March 11, 2022

Washington State Building Code Council
1500 Jefferson Avenue S.E.
P.O. Box 41449
Olympia, Washington 98504-1449

Provided via email to sbcc@des.wa.gov

Dear Chair Klein and Members of the Washington State Building Code Council,

The undersigned organizations appreciate the opportunity to comment on the Electric Vehicle Charging Infrastructure proposal included in the International Building Code CR-102 from the 2021 Code Adoption Cycle. With the passage of HB 1287 (2021), the State Building Code Council (SBCC) was directed to adopt rules that:

- Exceed the specific minimum electric vehicle (EV) infrastructure requirements established in RCW 19.27.540(2) for all residential and commercial buildings;
- Ensure the requirements support the anticipated levels of zero emission vehicle use; and
- Anticipate zero emission vehicle use based on vehicle adoption resulting from the zero emissions vehicle program requirements in chapter 70A.30 RCW and that result in emissions reductions consistent with RCW 70A.45.020.

On January 18, 2022, Washington Department of Ecology opened a rulemaking to adopt California's updated Advanced Clean Cars II (ACC II).[1] Ecology plans to adopt this by the end of this calendar year. As currently proposed, ACC II will require 35 percent of new passenger vehicles in 2026 to be electric, 51 percent in 2028, and 100 percent by 2035. This level of electrification requires robust EV charging infrastructure.

While HB 1287 requires SBCC to adopt rules by July 1, 2024, and periodically update them thereafter, we are encouraged by the SBCC's work to adopt initial requirements now. This will allow the EV infrastructure requirements to phase in over time to support the growing number of EVs in Washington and reduce costs for residents.

EV infrastructure building codes result in significantly lower costs than retrofits. Avista reported that the average retrofit cost for level 2 electric vehicle supply equipment at commercial buildings was $8,332 but costs were lower for simpler installations that avoided service upgrades and trench work – meaning changes to new building codes could lower lifecycle costs.[2] One study analyzing the cost implications of California's EV infrastructure building codes found that each EV-Capable parking space installed in a multi-unit dwelling during new

[1] https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC173-423-400Jan18
[2] Docket UE-160082, Final Report on Electric Vehicle Supply Equipment Pilot Program, Avista Corporation, October 2019 https://www.utc.wa.gov/casedocket/2016/160082/docsets

construction saves $2,040 - $4,635 over the retrofit scenario.[3] The EV Charging Infrastructure proposal (EV proposal) will provide significant cost savings to Washington residents.

The EV proposal outlined in Section 429 provides a strong foundation and we offer the following comments to address recommended revisions to the EV proposal found in Attachments 1 and 2.

Definitions

The EV proposal definitions should be revised to align with the National Electric Code and the latest industry standards in development,[4] including building off of existing policy in Washington State, such as Seattle's electric vehicle charging infrastructure ordinance[5] and Issaquah's.[6] In Attachments 1 and 2, we recommend several technical changes to definitions. These changes include:

- Expanding the definitions of "EV capable parking space", "EV ready parking space", and "EVSE" to include necessary and appropriate equipment;
- Adding the definition of "EV supply equipment parking space", to clarify requirements tied to the parking space, not the equipment;
- Adding the definition for "Automated Load Management System", to enable the optional ability for load management across EV supply equipment; and
- Removing the definitions and reference to the terms "EV charger" and "EV charging station" as duplicative and unnecessary given the definitions of "EV supply equipment" and "EV supply equipment space".

Section 429.2 Exceptions

Providing exceptions for on-site parking with less than 10 parking spaces and alternative requirements 2.1 and 2.2 for Group A, Group E, and Group M appear to be overly broad and without further analysis, could presumably exempt a significant amount of parking spaces that are necessary to support the transition to EVs. Specifically, Group M, which includes mercantile occupancies such as department stores, markets, and drug stores, should not have electric vehicle charging infrastructure requirements in Table 429.2 apply only to designated employee parking. These locations are commonly where public EVSE is found today for *both* employees and visitors. We would be interested in learning the reasons for and the potential impacts of these broad exceptions through additional analysis. Without compelling information as to why these exemptions are necessary, we recommend their removal.

Table 429.2 Electric Vehicle Charging Infrastructure

We support the recommended EVSE parking spaces, EV-ready parking spaces, and EV-capable parking spaces required for non-residential occupancy types.

For all other Group R occupancies, specifically for R-2, which includes multi-unit dwellings (MUD), we strongly recommend increasing the requirement for EV-capable parking spaces to 25% and maintaining the proposed requirements for EV-ready parking spaces and EVSE parking spaces. MUD occupants often face significant obstacles to cost effectively retrofit their

[3] https://caletc.aodesignsolutions.com/assets/files/CALGreen-2019-Supplement-Cost-Analysis-Final-1.pdf
[4] https://drive.google.com/file/d/193rEQ2K3-6ZXUf4hL6sp9NB8_6tX1W9M/view?usp=sharing
[5]http://seattle.legistar.com/LegislationDetail.aspx?ID=3875336&GUID=A89842CC-3B4A-4C3E-B72B-D5647FED37DB&FullText=1
[6] https://mrsc.org/getmedia/804f4355-5fe2-4760-9da1-b08db89091f7/i75o2941.pdf.aspx

buildings. For those living in MUDs, the additional cost to upgrade the electrical panel, install conduit between the electrical panel and their parking space, and the logistical challenges of securing building owner approval, coordinating the billing with the building owner, and persuading an owner to make a long-term investment on a rental property, make EVSE installation cost prohibitive for many. The lack of access to home charging for those living in MUDs is a critical barrier to widespread EV adoption. Given that new MUDs will last for 50-100 years, it is critical to expand the minimum requirements for EV-capable parking spaces from 10% to 25% to ensure future MUD residents have fewer obstacles and costs to bear to access EV charging at home.

Additionally, it is unclear whether the EVSE parking requirements outlined in Table 429.2 are additive or if only the requirements of one category must be met.[7] To provide clarity, we recommend explicitly stating that the requirements for each category must be met and how exceeding minimum requirements can be counted for other minimum requirements. The revisions in Attachments 1 and 2 include additional clarification.

Minimum Capacity Requirements

A minimum circuit capacity of no less than 8.3 kVA (or 40 amperes at 208/240 volts) is the standard minimum requirement to serve EVSE. With use of Automatic Load Management Systems (ALMS), the electrical capacity required for EV-ready and EV-capable parking spaces may be adjusted to allocate to multiple EVSE parking spaces.[8] Importantly, ALMS must be optional, and it must be designed to allocate charging capacity among multiple EVSE parking spaces at no less than 4.1 kVA (20 amperes at 208/240 volts) for each EV capable space to ensure that there is adequate minimum reserve capacity to sufficiently serve EV charging needs.

Conclusion

Thank you again for including the EV proposal in the 2021 Code Adoption Cycle. We urge you to incorporate the suggestions listed above so Washington State Code uses language consistent with other jurisdictions and so it adheres to the legislative direction to set requirements that will support our State's policies and goals for electrifying our transportation system. It is critical that code language establishes sound policy that will future-proof buildings and residences and supports State statute and goals.

Sincerely,

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[7] The categories listed in Table 429.2 are Number of EV Charging Stations, Number of EV-Ready Parking Spaces, and Number of EV-Capable Parking Spaces.
[8] RCW 19.27.540(2)(a)

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Attachment 1: Redline Proposed Revisions to CR-102 (December 2017) (Implements RCW 34.05.320)

ELECTRIC VEHICLE (EV) CAPABLE PARKING SPACE. A parking space provided with electrical infrastructure, such as, but not limited to, raceways, cables, electrical capacity, and panelboard or other electrical distribution equipment space, necessary for ~~a conduit, electrical panel and load capacity to support~~ future installation of EV charging equipment.

~~**ELECTRIC VEHICLE (EV) CHARGER.** Off-board charging equipment used to charge electric vehicles.~~

~~**ELECTRIC VEHICLE (EV) CHARGING STATION.** EV Ready parking space with installed EV charger.~~

ELECTRIC VEHICLE (EV) READY PARKING SPACE. A parking space provided with a branch circuit and either an outlet or receptacle, that will support installed EV charging equipment ~~a receptacle outlet allowing charging of electric vehicles~~.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). Equipment for plug-in charging including the ungrounded, grounded and equipment grounding conductors, and the electric vehicle connectors, attachment plugs, personal protection system and all other fittings, devices, power outlets or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle. ~~The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the electric vehicle connectors, attachment plugs, personnel protection system, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.~~

ELECTRIC VEHICLE SUPPLY EQUIPMENT PARKING SPACE. A parking space provided with a dedicated EVSE connection.

AUTOMATIC LOAD MANAGEMENT SYSTEM (ALMS). A system designed to manage load across one or more electric vehicle supply equipment (EVSE) to share electrical capacity and/or automatically manage power at each connection point.

WAC 51-50-0429 Section 429—Electric vehicle charging infrastructure.

429.1 General. The provisions of this section shall apply to the construction of new buildings and accessory structures, including parking lots and parking garages.

Electric vehicle supply equipment (EVSE) shall be installed in accordance with applicable requirements of chapter 19.28 RCW and the National Electrical Code, Article 625.

EXCEPTION: Electric vehicle charging infrastructure is not required if any of the following conditions are met:

1. There is no public utility or commercial power supply.

2. Dwelling units without garages or other on-site parking.

429.2 Electric vehicle (EV) charging infrastructure. Buildings and accessory structures shall be provided with ~~EV charging stations~~EVSE parking spaces, EV-~~R~~ready parking spaces, and EV-capable parking spaces in accordance with Table 429.2. Calculations shall be rounded up to the nearest whole number. EVSE parking spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for EV-ready parking spaces or EV-capable parking spaces. EV-ready parking spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for EV-capable parking spaces. EVSE parking spaces, EV-ready parking spaces, and EV-capable parking space shall be counted toward meeting minimum parking requirements. Where a building contains more than one occupancy, the electric vehicle charging infrastructure percentages of Table 429.2 shall be applied to the number of spaces required for each occupancy.

EXCEPTIONS:

~~1. Except for Group A, Group E, and Group M occupancies, on-site parking with less than 10 parking spaces shall not be required to comply with Section 429.2.~~

1~~2~~. Group A and~~,~~ Group E~~, and Group M~~ occupancies shall comply with one of the following, whichever is greater:

1~~2~~.1. The provisions of Section 429.2 shall apply only to designated employee parking spaces.

1~~2~~.2. One of each 200 parking spaces or fraction thereof shall be EV-~~R~~ready parking spaces. One of each 200 parking spaces or fraction thereof shall be an ~~EV Charging Station~~EVSE parking space.

Table 429.2 Electric Vehicle Charging Infrastructure

Occupancy	**Number of EVSE Parking Spaces ~~Charging Stations~~**	**Number of EV-~~R~~ready Parking Spaces**	**Number of EV-~~C~~capable Parking Spaces**
Group A, B, E, F, H, I, M, and S occupancies	10% of total parking spaces	10% of total parking spaces	10% of total parking spaces
Group R occupancies			
Buildings that do not contain more than two dwelling units	Not required	One for each dwelling unit	Not required
Dwelling units with private garages	Not required	One for each dwelling unit	Not required
All other Group R occupancies	10% of total parking spaces	25% of total parking spaces	25~~10~~% of total parking spaces

429.2.1 EVSE parking spaces~~charging stations and EV-Ready parking spaces~~. ~~A minimum of 40-ampere dedicated 208/240-volt branch circuit shall be installed for each EV Ready parking space and each EV Charging Station. The branch circuits shall terminate at a receptacle outlet or EV charger in close proximity to the proposed location of the EV Ready parking space or the EV Charging Station.~~ An installed EVSE with multiple output connections shall be permitted to

serve multiple EVSE parking spaces. Each EVSE installed serving either a single EVSE space or multiple EVSE spaces shall comply with all of the following:

1. Have a minimum circuit capacity not less than 8.3 kVA (or 40A at 208/240V) for each EVSE parking space.
2. Be capable of charging at a minimum rate of 6.2 kVA (or 30A at 208/240V).
3. Be located within 3 feet (914 mm) of each EVSE parking space it serves.

429.2.2 EV-Ready parking spaces. Each branch circuit serving EV-R**eady** parking spaces used to meet the requirements of Section 429.2 shall comply with all of the following:

1. Terminate at an outlet, located within 3 feet (914 mm) of each EV-ready parking space it serves.
2. Have a minimum circuit capacity shall have a rated capacity not less than 8.3 kVA (or 40A at 208/240V) for each EV-ready parking space.
3. The panelboard or other electrical distribution equipment directory shall designate the branch circuit as "For electric vehicle supply equipment (EVSE)" and the outlet or enclosure shall be marked "For electric vehicle supply equipment (EVSE)."

429.2.3~~2~~ EV-Capable parking spaces. ~~A listed raceway capable of accommodating a minimum of 40-ampere dedicated 208/240-volt branch circuit shall be installed for each EV Capable parking space. The raceway shall terminate into a cabinet, box or other enclosure in close proximity to the proposed location of the EV Capable parking space. Raceways and related components that are planned to be installed underground, and in enclosed, inaccessible or concealed areas and spaces, shall be installed at the time of original construction.~~ Each EV capable parking space used to meet the requirements of Section 429.2 shall comply with all of the following:

1. A continuous raceway or cable assembly shall be installed between an enclosure or outlet located within 3 feet (914 mm) of the EV capable space and a suitable panelboard or other onsite electrical distribution equipment.
2. Installed raceway or cable assembly shall be sized and rated to supply a minimum circuit capacity not less than 8.3 kVA (or 40A at 208/240V) for each EV-ready parking space.
3. The electrical distribution equipment to which the raceway or cable assembly connects shall have sufficient dedicated space and spare electrical capacity for a 2-pole circuit breaker or set of fuses.
4. The electrical enclosure or outlet and the electrical distribution equipment directory shall be marked: "For future electric vehicle supply equipment (EVSE)."
5. Reserved capacity shall be no less than 4.1 kVA (20A 208/240V) for each EV capable space.

429.3 Electrical room(s) and equipment. Electrical room(s) and/or dedicated electrical equipment shall be sized to accommodate the requirements of Section 429. The electrical service and the electrical system, including any on-site distribution transformer(s), shall have sufficient capacity to simultaneously charge all EVs at all required EVSE parking spaces~~Charging Stations~~, EV Ready parking spaces, and EV-Capable parking spaces ~~at a minimum of 40-amperes each~~to meet the requirements in section 429.2.

EXCEPTION: Automatic Load Management System (ALMS) may be used to adjust the maximum electrical capacity required for the EV-Rready and EV-Ccapable parking spaces. The ALMS must be designed to allocate charging capacity among multiple future EVSE parking spaces Charging Stations at no less than 4.1 kVA (20A 208/240V) for each EV capable parking space a minimum of 16 amperes per EV charger.

429.4 Electric vehicle charging infrastructure for accessible parking spaces. Ten percent of the accessible parking spaces, rounded to the next whole number, shall be EV Charging Stations. Additional ten percent of the accessible parking spaces, rounded to the next whole number, shall be EV Ready.

The electric vehicle charging infrastructure may also serve adjacent parking spaces not designated as accessible parking. A maximum of ten percent of the accessible parking spaces, rounded to the next whole number, are allowed to be included in the total number of electric vehicle parking spaces required under Section 429.23.

Attachment 2: Clean Proposed Revisions to CR-102 (December 2017) (Implements RCW 34.05.320)

ELECTRIC VEHICLE (EV) CAPABLE PARKING SPACE. A parking space provided with electrical infrastructure, such as, but not limited to, raceways, cables, electrical capacity, and panelboard or other electrical distribution equipment space, necessary for future installation of EV charging equipment.

ELECTRIC VEHICLE (EV) READY PARKING SPACE. A parking space provided with a branch circuit and either an outlet or receptacle, that will support installed EV charging equipment.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). Equipment for plug-in charging including the ungrounded, grounded and equipment grounding conductors, and the electric vehicle connectors, attachment plugs, personal protection system and all other fittings, devices, power outlets or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

ELECTRIC VEHICLE SUPPLY EQUIPMENT PARKING SPACE. A parking space provided with a dedicated EVSE connection.

AUTOMATIC LOAD MANAGEMENT SYSTEM (ALMS). A system designed to manage load across one or more electric vehicle supply equipment (EVSE) to share electrical capacity and/or automatically manage power at each connection point.

WAC 51-50-0429 Section 429—Electric vehicle charging infrastructure.

429.1 General. The provisions of this section shall apply to the construction of new buildings and accessory structures, including parking lots and parking garages.

Electric vehicle supply equipment (EVSE) shall be installed in accordance with applicable requirements of chapter 19.28 RCW and the National Electrical Code, Article 625.

EXCEPTION: Electric vehicle charging infrastructure is not required if any of the following conditions are met:

1. There is no public utility or commercial power supply.
2. Dwelling units without garages or other on-site parking.

429.2 Electric vehicle (EV) charging infrastructure. Buildings and accessory structures shall be provided with EVSE parking spaces, EV-ready parking spaces, and EV-capable parking spaces in accordance with Table 429.2. Calculations shall be rounded up to the nearest whole number. EVSE parking spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for EV-ready parking spaces or EV-capable parking spaces. EV-ready parking spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for EV-capable parking spaces. EVSE parking spaces, EV-ready parking spaces, and EV-capable parking spaces shall be counted toward meeting minimum parking requirements. Where a building contains more than one occupancy, the

electric vehicle charging infrastructure percentages of Table 429.2 shall be applied to the number of spaces required for each occupancy.

EXCEPTIONS:

1. Group A and Group E occupancies shall comply with one of the following, whichever is greater:

1.1. The provisions of Section 429.2 shall apply only to designated employee parking spaces.

1.2. One of each 200 parking spaces or fraction thereof shall be EV-ready parking spaces. One of each 200 parking spaces or fraction thereof shall be an EVSE parking space.

Table 429.2 Electric Vehicle Charging Infrastructure

Occupancy	**Number of EVSE Parking Spaces**	**Number of EV-ready Parking Spaces**	**Number of EV-capable Parking Spaces**
Group A, B, E, F, H, I, M, and S occupancies	10% of total parking spaces	10% of total parking spaces	10% of total parking spaces
Group R occupancies			
Buildings that do not contain more than two dwelling units	Not required	One for each dwelling unit	Not required
Dwelling units with private garages	Not required	One for each dwelling unit	Not required
All other Group R occupancies	10% of total parking spaces	25% of total parking spaces	25% of total parking spaces

429.2.1 EVSE parking spaces.

An installed EVSE with multiple output connections shall be permitted to serve multiple EVSE parking spaces. Each EVSE installed serving either a single EVSE space or multiple EVSE spaces shall comply with all of the following:

1. Have a minimum circuit capacity not less than 8.3 kVA (or 40A at 208/240V) for each EVSE parking space.
2. Be capable of charging at a minimum rate of 6.2 kVA (or 30A at 208/240V).
3. Be located within 3 feet (914 mm) of each EVSE parking space it serves.

429.2.2 EV-Ready parking spaces. Each branch circuit serving EV-Ready parking spaces used to meet the requirements of Section 429.2 shall comply with all of the following:

1. Terminate at an outlet, located within 3 feet (914 mm) of each EV-ready parking space it serves.

2. Have a minimum circuit capacity shall have a rated capacity not less than 8.3 kVA (or 40A at 208/240V) for each EV-ready parking space.
3. The panelboard or other electrical distribution equipment directory shall designate the branch circuit as “For electric vehicle supply equipment (EVSE)” and the outlet or enclosure shall be marked “For electric vehicle supply equipment (EVSE).”

429.2.3 EV-Capable parking spaces. Each EV capable parking space used to meet the requirements of Section 429.2 shall comply with all of the following:

1. A continuous raceway or cable assembly shall be installed between an enclosure or outlet located within 3 feet (914 mm) of the EV capable space and a suitable panelboard or other onsite electrical distribution equipment.
2. Installed raceway or cable assembly shall be sized and rated to supply a minimum circuit capacity not less than 8.3 kVA (or 40A at 208/240V) for each EV-ready parking space.
3. The electrical distribution equipment to which the raceway or cable assembly connects shall have sufficient dedicated space and spare electrical capacity for a 2-pole circuit breaker or set of fuses.
4. The electrical enclosure or outlet and the electrical distribution equipment directory shall be marked: “For future electric vehicle supply equipment (EVSE).”
5. Reserved capacity shall be no less than 4.1 kVA (20A 208/240V) for each EV capable space.

429.3 Electrical room(s) and equipment. Electrical room(s) and/or dedicated electrical equipment shall be sized to accommodate the requirements of Section 429. The electrical service and the electrical system, including any on-site distribution transformer(s), shall have sufficient capacity to simultaneously charge all EVs at all required EVSE parking spaces, EV Ready parking spaces, and EV-Capable parking spaces to meet the requirements in section 429.2.

EXCEPTION: Automatic Load Management System (ALMS) may be used to adjust the maximum electrical capacity required for the EV-ready and EV-capable parking spaces. The ALMS must be designed to allocate charging capacity among multiple future EVSE parking spaces at no less than 4.1 kVA (20A 208/240V) for each EV capable parking space.

429.4 Electric vehicle charging infrastructure for accessible parking spaces. Ten percent of the accessible parking spaces, rounded to the next whole number, shall be EV Charging Stations. Additional ten percent of the accessible parking spaces, rounded to the next whole number, shall be EV Ready.

The electric vehicle charging infrastructure may also serve adjacent parking spaces not designated as accessible parking. A maximum of ten percent of the accessible parking spaces, rounded to the next whole number, are allowed to be included in the total number of parking spaces required under Section 429.2.