

Multiplex Housing EV Charging Infrastructure Code Requirement Recommendation

Reference:

[RCW 19.27.540: Electric vehicle infrastructure requirements—Rules.](#)

BFRW 2024 EV Charging Code Change for 2024 WSBC: [IBC EV Sections BFRW R3.pdf](#)

IRC TAG 2024 EV Charging Code Change for 2024 WSRC: [24-GP2-049-R1_24IRC317.pdf](#)

Summary Table:

Situation	Requirement
DUs w/attached private carports or garages.	WSRC R317.6.1 applies. One 40-amp, 208/240-volt branch circuit installed in panel and terminate at box, outlet, or EVSE.
Multiplex Housing w/shared parking.	Conduit for 50% of DUs. For high adoption scenario of NWPC Power Plan with 10% discount for cost savings. Minus EV ready spaces so total doesn't exceed 50% of DU. Minimum EV ready spaces based on 20% of DUs, outlet with wiring and panel service.
Multiplex w/no parking provided.	No requirement for EV charging infrastructure (implied).
Accessible parking	Separate requirements from main EV charging infrastructure and differing from WSBC which allows 10% of EV charging infrastructure serving accessible parking to count towards main requirements.

Code Language:

SECTION R202

DEFINITIONS

AUTOMOBILE PARKING SPACE. A space within a *building* or private or public parking lot, exclusive of driveways, ramps, columns, office and work areas, for the parking of an automobile.

ELECTRIC VEHICLE CAPABLE SPACE (EV CAPABLE SPACE). A designated *automobile parking space* that is provided with a *raceway* and electrical distribution equipment space *necessary for the future installation of an EVSE.*

ELECTRIC VEHICLE READY SPACE (EV READY SPACE). An *automobile parking space* that is provided with a branch circuit and an outlet, junction box, or receptacle that will support an installed *EVSE.*

RACEWAY. An enclosed channel of metal or nonmetallic materials designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this Code.

SECTION XX104

PARKING REQUIREMENTS

XX104.2 Electric vehicle charging infrastructure.

The provisions of this section shall apply to the construction of new *dwelling units* in new *multiplexes* per Section R101.2.

Where shared on-site parking is provided, *EV ready* and *EV capable* spaces shall be provided in accordance with Table XX104.2. (Option B: Calculations shall be rounded up to the nearest whole number.)

Electrical vehicle charging infrastructure shall be permitted to be designed and installed such that an *EVSE* or future *EVSE* can serve multiple adjacent spaces with multiple output connections.

Exception:

1. Where there is no public utility or commercial power supply.

Option A

Table XX104.2

Electrical Vehicle Charging Infrastructure

Number of Dwelling Units	Number of EV Ready Spaces	Number of EV Capable Spaces
3	1	1
4	1	1
5	1	2
6	2	1

Option B

Table XX104.2

Electrical Vehicle Charging Infrastructure

Number of EV Ready Spaces	Number of EV Capable Spaces
20% of <i>automobile parking spaces</i>	50% of <i>automobile parking spaces</i> , minus the number of <i>EV ready spaces</i>

XX104.2.1 EV ready spaces. A minimum of 40-ampere dedicated 208/240-volt branch circuit shall be installed for each *EV ready space*. The branch circuits shall terminate at a receptacle outlet or *EVSE* in close proximity to the proposed location of the *EV ready space*.

XX104.2.2 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 space*. A continuous *raceway* shall be installed between an enclosure, end cap, or outlet located within close proximity of the *EV capable space* and future or existing panelboard or switchboard location(s). *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.

XX104.3 Electrical room(s) and equipment.

Electrical room(s) or areas for dedicated electrical equipment shall be sized to accommodate the requirements of Section XX104.2.1 through XX104.2.2.

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 *EV ready spaces* at a minimum of 40-amperes each.

EXCEPTION: *Automatic Load Management System (ALMS)* may be used to adjust the maximum electrical capacity required for the *EVSE spaces* and *EV ready spaces*. The *ALMS* must be designed to allocate charging capacity among multiple future *EVSE* at a minimum of 16 amperes per *EVSE*.

XX104.4 Electric vehicle charging infrastructure for accessible parking spaces.

Where accessible parking spaces are required,

electric vehicle charging infrastructure shall be provided for accessible parking spaces in accordance with Table XX104.4. (Option A: The minimum amount of accessible spaces provided with electric vehicle charging infrastructure to meet the requirements of Table XX104.4 shall not count towards the requirements of Table XX104.2.) (Option B: Accessible spaces provided with electric vehicle charging infrastructure to meet the requirements of Table XX104.4 shall be permitted to count towards the requirements of Table XX104.2.)

Electrical vehicle charging infrastructure serving accessible parking spaces shall be permitted to be designed to serve adjacent *automobile parking spaces* that are not designated as accessible parking.

TABLE XX104.4 Electric vehicle charging infrastructure for accessible parking spaces.

Required Minimum Number of Accessible Spaces	Required level of electric vehicle charging infrastructure
1	<i>EV ready space</i>
2	<i>One EV ready space and one EV capable space</i>

V2 Update:

Based on feedback from Micah Chappell and Richard Williams. Summary of Changes:

- Created a secondary option for TAG consideration to base requirements on parking spaces instead of dwelling units (Option B). This is based on the concern with original proposal (Option A) that there could be multiple multiplexes on a single site.
- Changed accessible parking wording so that the requirements only apply if a multiple is required to have accessible parking. Original proposal could be interpreted as requiring all multiplexes to provide accessible parking regardless if they have at least 4 units or not.
- Clarified that EVSE can be installed to serve multiple spaces.
- Clarified that EV charging infrastructure can serve non-accessible spaces adjacent to accessible spaces.
- Clarified how minimum required EV charging infrastructure serving accessible parking spaces counts toward primary requirements (options for A and B).

Comparing Option A and B EV Capable (EVC) Requirements

DUs	Parking Ratio	Parking	EVR	EVC A	EVC B	EV A/Parking	EV B/Parking
3	1	3	1	1	1	67%	67%
3	1.5	5	1	1	2	40%	60%
3	2	6	1	1	2	33%	50%

4	1	4	1	1	1	50%	50%
4	1.5	6	1	1	2	33%	50%
4	2	8	1	1	3	25%	50%
5	1	5	1	2	2	60%	60%
5	1.5	8	1	2	3	38%	50%
5	2	10	1	2	4	30%	50%
6	1	6	2	1	1	50%	50%
6	1.5	9	2	1	3	33%	56%
6	2	12	2	1	4	25%	50%

Explanation:

The BFRW Committee based their 2024 code change for EV charging infrastructure based on the Northwest Power and Conservation Council’s 2021 Power Plan for a high EV adoption scenario (https://www.nwcouncil.org/2021powerplan_transportation-model-high-electric-case/).

Assumptions about EV charging behavior are based on the Avista Electric Vehicle Supply Equipment 2016-2019 Pilot Report. Available for download on their website: <https://www.myavista.com/energy-savings/electric-transportation>.

A lot of residential EV charging occurs in the evening, after people return home from work. One shared EV charger or receptacle has the potential to reasonably accommodate three different charging sessions in evenings. One for an occupant returning from work in the afternoon, one for an occupant returning from work at a regular time around 5 PM, and one for another occupant to plug in their EV to charge overnight. There is also the potential for the spot to be rotated in the morning for another charge for someone who leaves later in the morning and another charge during the day if a resident works from home or has a day off.

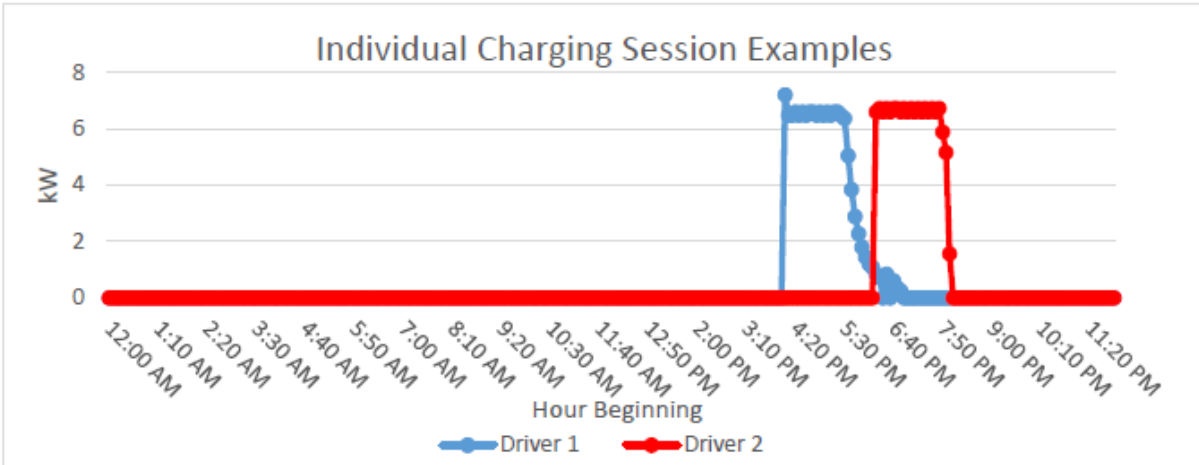


Figure 40. Example of individual residential EV charging sessions

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Charging sessions in multi-unit buildings tend to be much shorter on average than other building types, even public chargers. Indicating residents in multi-unit buildings share EVSEs and rotate EVs through common EVSE spaces to maximum charging sessions.

Session Charge Time by EVSE Type

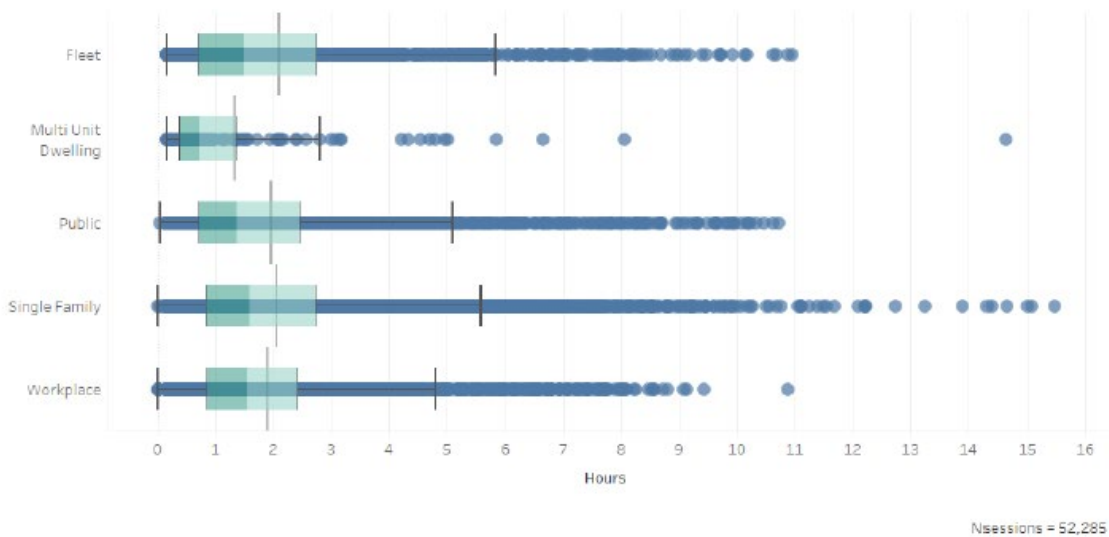


Figure 38: Charging Time by EVSE Type

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EVs may not even need to charge up to 100% regularly and it can be beneficial for the life of the battery to only charge up to 80%, this could further increase the amount of charging sessions a shared EVSE space could accommodate in a multi-unit building.

Therefore, if all EV ready/capable spaces are converted to EVSE spaces over the lifecycle of the multiplex, 2-3 EVSE spaces with an average of 3 charging sessions per day can reasonably accommodate up to 42-63 individual charging sessions a week. Each dwelling unit could have up to 7-10 charging sessions per week. This recommendation provides an ample amount of charging capacity over the lifecycle of the building while reducing the cost impact. It finds the middle ground between the WSRC requirements with the upcoming WSBC requirements. It also provides enough infrastructure to meet (and in some cases, exceed) the minimum requirements of RCW 19.27.540.