSMeans and the PNNL medium office prototype found that the average total cost of an EVSE space in a commercial parking lot was $4702: $1558 in materials and $3145 in labor. These costs include a dual-head commercial Clipper Creek EVSE mounted on a commercial pedestal, raceways, and all electrical conductors. If the electrical panel and onsite transformer have to be upsized – something that will only happen on some projects – there would be an additional cost of $1200 per space.

Using the same prototype and data sources, each EV capable space required an additional cost of $123 per space for conduit (assuming an average 100' run) and junction boxes if no capacity upgrade is required. If the panel and onsite transformer have to upsized to accommodate design loads, then that cost could increase by $1200 per space.

However, with the future demand for EVs and EV charging discussed in the reason statement, commercial parking facilities that do not include EV spaces during new construction will face substantially higher costs to retrofit those spaces in the future. For example, a cost-effectiveness study for the City and County of San Francisco conducted by Pacific Gas & Electric (PG&E) showed that the cost of an EV Ready space (full circuit for level 2 charging) installed during new construction was $860-$920, while a retrofit would cost $2370-$3710,[1] 3-4 times the cost. An analysis conducted by the California Air Resource Board found much higher cost savings of $7000 from avoided retrofit costs when EV spaces are installed during construction rather than retrofit, with the majority of the cost delta due to the cost of retrenching parking lots and doing costly panel and transformer upgrades.[2] The EV Capable spaces required by this proposal avoid nearly all of these incremental retrofit costs by including the most difficult elements to retrofit (trenching and panels) during new construction.

These EV chargers will also yield substantial economic benefits for both the individual that owns the EV and the building owner. For individuals, EVs cost much less to fuel and maintain than gas-powered vehicles. According to AAA, an electric vehicle (EV) will save roughly $1,039 per year in total fuel and maintenance costs compared to a comparable gasoline vehicle. Although Electric Vehicles are often more expensive than gasoline powered vehicles, Bloomberg New Energy Finance on battery costs suggests EVs could reach upfront cost parity with gasoline vehicles by the early-to-mid 2020s. For building owners, installing EV chargers will increase property values, attract new customers or tenants and improve staff and tenant retention.

With the growing market demand for EVs and the growing demand for charging they create, it not a question of if EV spaces will be needed, but when. Building owners and tenants will be paying for this cost now or in the future. Failing to install a minimal number of EVSE spaces and EV capable spaces now will saddle building owners and tenants with substantially higher costs due to costly future retrofits.