ICC INTERNATIONAL CODE COUNCIL®

Electric Vehicles and Building Codes: A Strategy for Greenhouse Gas Reductions

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INTRODUCTION

In 2019, the U.S. transportation sector accounted for 29 percent of the nation's greenhouse gas (GHG) emissions, with the demand for travel consistently increasing from 1990 to 2019.[1] The U.S. Federal Government has adopted decarbonization policies to reduce emissions, support green job growth, improve equity, and mitigate the impacts of climate change.

A major initiative of the U.S. Federal Government has been to reduce carbon pollution from the transportation sector. The adoption of electric vehicles (EVs) and implementation of EV infrastructure through building codes supports the national goal of achieving net-zero GHG emissions by 2050, which in turn supports the climate initiative of limiting global warming to 1.5 degrees Celsius.[2] In August of this year, the U.S administration released an Executive Order encouraging one-half of all new vehicles sold in 2030 to be zero-emissions vehicles, including battery electric, plug-in hybrid electric or fuel cell electric vehicles.[3] American automakers including Ford, General Motors and Stellantis, and the United Auto Workers, are aligning their EV targets in support of this goal.

The built environment will need to facilitate charging infrastructure that supports the increasing deployment of all classes (light-duty, medium-duty and heavy-duty) of EVs across the nation to meet GHG reduction targets. Buildings and building codes have been identified as important components in comprehensive, community-wide strategies to advance the deployment of EV charging infrastructure.

EV infrastructure requirements in building codes support the transition towards EV ownership by increasing access to parking spaces with charging stations. Current EV charging provisions in some state and local building codes typically require new buildings and major renovations to include a mixture of parking spaces with installed EV charging infrastructure and some with the necessary electrical equipment to support the future installation of EV charging equipment as EV use continues to grow. Published studies show that the installation of EV electrical equipment into new buildings can decrease installation costs of charging stations by up to 75 percent compared to installation during a building retrofit.[4]

ABOUT THIS DOCUMENT

In March 2021, the International Code Council's (Code Council's) Board of Directors issued a new framework to support advancements in energy efficiency and GHG reductions, *Leading the Way to Energy Efficiency: A Path Forward on Energy and Sustainability to Confront a Changing Climate*. The framework includes provisions for the development of technical and policy resources that provide communities with tools to support achievement of their energy efficiency and GHG reduction goals. The resources are intended to be useable independently and adopted alongside the baseline code to support community needs in specific areas.

This document presents the solutions select jurisdictions have enacted to support increased EV deployment. Also included is model language that communities can use to set their own policies. The model language is designed to provide communities with approaches that reflect local conditions and needs. This language follows a format that can be directly integrated into the International Codes (I-Codes®)–including the *International Energy Conservation Code*® (IECC®), *International Building Code*® (IBC®) and the *International Residential Code*® (IRC®)–and was compiled by the Code Council with input from interested stakeholders, as identified in the Appendix.

This document spells out placement of EV charging requirements within the IRC and IECC. The new scope and intent for the IECC moving forward (as defined by the Code Council Board of Directors) includes avenues for the inclusion of energy and GHG reduction requirements like EV charging. EV charging requirements could also be located in the IBC with the current EV requirements in Section 406.

In July 2021, The U.S. Department of Energy (DOE) and the Pacific Northwest National Laboratory (PNNL) developed a technical brief, *Electric Vehicle Charging for Residential and Commercial Energy Codes* with input from the Code Council. The language presented throughout the Code Council's resource is largely consistent with DOE and PNNL's technical brief, but provides flexibility for local jurisdictions on the number and type of EV spaces and reflects additional feedback received from a diverse set of stakeholders, listed within the resource's appendix.

1. U.S. Environmental protection Agency, "Sources of Greenhouse Gas Emissions," (2021).

2. The U.S. White House, "Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target...," (2021).

3. The U.S. White House, "Executive Order on Strengthening American Leadership in Clean Cars and Trucks," (2021).

4. Southwest Energy Efficiency Project, "EV Infrastructure Building Codes: Adoption Toolkit," (2020)

EV-related policy is evolving. This resource captures the prevailing strategies communities have already deployed. As strategies change, the Code Council will review this content to assure its continued relevance. Additionally, the content may be considered as the basis for EV-related criteria in future editions of the I-Codes which will allow for further development.

COMMON EV-INTEGRATED BUILDING CODE STRATEGIES

There are three EV parking space charging infrastructure strategies that building codes can include for new buildings: EV-Capable, EV-Ready and EVSE-Installed.

EV-Capable: Parking spaces that have the electrical panel capacity and conduit installed during construction to support future implementation of EV charging with 208/240-volt (or greater), 40-ampere (or greater) circuits. This strategy ensures the reduction of up-front costs for EV charging station installation by providing the electrical elements that are difficult to install during a retrofit. Anticipating the use of dual head EVSE, the same circuit may be used to support charging in adjacent EV-Capable spaces.

EV-Ready: Parking spaces that have full circuit installations of 208/240-volt (or greater), 40-ampere (or greater) panel capacity, raceway wiring, receptacle and circuit overprotection devices. This strategy provides all required electrical hardware for the future installation of EV Supply Equipment (EVSE). Anticipating the use of dual head EVSE, the same circuit may be used to support charging in adjacent EV-Ready spaces.

EVSE-Installed: EV Supply Equipment (EVSE) that is fully installed from the electrical panel to the parking space.

CURRENT APPROACHES TO EV-INTEGRATED CODES

Local governments have adopted various approaches to EV-integrated building codes. Table 1 highlights EV infrastructure code provisions that are currently implemented across several jurisdictions in North America. These approaches can help communities determine the best combination of EV space types and numbers to meet their individual GHG reduction targets.

International Green Construction Code – Model Code

The 2021 *International Green Construction Code*® (IgCC®) includes the following requirements:

501.3.7.3 ELECTRIC VEHICLE CHARGING FACILITIES.

Where 20 or more on-site vehicle parking spaces are provided for International Building Code (IBC) Occupancy Group A, B, E, F, I, M, and S buildings, not less than 4% of the total number of parking spaces or not less than 8% of designated employee only parking spaces shall be EV-Ready spaces. Where 10 or more on-site vehicle parking spaces are provided for IBC Occupancy Group R-1, R-2, and R-4 buildings, not less than 20% of the total number of parking spaces shall be EV-Ready spaces. The required number of EV-Ready spaces shall be rounded up to the next highest whole number.

Exception: Parking spaces designated for other than passenger vehicles are permitted to be excluded from the total number of on-site parking spaces.

California – State Level

California set ambitious targets for Zero Emission Vehicle (ZEV) charging infrastructure to support its mission of having five million ZEVs on the road by 2030. The state plans to install 250,000 shared plug-in electric vehicle chargers, including 10,000 direct current (DC) Fast Chargers (DCFCs) and 200 hydrogen stations, by 2050. The 2020 California Green Building Code (CALGreen) includes provisions for EV infrastructure requirements in new multifamily, residential and non-residential buildings, as well as stretch code requirements. Local governments can choose to adopt or surpass the CALGreen stretch codes for EV-Capable or EV-Ready spaces.

CALGreen requires new construction of multi-unit dwellings to include EV-Capable infrastructure in at least 10 percent of parking spaces. The two-tiered reach/stretch codes enable cities to adopt requirements for EV-Capable infrastructure in 15 percent or 20 percent of multi-unit development (MUD) parking spaces. CALGreen also established requirements for new construction single-family residences, duplexes and townhouses with private garages. The residential provisions

require EV-Capable capacity to support Level-2 (rated at 208/240 Volts) charging station installations. CALGreen also requires new construction non-residential buildings to have 6 percent of parking spaces that are EV-Capable, with reach codes supporting 8 percent and 10 percent capacity. The 2022 edition of CALGreen is currently under development and will be adopted by the California Building Standards Commission by early 2022 with an effective date of January 1, 2023. Proposed requirements include an increase to the number of EV-Capable and EV-Ready spaces.

Twenty jurisdictions in California have exceeded the minimum code requirements in their local code adoptions. Some municipalities are also implementing parking ordinances to encourage the installation of EV charging stations, specifically for new construction. Some jurisdictions are exploring adoption of EV infrastructure codes that address existing buildings including the City of Marin, City of Menlo Park, and the City and County of San Francisco. Such stretch codes target alterations and additions to provide opportunities for EV infrastructure installation in existing buildings.[5]

- Denver, Colorado – City Level

Denver, Colorado amended the 2018 IECC and IRC to include the following EV charging infrastructure requirements to meet its goal of electrifying 30 percent of all vehicles by 2030:

- **One- and two-family dwellings:** At least one EV-Ready parking space per dwelling unit.
- **Multifamily dwellings (3+ dwellings) with 10+ spaces:** 5% of parking spaces to be EV-Installed, 15% EV-Ready Parking Spaces, and 75% EV-Capable Parking Spaces.
- **Commercial buildings (Groups A, B, E, I, M, S-2) with 10+ spaces:** 5% of parking spaces to be EV-Installed, 10% EV-Ready Parking Spaces, and 10% EV-Capable Parking Spaces.
- **Building Alterations:** 'Level-3 Alterations', where the work area exceeds 50 percent of the original building area or where more than 10 parking spaces are substantially modified, are subject to the EV infrastructure requirements for both residential and commercial buildings.
- **DC Fast-charger provision:** For MUD and Commercial buildings, allow developers to substitute up to five Level-2 charging spaces with one DC fast-charging space (with a minimum rated power input of at least 20kW).[6]

- Winter Park, Florida – City Level

The City of Winter Park adopted an EV-Readiness Ordinance that amends both its Land Development Code and Building Code. Winter Park amended Section 58-86 "Off-street Parking and Loading Regulations" of its Land Development Code to include EV charging station infrastructure and parking space requirements. Under this amendment, non-residential properties with surface parking or parking structures are required to have a minimum of 10 percent of total parking spaces to be Level-2 EV-Ready. The EV charging infrastructure is required to be installed in accordance with the technical amendment made to the Florida Building Code (Chapter 22, Section 2703 of the City of Winter Park Code of Ordinances). The Land Development Code amendment also requires non-residential properties to provide, at minimum, 1 parking space equipped with a Level-2 EV charging station per every 20 required off-street parking spaces.

- Vancouver, BC – International/City Level

The City of Vancouver adopted Building Code Bylaw 10908, which requires EV charging infrastructure installation in new construction residential and commercial buildings. Single-family dwellings with garages are required to have at least one EV-Ready parking space per dwelling unit. Multifamily dwellings are required to have 100 percent of parking spaces be EV-Ready, while commercial buildings must have 10 percent of parking spaces be EV-Ready.[7]

Although the code requires EV-Ready for 100 percent of parking spaces in MUDs, there is no requirement to install the electrical capacity to charge all spaces at full power. Vancouver's code requirements encourage the use of EV energy management systems (EVEMS) to achieve a high level of plug-in electric vehicle readiness without the need for larger

5. California Governor's Office of Business and Economic Development, "Electric Vehicle Charging Station Permitting Guidebook," (First Edition: July 2019).

6. City of Denver Community Planning and Development, "Code Amendment Proposal," (2019).

7. City of Vancouver Building Policy Branch, "Electric Vehicle Charging of Buildings," (2021).

building electrical capacity upgrades. The City of Vancouver and other BC cities have adopted minimum performance requirements that dictate the maximum extent of load sharing that may be used, ensuring that EV charging infrastructure is capable of providing a high-quality experience for end-users.

Likewise, 12 other cities in BC, Canada, have adopted 100% EV Ready residential parking requirements for new construction.

TABLE 1: SAMPLE EV-INTEGRATED CODE PROVISIONS[8]

Municipality/State	Year	Process Type	Single-Family	Multifamily	Commercial
Orlando, FL	2021	Land Development Code	-	20% EV-Capable	10% EV-Capable, 2% EV-Installed (250+ spaces)
Avon, CO	2021	IECC / IRC	1 EV-Ready Space per dwelling Unit	5% EV-Installed, 10% EV-Ready, 15% EV-Capable (7+ spaces)	5% EV-Installed, 10% EV-Ready, 15% EV-Capable (10+ spaces)
St. Louis, MO	2021	IBC / IRC	1 EV-Ready Space per dwelling Unit	2% EV-Installed, 5% EV-Ready (increases to 10% in 2025)	2% EV-Installed, 5% EV-Ready
Madison, WI	2021	Zoning Code	-	2% EV-Installed, 10% EV-Ready (increases by 10% every 5 years)	1% EV-Installed (increases by 1% every 5 years), 10% EV-Ready (increases by 10% every 5 years)
Washington D.C.	2021	Green Building Ordinance	-	20% EV-Ready (3+ spaces)	20% EV-Ready (3+ spaces)
Summit County, CO	2020	Green Code	1 EV-Ready Space per dwelling Unit	5% EV-Installed, 10% EV-Ready, 40% EV-Capable (10+ spaces)	5% EV-Installed, 10% EV-Ready, 40% EV-Capable (25+ spaces)
Dillon, CO	2020	Green Code	1 EV-Ready Space per dwelling Unit	5% EV-Installed (at least 1 dual-port charging station), 10% EV-Ready, 40% of remaining spaces EV-Capable (10+ spaces)	5% EV-Installed (at least 1 dual-port charging station), 10% EV-Ready, 40% of remaining spaces EV-Capable (25+ spaces)
Breckenridge, CO	2020	Green Code	1 EV-Ready Space per dwelling Unit	5% EV-Installed, 10% EV-Ready, 40% EV-Capable (10+ spaces)	5% EV-Installed, 10% EV-Ready, 40% EV-Capable (25+ spaces)
Frisco, CO	2020	Green Code	1 EV-Ready Space per dwelling Unit	2 EV-Installed Spaces, 20% EV-Capable (26+ spaces)	2 EV-Installed Spaces, 20% EV-Capable (26+ spaces)
Salt Lake City, UT	2020	Zoning Code	-	1 EV-installed per 25 spaces (>5,000sf)	1 EV-Installed per 25 spaces (>5,000sf)
Denver, CO	2020	IECC / IRC	1 EV-Ready Space per dwelling Unit	5% EV-Installed, 15% EV-Ready, 80% EV-Capable	5% EV-Installed, 10% EV-Ready, 10% EV-Capable
Honolulu, HI	2020	IECC / IRC	1 EV-Capable Space per dwelling unit	25% EV-Ready (8+ spaces)	25% EV-Ready (12+ spaces)
Chicago, IL	2020	Zoning & Land Use Code		20% EV-Ready (5+ spaces)	20% EV-Ready (30+ spaces)
Lakewood, CO	2019	Zoning Ordinance	1 EV-Capable Space per dwelling unit	2% EV-Installed, 18% EV-Capable (10+ spaces)	2% EV-Installed, 13% - 18% EV-Capable (10+ spaces)
Flagstaff, AZ	2019	IBC / IRC	1 EV-Ready Space per dwelling Unit	3% EV-Ready	3% EV-Ready
Massachusetts	2019	IECC	-	-	1 EV-Ready space (15+ spaces)
Seattle, WA	2019	Land Use Code	1 EV-Ready Space per dwelling Unit	100% EV-Ready up to 6 space, 20% for parking lots with 7+ spaces	10% EV-Ready
Sedona, AZ	2019	IECC	1 EV-Capable Space per dwelling Unit	-	5% EV-Capable
Golden, CO	2019	Zoning Code	-	1 EV-Installed Space per 15 parking space, 15% EV-Capable	
San Jose, CA	2019	Reach/Green Code	1 EV-Ready Space per dwelling Unit	10% EV-Installed, 20% EV-Ready, 70% EV-Capable	10% EV-Installed, 40% EV-Capable
Fort Collins, CO	2019	NEC/IRC	1 EV-Capable Space per dwelling Unit	10% EV-Capable	-

8. Southwest Energy Efficiency Project, "EV Infrastructure Building Codes: Adoption Toolkit," (2020).

Vancouver, BC	2019	BC Building Code	1 EV-Ready Space per dwelling Unit	100% EV-Ready	10% EV-Ready
Oakland, CA	2018	Green Code	-	10% EV-Ready, 90% "Raceway Installed", 20% total panel capacity	10% EV-Ready, 10% "Raceway Installed", 20% total panel capacity
Atlanta, GA	2017	NEC	1 EV-Capable Space per dwelling Unit	20% EV-Capable	
Aspen, CO	2017	IBC / IRC	1 EV-Capable Space per dwelling Unit	3% EV-Capable (240V individual circuit branch with EV CAPABLE labelling)	-
San Francisco, CA	2017	Green Code	1 EV-Ready Space per dwelling Unit	10% EV-Ready, Panel Capacity for 20%, Raceway for 100%	
Palo Alto, CA	2017	Green Code	1 EV-Capable Space per dwelling Unit	1 EV-Ready Space per Unit, 20% EV-Capable for Guest Parking with 5% EV-Installed	20% EV-Capable, 5% EV-Installed
Oregon	2017	IBC	-	5% EV-Ready	
Boulder County, CO	2015	IBC / NEC / IRC	1 EV-Ready Space per dwelling Unit	2% EV-Ready (for new construction and 50% or 5,000 SF additions)	
Washington	2015	IBC	-	For Group B, Group R-1 hotel and motel only, Group R-2 occupancies: 5% of parking spaces shall be EV Capable. Size electrical room to serve 20% of spaces.	
New York City, NY	2013	IBC	-	20% EV-Capable	-
California (CALGreen)	2010	Green Code	1 EV-Capable Space per dwelling Unit	10% EV-Capable	

Note: Number of spaces in parentheses indicate the threshold where requirements begin.

MODEL CODE LANGUAGE

The code language provided below is based on input from stakeholders including the U.S. Department of Energy, Pacific Northwest National Laboratory and others listed in the Appendix, the content of code change proposals for the 2021 IECC, and strategies implemented in jurisdictions that have already adopted such policies, as compiled by the Code Council. This draft model code language can be used as a starting point for governments to adopt core EV infrastructure requirements into their building codes. These model requirements are intended to support consistency in approach and provide a degree of certainty for building owners, designers, contractors, manufacturers and building and fire safety professionals. As each jurisdiction is different, these provisions do not specify the number or percentage of spaces required for each building type or the EV parking space charging infrastructure strategies that should apply to each space—the jurisdiction should determine its requirements based on the sample provisions discussed above and captured in Table 1 as well as through community feedback.

BUILDING CODE AMENDMENTS FOR ELECTRIC VEHICLE CHARGING

RESIDENTIAL

Amend the International Energy Conservation Code Section R202 and/or International Residential Code Section N1101.6 to add the following definitions:

ELECTRIC VEHICLE. An automotive-type vehicle for on-road use primarily powered by an electric motor that draws current from an onboard battery charged through a building electrical service, electric vehicle supply equipment (EVSE), or another source of electric current.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The apparatus installed specifically for the purpose oftransferring energy between the premises wiring and the Electric Vehicle.

EV-CAPABLE SPACE. A dedicated parking space with electrical panel capacity and space for a branch circuit dedicated to the EV parking space that is not less than 40-ampere and 208/240-volt and equipped with raceways, both underground and surface mounted, to enable the future installation of electric vehicle supply equipment. For two adjacent EV-Capable spaces, a single branch circuit is permitted.

EV-READY SPACE. A designated parking space which is provided with a dedicated branch circuit that is not less than 40-ampere and 208/240-volt assigned for electric vehicle supply equipment terminating in a receptacle or junction box located in close proximity to the proposed location of the EV parking space. For two adjacent EV-Ready spaces, a single branch circuit is permitted.

Further amend the IECC-Residential and/or IRC by adding the following:

R103.2 Information on construction documents.

10. Electric Vehicle charging details and locations.

R401.4 (IRC N1101.15) ELECTRIC VEHICLE CHARGING. Where parking is provided, new construction shall provide electric vehicle spaces in compliance with Sections R401.4.1 through R401.4.4 (IRC N1101.15.1 through IRC N1101.15.3). Where more than one parking facility is provided on a site, electric vehicle parking spaces shall be calculated separately for each parking facility.

EXCEPTION: This section does not apply to parking spaces used exclusively for trucks or delivery vehicles.

R401.4.1 (IRC N1101.15.1) Electric vehicle ready circuit. The service panel shall provide sufficient capacity and space to accommodate the circuit and over-current protective device for each EV-Ready Space.

R401.4.2 (IRC N1101.15.2) New single family and two-family dwelling units. Single family and two-family dwelling units shall provide not less than [number] of [EVSE-Installed, EV-Ready Spaces and/or EV-Capable Spaces] per dwelling unit.

R401.4.3 New multifamily dwellings (three or more units). EVSE-Installed, EV-Ready Spaces and EV-Capable Spaces shall be provided in accordance with Table R401.4.3. Where the calculation of percent served results in a fractional parking space, it shall round up to the next whole number.

TABLE R401.4.3:

EVSE-INSTALLED, EV-READY AND EV-CAPABLE SPACE REQUIREMENTS

Total Number of Parking Spaces	Minimum number or % of EVSE-Installed Spaces[a]	Minimum number or % of EV-Ready Spaces[b]	Minimum number or % of EV-Capable Spaces
1			
2 – 10			
11 – 15			
16 – 19			

21 - 25			
26+	_# or _% of total parking spaces	_# or _% of total parking spaces	_# or_% of total parking spaces

a. Where EVSE-Installed Spaces installed exceed the required values in Table R401.4.3, the additional spaces shall be deducted from the EV-Ready Spaces requirement.

b. Where EV-Ready Spaces installed exceed the required values in Table R401.4.3 the additional spaces shall be deducted from the EV-Capable Spaces requirement.

R401.4.4 (IRC N1101.15.3) IDENTIFICATION. Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EVSE. Construction documents shall also provide information on amperage of future EVSE, raceway methods, wiring schematics and electrical load calculations to verify that the electrical panel service capacity and electrical system, including any on-site distribution transformers, meet the requirements of this code. Parking spaces equipped with EVSE shall be identified by signage. A permanent and visible "EV-Capable" or "EV-Ready" label shall be posted in a conspicuous place at the service panel to identify each panel space reserved to support EV-Capable or EV-Ready Spaces, respectively and at the termination point of the raceway or circuit termination point.

NOTES:

There are other important code references to examine in parallel to IECC/IRC Chapter 11 requirements. If not consistent with the latest editions, update:

- Section 625 of the National Electrical Code (NFPA 70)
- Section E3702.13 of the International Residential Code

See Section R328.10 of the International Residential Code and Section 1207.11.10 of the International Fire Code for provisions on the use of electric vehicles as energy storage systems.

COMMERCIAL

Amend the International Energy Conservation Code Section C202 to include the following definitions:

ELECTRIC VEHICLE. An automotive-type vehicle for on-road use primarily powered by an electric motor that draws current from an onboard battery charged through a building electrical service, electric vehicle supply equipment (EVSE), or another source of electric current.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The apparatus installed specifically for the purpose of transferring energy between the premises wiring and the Electric Vehicle.

EV-CAPABLE SPACE. A dedicated parking space with electrical panel capacity and space for a branch circuit that supports the EV parking space that is not less than 40-ampere and 208/240-volt and equipped with raceways, both underground and surface mounted, to enable the future installation of electric vehicle supply equipment. For two adjacent EV-Capable spaces, a single branch circuit is permitted.

EV-READY SPACE. A designated parking space which is provided with a dedicated branch circuit that is not less than 40-ampere and 208/240-volt assigned for electric vehicle supply equipment terminating in a receptacle or junction box located in close proximity to the proposed location of the EV parking space. For two adjacent EV-Ready spaces, a single branch circuit is permitted.

Further amend the IECC-Commercial by adding the following sections:

C103.2. Information on construction documents.

14. Electric Vehicle charging details and locations.

C401.4 Electric vehicle parking. Where parking is provided, new construction shall provide EVSE-installed spaces and facilitate future installation and use of EVSE through the provision of EV-Ready Spaces and EV-Capable Spaces provided in compliance with Sections C401.4.1 through C401.4.2, Where more than one parking facility is provided on a site, EVSE-installed, EV-Ready Spaces and EV-Capable Spaces shall be calculated separately for each parking facility.

C401.4.1 New commercial and multifamily buildings. EVSE-installed spaces, EV-Ready Spaces and EV-Capable Spaces shall be provided in accordance with Table C401.4.1 for Commercial buildings and Table C401.4.2 for multifamily buildings. Where the calculation of percent served results in a fractional parking space, it shall be rounded up to the next whole number.

The circuit shall have no other outlets. The service panel shall include an over-current protective device and provide sufficient capacity and space to accommodate the circuit and over-current protective device and the termination point shall be located in close proximity to the proposed location of the EV parking spaces.

TABLE C401.4.1

EVSE-INSTALLED, EV-READY SPACE AND EV-CAPABLE SPACE REQUIREMENTS FOR NEW COMMERICAL BUILDINGS

Total Number of Parking Spaces	Minimum number or % of EVSE-Installed Spaces[a]	Minimum number or % of EV-Ready Spaces[b]	Minimum number or % of EV-Capable Spaces
1			
2 – 10			
11 – 15			
16 – 19			
21 - 25			
26+	_# or _% of total parking spaces	_# or _% of total parking spaces	_# or_% of total parking spaces

a. Where EVSE-Installed Spaces installed exceed the required values in Table C401.4.1 the additional spaces shall be deducted from the EV-Ready Spaces requirement.

b. Where EV-Ready Spaces installed exceed the required values in Table C401.4.1 the additional spaces shall be deducted from the EV-Capable Spaces requirement.

TABLE C401.4.2

EVSE-INSTALLED, EV-READY AND EV-CAPABLE SPACE REQUIREMENTS FOR NEW MULTIFAMILY BUILDINGS

Total Number of Parking Spaces	Minimum number or % of EVSE-Installed Spaces[a]	Minimum number or % of EV-Ready Spaces[b]	Minimum number or % of EV-Capable Spaces
1			
2 – 10			
11 – 15			
16 – 19			
21 - 25			
26+	_# OR _% OF TOTAL PARKING SPACES	_# OR _% OF TOTAL PARKING SPACES	_# OR_% OF TOTAL PARKING SPACES

a. Where EVSE-Installed Spaces installed exceed the required values in Table C401.4.2 the additional spaces shall be deducted from the EV-Ready Spaces requirement.

b. Where EV-Ready Spaces installed exceed the required values in Table C401.4.2 the additional spaces shall be deducted from the EV-Capable Spaces requirement.

C401.4 IDENTIFICATION. Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EVSEs. Construction documents shall also provide information on amperage of future EVSE, raceway methods, wiring schematics and electrical load calculations to verify that the electrical panel service capacity and electrical system, including any on-site distribution transformers, comply with the requirements of this code. Vehicle spaces equipped with EVSE shall be identified by signage. A permanent and visible “EV-Capable” or “EV-Ready” label shall be posted in a conspicuous place at the service panel to identify each panel space reserved to support EV-Capable or EV-Ready Spaces, respectively and at the termination point of the raceway or circuit termination point

NOTES:

Jurisdictions adopting EV provisions that have not adopted the 2021 IBC must also amend earlier versions of the International Building Code to renumber Section 1109.14 Fuel-dispensing Systems and add the following language into Chapter 11:

SECTION 1107
MOTOR-VEHICLE-RELATED FACILITIES

1107.1 GENERAL. Electrical vehicle charging stations shall comply with Section 1107.2. Fuel-dispensing systems shall comply with Section 1107.3.

1107.2 ELECTRICAL VEHICLE CHARGING STATIONS. Electrical vehicle charging stations shall comply with Sections 1107.2.1 and 1107.2.2.

> **EXCEPTION:** Electrical vehicle charging stations provided to serve Group R-2, R-3 and R-4 occupancies are not required to comply with this section.

1107.2.1 NUMBER OF ACCESSIBLE VEHICLE SPACES. Not less than 5 percent of vehicle spaces on the site served by electrical vehicle charging systems, but not fewer than one for each type of electric vehicle charging system, shall be accessible.

1107.2.2 VEHICLE SPACE SIZE. Accessible vehicle spaces shall comply with the requirements for a van accessible parking space that is 132 inches (3350 mm) minimum in width with an adjoining access aisle that is 60 inches (1525 mm) minimum in width.

1107.3~~1109.14~~ FUEL-DISPENSING SYSTEMS.

Fuel-dispensing systems shall be *accessible*.

NOTES:

There are other important code references to examine in parallel to IECC. If not consistent with the latest editions update:

- Section 625 of the National Electrical Code (NFPA 70)
- Section 406.2.7 of the IBC

REFERENCE LIST

Electric Vehicle Charging Station Permitting Guidebook – California Office of Business and Economic Development

EV Infrastructure Building Codes: Adoption Toolkit – Southwest Energy Efficiency Project (SWEEP)

Final Code Amendment Proposal 2019 – City of Denver Community Planning & Development

Greenhouse Gas Emissions – U.S. EPA

IECC Commercial 2019 Group B Proposed Changes – International Code Council

Electric Vehicle Charging for Buildings – City of Vancouver Building Policy Branch

IECC Residential / IRC Energy 2019 Group B Proposed Changes – International Code Council

New Building Codes for Charging Electric Vehicles – Alliance to Save Energy (ASE)

2030 Greenhouse Gas Pollution Reduction Target (Fact Sheet) – U.S. White House

PRESENTED BY THE ICC FAMILY OF SOLUTIONS

21-20604

APPENDIX

STAKEHOLDERS PROVIDING INPUT

The following stakeholders participated in a listening session in January 2021 and/or August 2021 or provided feedback on a draft released for comment in July 2021. Participation in the listening sessions or providing feedback does not indicate support of the content of this resource. The content may not reflect the policies or positions of the individuals or organizations identified.

Sharon Bonesteel, Salt River Project

Joseph Briscar, Responsible Energy Codes Alliance

Joe Cain, Solar Energy Industries Association

Ed Carley, National Association of State Energy Officials

Andrew Carlson, Pyramid1

Kim Cheslak, New Buildings Institute

Patricia Chawla, Austin Energy

Sean Denniston, New Buildings Institute

Noelani Derrickson, Tesla

Ian Finlayson, State of Massachusetts

Matt Frommer, Southwest Energy Efficiency Partnership

Ken Gear, Leading Builders of America

Connie Jones, NetCommunications

Duane Jonlin, City of Seattle

Emily Kelly, ChargePoint

Vladimir Kochkin, National Association of Home Builders

Eric Lacey, Responsible Energy Codes Alliance

Renee Lani, American Public Gas Association

Stacey Meaders, NetCommunications

Jim Meyers, Southwest Energy Efficiency Partnership

Kevin Miller, ChargePoint

Shaunna Mozingo, Mozingo Code Group

Maurice Muia, Natural Resources Defense Council

Steve Orlowski, Window and Door Manufacturers Association

Christopher Perry, American Council for an Energy Efficient Economy

Michael Robinson, Stalite

Steve Rosenstock, Edison Electric Institute

Rob Salcido, Pacific Northwest National Laboratory

Charles Satterfield, Edison Electric Institute

Amy Schmidt, Dupont

Ryan Stanton, State of Tennessee

Mike Stone, National Electrical Manufacturers Association

Nick Thompson, City of Aspen

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