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REVving Up: Legal & Policy Changes to Support EV Uptake—Leader Jurisdictions

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Summary

Even as many experts predict that zero emission vehicles including electric vehicles will become a dominant North American transportation technology, many buildings are still being constructed across North America without EV-ready parking areas, raising the possibility of significant retrofitting costs down the road and likely delaying EV adoption for some residents.

This paper considers policy actions being taken by North American "leader jurisdictions" that have recognized the potential of EVs to reduce transportation-related greenhouse gas emissions and improve local air quality. It examines (1) requirements targeting the development and renovation of the built environment (building code amendments and municipal by-laws), (2) requirements targeting rules governing condominiums and landlord-tenant relationships and (3) property tax financing schemes (known to many US readers as PACE financing).

Keywords: EV (electric vehicle), EVSE, charging, municipal government, provincial government

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1 INTRODUCTION AND EXECUTIVE SUMMARY

Even as many experts predict that zero emission vehicles including electric vehicles ("EVs") will become a dominant North American transportation technology, many buildings are still being constructed across North America without EV-ready parking areas, raising the possibility of significant retrofitting costs down the road and likely delaying EV adoption for some residents. Many potential EV users, particularly those living in multi-unit residential buildings, face cost and technical barriers to adopting EVs because they do not have the ability to install the home or workplace electric vehicle supply equipment ("EVSE") needed to charge EVs.

This paper considers policy actions being taken by North American "leader jurisdictions" that have recognized the potential of EVs to reduce transportation-related greenhouse gas emissions and improve local air quality.

Leader jurisdictions are "future proofing" their building stocks through innovative policies that encourage EVSE installation including (1) requirements targeting the development and renovation of the built environment (building code amendments and municipal by-laws), (2) requirements targeting rules governing condominiums and landlord-tenant relationships and (3) property tax financing schemes (known to many US

readers as PACE financing). Direct subsidies, rebates and tax credits, while important, are not considered in this paper.

In leader jurisdictions, some or all of the following policy trends can be observed:

Regulation of the Built Environment

- Requirements targeting one- and two-family dwellings (typically with garages and carports), multi-unit residential buildings ("MURBs") and non-residential buildings, including commercial and industrial spaces.
- Many building owners are given a choice between installing actual EVSE and preparing parking spots for future EVSE installation through the use of cable raceways, provision of sufficient electrical room capacity and, in some cases, signage.
- Minimum requirements typically increase with the number of parking spots. Some include strict percentages of available spaces, while others increase based on ranges or bands.
- Policies to support public EVSE include:
    - Zoning rules permitting installation of fast EV chargers in certain zones and
    - Streamlined permitting processes and administrative approval of EVSE.

MURB and Rental Building Policies

- Restrictions intended to prevent landlords and homeowners' associations (similar to condo boards) from unreasonably withholding approval for tenant and resident requests to install EVSE.
- Restrictions on lease terms are geared at unreasonable prohibitions on installation of EVSE.
- Permission is granted to allocate increased electricity costs and installation costs to the person requesting installation, within reasonable limits.

Property Tax Financing

- Homeowners are given the ability to borrow funds to pay capital and installation costs of EVSE and to repay the loans on property tax bills.

While it is still too early to determine which policies are the most effective, leader jurisdictions including Vancouver, California and Colorado have implemented innovative solutions that may be helpful for other jurisdictions hoping to increase EVSE availability and EV uptake.

2 RATIONALES FOR EV-SUPPORTIVE POLICIES

Perceived cost and technical barriers associated with EVs tend to receive significant attention, but policy and structural barriers to the installation of EVSE are a major factor hindering EV adoption in North America. In a recent survey of "mainstream" and "PEV pioneer" British Columbia residents, only 19% of "mainstream" respondents had current access to a Level 2 charger and only 35% had the potential to install one.[1] Meanwhile, almost all, 97%, of "PEV pioneer" respondents reported having some form of home recharge access, the majority of which, 75%, had a Level 2 charger installed at home.[2]

It can be particularly difficult to find charging access in areas with parking garages or parking areas in which the individual user cannot easily and directly install EVSE without approval from a facility owner or manager. This includes workplace charging, which may be important to drivers who wish to run errands after work or have long commutes, and for MURBs. According to the BC survey, "[r]echarge access is proportionally higher among respondents living in detached and attached homes, and those parking their vehicle in a garage, driveway, or carport."[3] This makes it more difficult for residents living in MURBs, for example, to become early EV adopters. Indeed, of the few PEV pioneer respondents who lived in apartments, only 3% reported having access to a Level 2 charger.[4]

Preparing a parking spot in a MURB for EV charging can be relatively inexpensive if done during initial construction. Retrofitting a parking spot in an already-constructed MURB to allow for EV charging can be

1 Jonn Axsen et al, "Electrifying Vehicles: Insights from Canadian Plug-in Electric Vehicle Study" (July 2015) Simon Fraser University at 92, online: http://rem-main.rem.sfu.ca/papers/jaxsen/Electrifying_Vehicles_(FINAL)_V2.8_(July10).pdf.

2 *Ibid*.

3 *Ibid*.

4 *Ibid* at 93.

relatively more expensive and disruptive.[5] The additional cost of digging up cement to run wires, for example, can deter potential EV purchasers, since the majority of EV users charge at home.[6]

3 REGULATION OF THE BUILT ENVIRONMENT

3.1 EV-Supportive Policies for the Built Environment

Building code amendments and municipal by-laws or land use policies may help to facilitate EV adoption by improving the availability, accessibility and affordability of EVSE. Building codes generally regulate the construction, alteration, renovation and replacement of residential, industrial, commercial and other building types.[7] Building codes are often intended to protect public health and safety and provide protections from hazards associated with the built environment.[8] They may set standards for building facilities and features, including EV-supportive infrastructure. Some US states and the City of Vancouver, for example, have used their building code authority to implement significant EV-supportive requirements.

Other jurisdictions, including many Canadian municipalities, do not have building code authority. However, these municipalities may have opportunities to incorporate some or all of the elements used by leading states and cities through their land use authority, especially planning and zoning.

EV-supportive building code measures come in both mandatory and voluntary schemes, but appear to be trending toward mandatory enforcement in leader jurisdictions. In light of demand for workplace charging, leader jurisdictions appear to focus increasingly on residential and commercial or industrial buildings, or simply parking lots. While some building code rules mandate installation of EVSE, others provide for future-proofing (i.e., preparation for future installation with cable raceways or electrical room capacity).

Table 1, below, provides a summary of EV-supportive policy options for the built environment.

Table 1: Summary of EV-Supportive Policy Options for the Built Environment

Building Code Measure Category	Measure Options and Features
Compliance Requirement	• mandatory • voluntary • combination of mandatory and voluntary (e.g., baseline with more ambitious options)
Applicable Building Types	• one- or two-family dwellings • multi-unit residential buildings • office buildings with employee parking • industrial buildings with employee parking • commercial centres with customer parking • parking lots and garages
Equipment Requirement(s)	• EV charger or charging receptacle • separate branch circuit compatible with Level 2 EV charger (208 or 240 V) • cable raceway or other electrical conduit for future installation of EV-supportive wiring • capacity to provide individual accounting of electrical use for EV charging • signage for EV capable parking spaces

5 Guy Impey, *Electric Vehicle Charging – Impact Review for Multi–User Residential Buildings in British Columbia* (30 September 2013), UBC Social Ecological Economic Development Studies (SEED) at 4, online: http://sustain.ubc.ca/sites/sustain.ubc.ca/files/seedslibrary/CEEN 596 Electric Vehicle Charging - Impact Review for MURBs in B.C. Sept 30, 2013.pdf.

6 Judith Balmin, Greg Bonett & Megan Kirkeby, *Increasing Electric Vehicle Charging Access in Multi-Unit Dwellings in Los Angeles* (July 2012), UCLA Luskin School of Public Affairs at 4, online: http://luskin.ucla.edu/sites/default/files/EV%20Charging%20in%20LA%20MUDs.pdf.

7 See e.g., *Building Code Act, 1992*, SO 1992, c 23, s 8. This provision requires a permit for the construction or demolition of a building. The permit may be refused if the proposed construction or demolition would contravene the Building Code or the *Building Code Act, 1992*. In Ontario, "construction" is defined as doing "anything in the erection, installation, extension or material alteration or repair of a building and includes the installation of a building unit fabricated or moved from elsewhere". or a change of use *Building Code Act*, s 10(1).

8 International Code Council, "Overview of the IBC (International Building Code)", online: http://www.iccsafe.org/codes-tech-support/codes/2015-i-codes/ibc/.

Building Code Measure Category	Measure Options and Features
Quantitative EV Specifications	• percentage-based quantitative requirement (e.g., 3-20% of parking spaces) • alternative quantitative requirement (e.g., 1 parking space in the 51-100 band)
Installation or Future-Proofing	• installation of EVSE • preparation for future installation of EVSE through installation of cable raceways, electrical room capacity, etc.
Planning and Zoning	• zoning policy permissive of EVSE installation • streamlined permitting process for EVSE installation • process for easy administrative approval of EVSE installation requests

3.2 Leader Jurisdictions

In part A of this section, we focus on the role of building codes in facilitating EV adoption by providing a detailed overview of the building code amendments undertaken in the City of Vancouver, the State of California, Boulder County in the State of Colorado, the City of New York, and the State of Hawaii. We summarize the EV-supportive building code measures of leader jurisdictions in Table 2.

In part B of this section, we discuss the significance of municipal land use planning authority (specifically, planning and zoning authority) in facilitating EV adoption by summarizing policies in place in the City of Dieppe in New Brunswick and the State of California. We summarize the land use planning and zoning measures of leader jurisdictions in Table 3.

A. Building Code Authority

In leader jurisdictions, the following trends can be observed:

- Requirements focus on one- and two-family dwellings (typically with garages and carports), MURBs, and also extend to non-residential buildings, including commercial and industrial spaces and parking lots.
- Many building owners are given a choice between installing actual EVSE and preparing parking spots for EVSE through the use of cable raceways, electrical room capacity and, in some cases, signage.
- Specifications typically increase with the number of parking spots. Some codes use strict percentages, while others increase based on ranges set out in tables.

Table 2: Summary of EV-Supportive Built Environment Measures Across Jurisdictions

	Applicable Building Types	Summary of EV Equipment Requirement(s)	Quantitative EV Specifications (min. % of parking spaces)	Installation (I), Wiring (W), Raceway (R)
City of Vancouver	• one- and two-family dwellings • MURBs • commercial buildings	• electrical outlet box wired with separate branch circuit or, under certain circumstances, a raceway for one- and two-family dwellings • installation of EV charging receptacle for MURBs and commercial centres	• 20% – MURBs • 10% – commercial buildings	**W** or, under certain circumstances, **R** – one- and two-family dwellings **I** – multi-unit residential and commercial buildings

	Applicable Building Types	Summary of EV Equipment Requirement(s)	Quantitative EV Specifications (min. % of parking spaces)	Installation (I), Wiring (W), Raceway (R)
*California's green building standards include those that municipalities must adopt (m) and may voluntarily adopt (v).				
State of California	• one- and two-family dwellings • MURBs • nonresidential buildings	• one- and two-family dwellings: service panel and raceways (m) or installation of branch circuit (v) • MURBs >17 units where only 1 EVCS (defined below) is required to meet 3% (m): raceway • MURBs >17 units where more than 1 EVCS is required to meet 3% (m): no equipment requirements but certain construction document identification requirements • MURBs >17 units (v): EVCSs capable of supporting future EVSE • nonresidential buildings: raceway (m/v) • signage requirements	• 3% (m), 5% (v) – MURBs (>17 units) • 3% (m), 4 or 6% (v) – nonresidential buildings • alternative quantitative requirements for certain bands of parking spaces	**R** (m); **W** (v) – one- and two-family dwellings **R** (m/v) – certain MURBs **R** (m/v) – nonresidential
Boulder County	• commercial, industrial, MURBs (and additions and alterations thereto) • garages or carports in one- and two-family dwellings	• commercial, industrial, MURBs – Level 2 EV charger • garages/carports – Level 2 EV charger or upgraded wiring for future installation or electrical conduit for ease of future installation	• >501 parking spaces – 2% • quantitative requirements for bands <501 parking spaces	**I** – commercial, industrial, MURBs **I** or **W** or **R** – garages and carports

City of New York	• most parking garages
	• most open parking lots
	• exceptions:
	  • mercantile buildings
	  • temporary parking
	  • lower-income buildings
		• raceway and electrical capacity to support EV charging stations	• 20% – parking lots
			• 20% – open garages
				R – parking garages and lots, with exceptions

State of Hawaii	• parking lots at places of public accommodation with at least 100 parking spaces	• system capable of providing electricity to the batteries of an EV	• at least one per 100 parking spaces	**I** – parking lots with at least 100 parking spaces

3.2.1 City of Vancouver

The *Vancouver Building By-law* ("VBBL")[9] requires that one- and two-family dwellings, MURBs and commercial buildings are equipped with either EV-supportive wiring and circuitry or a raceway. The requirement applies to a proportion of parking spaces in MURBs (20%) and commercial buildings (10%).

The Council of the City of Vancouver is empowered under the *Vancouver Charter* to adopt by-laws regulating the construction of buildings under certain circumstances, including "where the conservation of energy or water is concerned" and "where the reduction of greenhouse gas emissions is concerned". [10] The Council has adopted the VBBL as the building code for the City of Vancouver.[11] In 2011, the City updated

[9] City of Vancouver, by-law 10908, *Vancouver Building By-law* (1 April 2014) [*VBBL*].

[10] *Vancouver Charter*, SBC 1953, c55, ss 306(1), 306(1)(a)(v) and 306(1)(a)(vi).

[11] City of Vancouver, "Vancouver Building By-law 9419" (26 May 2014), online: http://vancouver.ca/your-government/vancouver-building-by-law.aspx.

the VBBL to include EV charging infrastructure requirements. These requirements came into force on April 20, 2011.[12] The current version of the VBBL came into force on January 1, 2015.[13]

VBBL-Specific Definitions

In order to properly assess the EVSE regime under the VBBL, we set out the following definitions, which are specific to the context of the VBBL. **Dwelling unit** is defined as "a suite operated as a housekeeping unit, used or intended to be used by one or more persons and usually containing cooking, eating, living, sleeping and sanitary facilities",[14] where a **suite** is "a single room or series of rooms of complementary use, operated under a single tenancy".[15] A **one-family dwelling** contains only one dwelling unit,[16] whereas a **two-family dwelling** has only two self-contained dwelling units.[17] **Secondary suite** refers to the "area of a building that is intended to be a dwelling unit that is smaller than the principal residence in the same building."[18] A **lock-off unit** is "a smaller dwelling unit within a larger principal dwelling unit, which must have separate external access and shared internal access, and which can be locked off from the larger dwelling unit".[19] A **laneway house** is "a detached dwelling unit constructed in the rear yard of a parcel on which is situate a one-family dwelling or one-family dwelling with secondary suite."[20]

Applicable Building Types

The EV charging infrastructure requirement applies to one- and two-family dwellings and laneway houses (including those with secondary suites or lock-off units) with storage garages or carports, MURBs with parking stalls used by owners or occupiers of dwelling units and commercial buildings with parking stalls.[21]

Technical EV Equipment Requirements

Generally, the requirements applicable to one- and two-family dwellings and laneway houses mandate preparation for future installation of EV charging receptacles, while the requirements applicable to MURBs and commercial buildings mandate installation of receptacles for charging EVs.

The storage garages or carports of one- and two-family dwellings and laneway houses (including those with secondary suites or lock-off units) shall be provided with an electrical outlet box wired with a separate branch circuit capable of supplying 40 amps at 240 volts (targeted at standard Level 2 charging) that is labeled to identify its intended use.[22] Where this requirement would cause demand load to exceed 200 amperes, the installation of a 40 ampere branch circuit may be omitted if a raceway is not less than 21 mm in diameter leading from the dwelling panel board to an electrical outlet box is installed in the storage garage or carport and labeled to identify its intended use.[23]

Parking stalls in MURBs and commercial buildings "shall be designed with"[24] receptacles for charging electric vehicles that are supplied by a separate branch circuit rated not less than 40 amps at the nominal alternating current of 208 volts or 240 volts, as applicable.[25]

Quantitative EV Specifications

For MURBs and commercial buildings, the VBBL provides quantitative specifications for the proportion of parking spaces that must be designed with a receptacle for charging electric vehicles.[26] 20% of parking stalls

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12 City of Vancouver, "Electric vehicle charging requirements" (22 August 2012), online: http://vancouver.ca/home-property-development/electric-vehicle-charging-requirements.aspx.

13 City of Vancouver, "Vancouver Building By-law 9419" (26 May 2014), online: http://vancouver.ca/your-government/vancouver-building-by-law.aspx.

14 *VBBL*, s 1.4.1.2(1), *sub verbo* dwelling.

15 *VBBL*, s 1.4.1.2(1), *sub verbo* suite.

16 *VBBL*, s 1.4.1.2(1), *sub verbo* one-family dwelling.

17 *VBBL*, s 1.4.1.2(1), *sub verbo* two-family dwelling.

18 *VBBL*, s 1.4.1.2(1), *sub verbo* secondary suite.

19 *VBBL*, s 1.4.1.2(1), *sub verbo* lock-off unit.

20 *VBBL*, s 1.4.1.2(1), *sub verbo* laneway house.

21 *VBBL*, ss 10.2.3.1(1), 10.2.3.1(3) and 10.2.3.1(4).

22 *VBBL*, s 10.2.3.1(1). Recent anecdotal comments from EV technical experts suggest that new EV models may require increased amperage (e.g., 50 amps).

23 *VBBL*, s 10.2.3.1(2).

24 *VBBL*, ss 10.2.3.1(3) and 10.2.3.1(4).

25 *VBBL*, s 10.2.3.1(5).

26 *VBBL*, ss 10.2.3.1(3) and 10.2.3.1(4). "Receptacle" is not defined in the by-law.

used by owners or occupiers of dwelling units in a MURB must be designed with a receptacle for charging electric vehicles.[27] 10% of all parking stalls in a commercial building must be designed with a receptacle for charging electric vehicles.[28]

In addition to the installation requirements, the VBBL also allows for increasing the proportion of parking spaces fitted with EV charging receptacles at a future date. In MURBs, an electrical room shall be designed with sufficient space for the future installation of electrical equipment necessary to support the installation of receptacles, supplied by the branch circuits for charging electric vehicles, in all residential parking stalls."[29]

3.2.2 State of California

The 2013 California Green Building Standards Code ("CALGreen")[30] requires that one- and two-family dwellings and MURBs be equipped with identified EV-capable parking spaces and nonresidential buildings be equipped with raceways. The requirement applies to 3% of parking spaces in MURBs and nonresidential buildings.

Initially, CALGreen adopted voluntary EV-supportive measures. The provisions were "not mandatory unless specifically adopted by a State agency or adopted by a city, county, or city and county".[31] On September 28, 2013 the Governor of California approved legislation requiring the California Building Standards Commission to adopt, approve, codify and publish mandatory building standards for the installation of future electric vehicle charging infrastructure for parking spaces in MURBs and nonresidential developments.[32] On July 1, 2015, a supplement was released that amended the voluntary EV-supportive measures and added new mandatory measures.[33] The description that follows reflects the July 1, 2015 supplement. CALGreen also offers more ambitious voluntary measures that may be adopted by municipalities.[34] If adopted, voluntary measures generally require implementing an additional layer of EV-supportive measures. For example, a requirement for installation may replace a mandatory requirement to prepare for future installation.

CALGreen-Specific Definitions

The following definitions are specific to California. **Electric Vehicle Charging Station(s) ("EVCS")** is defined as "one or more spaces intended for charging electric vehicles".[35] **Electric Vehicle Supply Equipment ("EVSE")** is defined as 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 for the purpose of transferring energy between the premises and the electric vehicle".[36]

Applicable Building Types

CALGreen's EV charging measures—both mandatory and voluntary—apply to one- and two-family dwellings and townhouses with attached private garages, MURBs and nonresidential buildings.[37]

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27 *VBBL*, s 10.2.3.1(3).

28 *VBBL*, s 10.2.3.1(4) [emphasis added].

29 *VBBL*, s 10.2.3.2(1).

30 *California Green Building Standards Code* (2013).

31 *California Green Building Standards Code* (2013), Chapter 1: Administration, s 101.4.

32 US, AB 1092, *An act to add Section 18941.10 to the Health and Safety Code, relating to building standards*, 2013, Reg Sess, Cal, 2013, s 1.

33 *California Green Building Standards Code* (2013, rev July 1, 2015), Revision Record (Item No. 5570S133).

34 See *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 4A: Residential Voluntary Measures, s A4.106.8 and Appendix 5A: Nonresidential Voluntary Measures, s A5.106.5.3.

35 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 2: Definitions, *sub verbo* Electric Vehicle Charging Station(s).

36 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 2: Definitions, *sub verbo* Electric Vehicle Supply Equipment.

37 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4; Chapter 5: Nonresidential Mandatory Measures, s 5.106.5.3; Appendix 4A: Residential Voluntary Measures, s A4.106.8; Appendix 5A: Nonresidential Voluntary Measures, s A5.106.5.3.

Residential Buildings — Technical EV Equipment Requirements and Quantitative Specifications

Mandatory Measures

For one- and two-family dwellings, CALGreen requires installation of a trade size 1 (nominal 1-inch inside diameter) raceway to accommodate a 208/240-volt branch circuit, originating at the main service or subpanel and terminating into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger.[38] Raceways must be continuous at enclosed or concealed areas and spaces.[39] The service panel and/or subpanel is required to provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.[40] The service panel or subpanel circuit directory must identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE".[41] The raceway termination location must also be permanently and visibly marked as "EV CAPABLE".[42]

CALGreen's quantitative specifications for EV-capable parking spaces alter the technical EV equipment requirements that apply to MURBs. Where 17 or more dwelling units are constructed on a building site, 3% of the total number of parking spaces provided for all types of parking facilities, but in no case less than one parking space, shall be EVCSs capable of supporting future EVSE and shall be so identified on construction documents.[43] Calculations for the number of EVCSs required shall be rounded up to the nearest whole number.[44] CALGreen also mandates that one in every 25 EVCSs shall be an accessible parking space.[45]

Where 3% constitutes only one EVCS, that parking space shall meet requirements identical to those for a one- or two-family dwelling.[46] Where 3% constitutes more than one, construction documents shall indicate the raceway termination point and proposed location of future EVCSs and EV chargers.[47] Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify that the electrical panel service capacity and electrical system, including any on-site distribution transformer(s) have sufficient capacity to simultaneously charge all EVs at all required EVCSs at the full rated amperage of the EVSE.[48] Plan design shall be based upon a 40-ampere minimum branch circuit. Raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.[49] For all EVCSs in MURBs, identification at the service panel shall indicate "EV CAPABLE."[50]

Voluntary Measures

CALGreen's voluntary measures relating to one- and two-family dwellings, if adopted by a municipality, require the installation of dedicated 208/240-volt branch circuit in the raceway required under the mandatory measures.[51] The voluntary measures also require that the branch circuit and associated overcurrent protective device is rated at 40 amperes minimum.[52] The service panel circuit directory shall identify the receptacle and overcurrent protective device designated for future EV charging purposes as "EV READY."[53]

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38 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.1. Note that the term "EV charger" is used in CALGreen.

39 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.1.

40 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.1.

41 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.1.1.

42 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.1.1.

43 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.2.

44 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.2.

45 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.2.2.

46 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.2.3.

47 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.2.4.

48 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.2.4.

49 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.2.4.

50 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 4.106.4.2.5.

51 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 4A: Residential Voluntary Measures, s A4.106.8.1. See also text accompanying *supra* note 40.

52 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 4A: Residential Voluntary Measures, s A4.106.8.1.

53 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 4A: Residential Voluntary Measures, s A4.106.8.1.1.

For MURBs, where 17 or more units are constructed on a building site, 5% of the total number of parking spaces provided for all types of parking facilities, but in no case less than one, shall be EVCS capable of supporting future EVSE and shall be identified on construction documents.[54]

Nonresidential Buildings — Technical EV Equipment Requirements and Quantitative Specifications

Mandatory Measures

Nonresidential buildings must comply with CALGreen Table 5.106.5.3.3, below.[55] Buildings with 51 parking spaces and more require a raceway at the time of construction.[56] Specific construction plans and specifications apply and differ depending on whether one or multiple charging spaces are required.[57]

Nonresidential Mandatory Measures: CALGreen Table 5.106.5.3.3

Total Number of Parking Spaces	Number of Required EV Charging Spaces
0-50	0
51-75	1
76-100	2
101-200	3
201 and over	3% (rounded up)

All nonresidential buildings with EVCS require identification at the service panel that indicates "EV CAPABLE."[58]

Voluntary Measures

CALGreen's voluntary measures, if adopted, substitute two alternative tables for Table 5.106.5.3.3 in the mandatory measures.[59] The technical EV equipment requirements are the same as those under the mandatory measures.[60] Table A5.106.5.3.1 applies to CALGreen Tier 1 buildings.[61] Table A5.106.5.3.2 applies to CALGreen Tier 2 buildings.[62]

Nonresidential Voluntary Measures: CALGreen Table A5.106.5.3.1 (Tier 1)

Total Number of Parking Spaces	Tier 1 Number of Required EV Charging Spaces
0-50	1
51-75	2
76-100	3
101-200	5
201 and over	4% (rounded up)

Nonresidential Voluntary Measures: CALGreen Table A5.106.5.3.2 (Tier 2)

Total Number of Parking Spaces	Tier 2 Number of Required EV Charging Spaces
0-50	2
51-75	3
76-100	4
101-200	7
201 and over	6% (rounded up)

54 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 4A: Residential Voluntary Measures, s A4.106.8.2.

55 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 5: Nonresidential Mandatory Measures, s 5.106.5.3.3.

56 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 5: Nonresidential Mandatory Measures, ss 5.106.5.3.1 and 5.106.5.3.2.

57 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 5: Nonresidential Mandatory Measures, ss 5.106.5.3.1(1–5) and 5.106.5.3.2(1–5).

58 *California Green Building Standards Code* (2013, rev July 1, 2015), Chapter 4: Residential Mandatory Measures, s 5.106.5.3.4.

59 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 5A: Nonresidential Voluntary Measures, s A5.106.5.3.

60 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 5A: Nonresidential Voluntary Measures, ss A5.106.5.3.1 and A5.106.5.3.2. See also text accompanying *supra* note 56.

61 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 5A: Nonresidential Voluntary Measures, s A5.106.5.3.1.

62 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 5A: Nonresidential Voluntary Measures, s A5.106.5.3.2.

All nonresidential buildings with EVCS require identification at the service panel that indicates "EV CAPABLE."[63]

3.2.3 Boulder County, Colorado

The Boulder County Building Code[64] requires that commercial, industrial and multiple-family residential buildings are equipped with a Level 2 EV charging outlet. The requirement applies to a proportion of parking spaces. It also requires that one- and two-family dwellings with garages or carports are equipped with a Level 2 EV charging outlet, upgraded wiring to accommodate the future installation of a Level 2 EV charging outlet or an electrical conduit to allow ease of future installation of such a charging outlet.

Boulder County in Colorado adopted the 2015 International Building Code and the 2015 International Residential Code as parts of the Boulder County Building Code by reference. These adoptions include EV-supportive requirements that entered into effect on January 1, 2016. The 2012 International Residential Code, previously adopted in Boulder County, also contained EV-supportive requirements for one- and two-family dwellings.[65]

Applicable Building Types

The EV-supportive requirements in Boulder County apply to new commercial, industrial or multiple-family residential buildings (and alterations thereto, within specified parameters) and "every new garage or carport that is accessory to a one- or two-family dwelling or townhouse".[66]

Commercial, Industrial or Multiple-Family Residential Buildings

The Boulder County Building Code requires that all new commercial, industrial or multiple-family residential buildings (or additions or alterations to existing buildings of those types that increase the existing total floor area of the building by either fifty percent or by 5,000 square feet) are equipped with Level 2 (240-volt) EV charging receptacle outlets.[67] The proportion of parking spaces equipped with EV charging outlets must comply with Table K111.4, below. [68] Charging receptacle outlets shall be installed in accordance with the requirements of article 625 of the Electrical Code.[69]

Electric Vehicle (EV) Charging Receptacle Outlets (IBC Appendix Chapter K, Table K111.4)

Total Number of Parking Spaces	Required Minimum Number of EV Charging Outlets
1-19	0
20-50	1
51-100	2
101-150	3
151-200	4
201-250	5
251-300	6
301-350	7
351-400	8
401-450	9
451-500	10
501 and over	2% of total

63 *California Green Building Standards Code* (2013, rev July 1, 2015), Appendix 5A: Nonresidential Voluntary Measures, s A5.106.5.3.3.

64 See Boulder County, *Boulder County Building Code Amendments*, Resolution 2015-104: Amendments to Boulder County Building Code (eff 1 January 2016), adopting the 2015 International Building Code and the 2015 International Residential Code, with amendments.

65 Boulder County, *Boulder County Building Code Amendments*, Resolution 2012-50: Amendments to Boulder County Building Code (eff 1 January 2013), s R327.1 at 44-45.

66 Boulder County, *Boulder County Building Code Amendments*, Resolution 2015-104: Amendments to Boulder County Building Code (eff 1 January 2016), s R329.1 at 33.

67 Boulder County, *Boulder County Building Code Amendments*, Resolution 2015-104: Amendments to Boulder County Building Code (eff 1 January 2016), s K111.4 at 19.

68 Boulder County, *Boulder County Building Code Amendments*, Resolution 2015-104: Amendments to Boulder County Building Code (eff 1 January 2016), s K111.4 at 20.

69 Boulder County, *Boulder County Building Code Amendments*, Resolution 2015-104: Amendments to Boulder County Building Code (eff 1 January 2016), s K111.4 at 19.

One- and Two-Family Dwellings with Garages or Carports

The Boulder County Building Code requires that one- and two-family dwellings with garages or carports are equipped with a Level 2 (240-volt) EV charging outlet, upgraded wiring to accommodate the future installation of a Level 2 EV charging outlet or an electrical conduit to allow ease of future installation of such a charging outlet.[70]

3.2.4 City of New York

An amendment to the New York City Building Code[71] stated that parking garages and open parking lots (except those buildings listed below) must be equipped with raceways and capacity to support EV charging stations. The requirement applies to 20% of parking spaces in both types of parking facilities.

On December 17, 2013, the Mayor of New York signed into law "A Local Law to amend the administrative code of the city of New York and the New York city building code, in relation to electric vehicle charging stations in open parking lots and parking garages."[72]

Applicable Building Types

The EV-supportive requirements apply broadly to new, altered or replaced[73] "parking garages"[74] and "open parking lots",[75] but do not apply to parking garages and open parking lots (1) for buildings of occupancy group M (Mercantile),[76] (2) that are temporary[77] or (3) for "buildings in which not less than fifty percent of the residential units are for households earning up to sixty percent of the area median income as determined by the United States Department of Housing and Urban Development."[78]

Technical EV Equipment Requirements

Covered parking garages are required to be capable of supporting EV charging stations.[79] Specifically, an electrical raceway to the electrical supply panel and electrical room serving the garage must be capable of providing a minimum of 3.1 kW of electrical capacity to the prescribed proportion of parking spaces in the garage.[80] Open parking lots are also required to be capable of supporting EV charging stations.[81] The prescribed proportion of parking spaces in an open parking lot must be equipped with an electrical raceway capable of providing a minimum supply of 11.5kVA to an EVSE[82] from an electrical supply panel.[83] The raceway is required to be no smaller than 1 inch in diameter. The electrical supply panel serving such parking spaces must have at least 3.1 kW of available capacity for each stall connected to it with the raceway.[84]

Quantitative EV Specifications

Covered parking garages and open parking lots must be capable of supporting EV charging stations for at least 20% of the parking spaces.[85]

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70 Boulder County, *Boulder County Building Code Amendments*, Resolution 2015-104: Amendments to Boulder County Building Code (eff 1 January 2016), s R329.1 at 33.

71 City of New York, local law 2013/130, "A Local Law to amend the administrative code of the city of New York and the New York city building code, in relation to electric vehicle charging stations in open parking longs and parking garages", (17 December 2013), §3.

72 *Ibid*.

73 City of New York, *New York City Building Code* (2014), s 101.2.

74 City of New York, *New York City Building Code* (2014), s 406.2.11.

75 City of New York, *New York City Building Code* (2014), s 406.7.11.

76 City of New York, *New York City Building Code* (2014), ss 406.2.11(1) and 406.7.11(1)).

77 City of New York, *New York City Building Code* (2014), ss 406.2.11(2) and 406.7.11(2)).

78 City of New York, *New York City Building Code* (2014), ss 406.2.11(3) and 406.7.11(3)).

79 City of New York, *New York City Building Code* (2014), s 406.2.11.

80 City of New York, *New York City Building Code* (2014), s 406.2.11.

81 City of New York, *New York City Building Code* (2014), s 406.7.11.

82 This term is used to indicate EV "charger". See City of New York, local law 2013/130, "A Local Law to amend the administrative code of the city of New York and the New York city building code, in relation to electric vehicle charging stations in open parking longs and parking garages", (17 December 2013), §1.

83 City of New York, *New York City Building Code* (2014), s 406.7.11.

84 City of New York, *New York City Building Code* (2014), s 406.7.11.

85 City of New York, *New York City Building Code* (2014), ss 406.2.11 and 406.7.11.

3.2.5 State of Hawaii

Applicable Building Types

In Hawaii, places of public accommodation with at least one hundred parking spaces available for use by the general public are required to have at least one parking space exclusively for electric vehicles and equipped with an electric vehicle charging system.[86] The designation of such a parking space may not interfere with accessibility requirements and guidelines.

Hawaii-Specific Definitions

"[E]lectric vehicle charging system" means a system that is capable of providing electricity from a non-vehicle source to charge the batteries of one or more EVs, meets recognized standards, as defined, and is designed and installed in compliance with article 625 of the National Electrical Code.[87]

B. Land Use Authority: Planning and Zoning

Some leader jurisdictions have also adopted supportive land use planning requirements to support EV uptake and public charging. Examples are set out in Table 3.

Table 3: Summary of EV-Supportive Land Use Policies Across Jurisdictions

	Applicable Zone Types	Summary of EV Land Use Policy	Summary of EV Equipment Requirement
City of Dieppe, NB	• all zones, except low-density residential zones	• high-voltage electric vehicle charging station may be authorized as an accessory use to permitted main or secondary uses	• high-voltage EVSE
State of California (Planning)	• cities • counties • cities and counties	• must adopt an ordinance that creates an expedited, streamlined permitting process for EVSE • must administratively approve all applications to install EVSE, with minimal restrictions and limitations	• compliance with art. 625 of the California Electrical Code

3.2.6 City of Dieppe, New Brunswick

The City of Dieppe, New Brunswick has included permissive EV-supportive language in its zoning regulations. A 2015 draft of a new City of Dieppe Zoning By-law includes a provision that permits "[a] high-voltage electric vehicle charging station [to be] authorized as an accessory use to permitted main or secondary uses in all zones" except low-density residential zones.[88] The Guide to Proposed Changes to the City of Dieppe Zoning By-law explains that high-voltage electric vehicle charging stations are allowed in most zones, except low-density residential zones, to promote alternative energy sources for vehicles.[89]

3.2.7 State of California

All cities, counties or cities and counties in California must adopt an ordinance that creates an expedited, streamlined permitting process for electric vehicle charging stations.[90] Cities and counties with 200,000 residents or more must adopt such an ordinance by September 30, 2016. All other cities and counties must adopt such an ordinance by September 30, 2017. The city or county will consult with the local fire department

86 Hawaii Revised Statutes, §291-71(a).

87 Hawaii Revised Statutes, §291-71(b) *sub verbo* "electric vehicle charging system".

88 City of Dieppe, Draft Zoning By-law (2015) at §3.54(1), online: http://dieppe.ca/en/servicesmunicipaux/resources/ZoningBylaw2015draft20150812ANGFINAL.pdf.

89 City of Dieppe, Guide to Proposed Changes to the City of Dieppe Zoning By-law (2015) at 11, online: http://dieppe.ca/en/servicesmunicipaux/resources/GuidedeschangementspropossarretdezonagepublicANGFINAL.pdf.

90 California Government Code, §65850.7(g)(1).

and the utility director in developing the ordinance. Under the legislation, "electric vehicle charging station" means any level of EVSE that is designed and built in compliance with article 625 of the California Electrical Code, and delivers electricity from a source outside an electric vehicle into a plug-in electric vehicle.[91]

Under the legislation, a city, county or city and county is also required to administratively approve an application to install electric vehicle charging stations through the issuance of a building permit or similar nondiscretionary permit.[92] Review of an application to install EVSE must be limited to the building official's review of whether it meets all health and safety requirements of local, state and federal law.[93] Limits apply to the requirements of local law.[94]

4. POLICIES TARGETED AT MULTI-UNIT RESIDENTIAL BUILDINGS AND RENTAL BUILDINGS

4.1 EV-Supportive MURB and Strata Policies

In addition to the standards that govern how buildings are designed and built, the operation of law in residential buildings in which parking space users cannot unilaterally decide to install EVSE can also serve as a significant barrier. Examples of where this can occur include condominium or strata buildings, where parking spaces are controlled by a board charter or similar set of rules and apartments, in which installation requires a landlord's or building manager's permission. Condominium or strata owners in existing buildings that have not been made EV-ready frequently report facing challenges finding a place to plug in.[95]

In each case, the requirement to get approval for EVSE installation, which is not guaranteed, can add to the often costly and time-consuming process of wiring existing parking spaces for EVSE, which can involve removing and then replacing concrete to run electrical cabling from existing wiring across common elements[96] and may even require altering another condominium or apartment building resident's parking space and installing a dedicated electrical sub-meter.

Table 4, below, provides a summary of EV-supportive MURB and strata policies.

Table 4: Summary of EV-Supportive MURB and Strata Policies

MURB and Strata Measure Category	Measure Options and Features
Applicable Building Types	• leased dwellings without pre-existing EVSE in a certain proportion of parking spaces, • leased premises in common interest communities (e.g., a strata or condominium corporation) • MURBs and townhouses • premises participating in a homeowners' association
Tenant/Owner Rights	• right to approval of request for EVSE installation • right to have lease provisions against EVSE installation declared void • right to freedom from landlord's unreasonable prevention of EVSE installation • right to charge tenant/resident for installation and increased electricity cost
EVSE Equipment Specifications	• Level 1 EVSE • Level 2 EVSE • compliance with electrical code requirements

91 California Government Code, §65850.7(i)(3).

92 California Government Code, §65850.7(b).

93 California Government Code, §65850.7(b).

94 For example, a city, county, or city and county may not deny an application for a use permit to install an electric vehicle charging station unless it makes written findings based upon substantial evidence in the record that the proposed installation would have a specific, adverse impact upon the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The findings shall include the basis for the rejection of potential feasible alternatives of preventing the adverse impact. See California Government Code, §65850.7(c). Additionally, any conditions imposed on an application to install an electric vehicle charging station shall be designed to mitigate the specific, adverse impact upon the public health or safety at the lowest cost possible. See California Government Code, §65850.7(e).

95 Condominium Homeowners Association of BC, *Installation of Electric Vehicle Charging Stations on Strata Properties in British Columbia* (August 1, 2014), online: http://www.choa.bc.ca/_updates/EVCS%20Report%20-%20FINAL.pdf.

96 *Condominium Act, 1998*, SO 1998, c 19, ss 1(1) and 97(2)(c).

4.2 Leader Jurisdictions

In leader jurisdictions, we observe the following general trends:

- Landlords and homeowners' associations (similar to condo boards) are prohibited from unreasonably withholding approval for tenant and resident requests to install EVSE.
- Lease terms that unreasonably prohibit installation of EVSE are restricted.
- Installation and increased electricity costs can be allocated to the tenant or resident, within reason.

Table 5, below, provides a summary of EV-supportive MURB policies in the State of California, State of Colorado, State of Hawaii and State of Oregon.

Table 5: Summary Table for EV-Supportive MURB Policies

	Applicable Building Types	Tenant/Owner Rights	Landlord/Common Interest Association Obligations	Restrictions	EVSE Equipment Specifications
State of California	• leased dwellings without pre-existing EVSE in >10% of parking spaces, when there are 5 or more parking spaces and the dwelling is not subject to rent control	• lease provisions prohibiting / unreasonably restricting installation / use of EVSE are void, subject to conditions	• landlord must approve written requests to install EVSE, subject to restrictions	• no right to install EVSE in more spaces than allotted • landlord entitled to charge reasonable amount if reserved space granted, subject to reasonable restrictions	• any level of EVSE • compliance with art. 625 of California Electrical Code
State of Colorado	• leased premises in common interest communities	• tenant in a common interest community may install EVSE in or on leased premises at own expense	• common interest communities must provide residents with an opportunity to charge EVs, subject to restrictions • common interest communities may not create restrictions on the installation/use of EVSE, subject to restrictions	• any landlord entitled to reimbursement for actual cost of electricity, installation, or for reserved space	• Level 1 (120 V AC) • Level 2 (240 V AC) • compliance with art. 625 of National Electrical Code
State of Hawaii	• multi-family residential dwelling owned by a person • townhouse owned by a person	• no person shall be prevented from installing EVSE on or near a parking space • lease provisions barring EVSE installation are unenforceable	• may not prevent installation of EVSE on or near a parking space, subject to restrictions	• common interest associations/other bodies may restrict placement/use of EVSE (may not prohibit use altogether)	N/A
State of Oregon	• owned premises participating in a homeowners' association or association of unit owners	• owner may apply to install EVSE for personal, non-commercial use in an area subject to his or her exclusive use, subject to certain conditions	• homeowners' association or association of unit owners may not prohibit installation/use of EVSE, subject to restrictions • must approve application within 60 days, subject to restrictions	• owner responsible for all costs	N/A

4.2.1 State of California

California law provides that the lessor of a dwelling must approve a leaseholder's written request to install EVSE at a parking space allotted for the leaseholder that meets certain requirements and complies with the lessor's procedural approval process for modification to the property.[97] The rule does not apply to residential rental properties when EVSE already exists for leaseholders in a ratio equal to or greater than 10% of the designated parking spaces, when parking is not provided, when there are fewer than five parking spaces or when the dwelling is subject to residential rent control. [98]

Furthermore, any term in a lease in force on or after January 1, 2015 that conveys any possessory interest in commercial property that either prohibits or unreasonably restricts the installation or use of EVSE in a parking space associated with the commercial property is void and unenforceable.[99] Reasonable restrictions on the installation of EVSE are permissible.[100] For example, there is no right to install EVSE in more parking spaces than are allotted to the leaseholder.[101] Furthermore, the lessor may charge the leaseholder a reasonable monthly rental amount if the installation of EVSE has the effect of granting the leaseholder a reserved parking space and such a space is not allotted in the lease.[102]

If lessor approval is required for the installation or use of EVSE, the application for approval shall not be wilfully avoided or delayed.[103]

Under the legislation, EVSE means any level of electric vehicle supply equipment station that is designed and built in compliance with article 625 of the California Electrical Code, as it reads on the effective date of the rule, and delivers electricity from a source outside an electric vehicle into a plug-in electric vehicle.[104]

4.2.2 State of Colorado

In Colorado, a tenant in a common interest community may install, at the tenant's own expense and for the tenant's own use, Level 1 (120 V AC) or Level 2 EVSE (240 V AC) on or in the leased premises.[105] A landlord must not assess or charge a tenant any fee for the placement or use of EVSE, except for reimbursement of the actual cost of electricity provided by the landlord and used by the EVSE, the actual cost of installation or to reserve a specific parking space, if necessary.[106] Additionally, common interest communities must provide residents with an opportunity to charge EVs and may not create restrictions on the installation or use of EVSE.[107]

In the Colorado legislation, "electric vehicle charging system" means a device that is used to provide electricity to a plug-in EV or plug-in hybrid vehicle, is designed to ensure that a safe connection has been made between the electric grid and the vehicle, and is able to communicate with the vehicle's control system so that electricity flows at an appropriate voltage and current level. It may be wall-mounted or pedestal style and may provide multiple cords to connect with electric vehicles. The system must be certified by Underwriters Laboratories or an equivalent certifier and must comply with the current version of article 625 of the National Electrical Code.[108]

4.2.3 State of Hawaii

Hawaiian law requires that no person shall be prevented by any of a variety of instruments and restrictions from installing EVSE on or near the parking stall of any multi-family residential dwelling or townhouse that

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97 California Civil Code, §1947.6(a).

98 California Civil Code, §1947.6(b).

99 California Civil Code, §1952.7(a)(1).

100 California Civil Code, §1952.7(a)(2). The legislation defines 'reasonable restrictions' as "restrictions […] that do not significantly increase the cost of the electric vehicle charging station or its installation or significantly decrease the charging station's efficiency or specified performance" at §1952.7(c)(3).

101 California Civil Code, §1952.7(a)(3).

102 California Civil Code, §1952.7(a)(4).

103 California Civil Code, §1952.7(e).

104 California Civil Code, §§1947.6(c) and 1952.7(c)(1).

105 Colorado Revised Statutes, §38-12-601(1)(a).

106 Colorado Revised Statutes, §38-12-601(1)(b).

107 Colorado Revised Statutes, §38-33.3-106.8(2).

108 Colorado Revised Statutes, §§38-12-601(6)(a) and 38-33.3-106.8(7)(a).

the person owns.[109] For example, provisions in leases excluding EVSE installation are unenforceable. Common interest associations and other bodies may adopt rules that reasonable restrict the placement and use of EVSE in the parking stalls of any MURB, provided that those restrictions do not prohibit the placement or use of EVSE altogether.[110]

4.2.4 State of Oregon

Under Oregon law, an owner may submit an application to install EVSE for the personal, non-commercial use of the owner, in compliance with certain requirements, in a parking space, on a lot or in any other area subject to the exclusive use of the owner.[111] A homeowners' association or association of unit owners may not prohibit installation or use of EVSE installed and used in compliance with the requirements and must approve a completed application within 60 days after the owner submits the application. The owner is responsible for all costs.

5. PROPERTY TAX OR PACE FINANCING

5.1 EV-Supportive Property Tax Financing

Municipalities in some jurisdictions are permitted to use property tax financing (known as PACE financing in many US jurisdictions), to encourage property owners to make energy efficiency upgrades. Under the simplest version of property tax financing, the municipality provides a loan for the upfront costs of installation for an energy-reducing product, with repayment obligations added to the borrower's property tax bill. Some municipalities have allowed coverage of home EVSE within property tax financing schemes.

Table 6, below, provides a summary of property tax/PACE EVSE financing design features.

Table 6: Summary of Property Tax/PACE Financing for EVSE

Design Feature Category	Measure Options and Features
Coverage	• capital • installation • both
Contractor Requirement	• program-approved • licensed • adherence to guidelines • good standing with professional bodies
EVSE Equipment Restrictions	• Level 1 EVSE • Level 2 EVSE • compliance electrical code requirements
Funding Limitations	• property-adjusted dollar amount • pre-determined dollar amount • full cost dollar amount • fair market value dollar amount
Other Requirements	• co-installation of solar PV • direct contractor payment

In comparison to traditional loans, property tax financing offers a variety of advantages including:

- Reaching a broad customer base. Financing can be made available to a broader range of property owners, including "those not eligible for conventional loans due to factors such as having limited

[109] Hawaii Revised Statutes, §196-7.5(a).
[110] Hawaii Revised Statutes, §196-7.5(b).
[111] Oregon Revised Statutes, § 94.762.

assets, being an unrated commercial entity, not having available property for security or not having sufficient equity in the property to support a secured mortgage."[112]

- Lower lender risk. Lender municipalities often enjoy enhanced protection through property tax financing programs because property owner payment obligations are typically secured by a municipal lien that takes priority over other creditors, reducing the lender municipality's risk.[113]
- Better interest rates and longer payback periods. The lower risk of property tax financing and municipal borrowing power typically allow municipalities to offer project financing at lower interest rates and with longer repayment terms.[114]
- Transferability. With property tax financing, if a property owner sells her property before a loan is fully paid off, the new property owner assumes responsibility for the remaining payments.[115] This feature may make property tax financing more attractive for owners who intend to sell their property in the near term, and might otherwise be unwilling to make a large investment in a retrofit or other improvement.[116]
- Sustainability. Unlike rebate or other grant programs, property tax financing programs have the potential to be self-sustaining, because repayment of loans replenishes program funding.[117]
- Education. In addition to reducing cost barriers, property tax financing could address informational barriers by raising awareness, providing technical support and linking customers with qualified contractors.[118] Customers may not know about the potential energy savings associated with driving an EV, and they may not know how to install EVSE in their homes. A municipality could promote EVSE installation through its property tax financing program, streamline the installation process and connect homeowners with a list of approved contractors able to provide the installation services needed.[119]

5.2 Leader Jurisdictions

5.2.1 State of California

In California, property assessed clean energy (PACE) financing allows property owners to borrow funds to pay for energy improvements, including purchasing and installing EVSE in some municipalities. Under a PACE program, individual property owners contract directly with energy improvement providers and obtain upfront funding for the project from their local government or agency. The property owner repays the local government or agency through an assessment on her property tax bill. Typically, property owners must have a clean property title and be up-to-date on property taxes and mortgage payments.

PACE programs in California have been administered by local governments under either of two statutory frameworks: (1) energy tax assessment districts pursuant to the *Improvement Act of 1911* as amended by Assembly Bill No. 811 and (2) city charter or Senate Bill No. 555 authority pursuant to the *Mello-Roos Community Facilities Districts Act of 1982*.[120] We do not undertake a review of these enabling statutory frameworks here.

Local governments administering PACE financing programs in California can obtain support from the State pursuant to the *California Public Resources Code*. In offering such support, the intent of the Legislature is

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[112] Philip Henderson, *On-Bill Financing: Overview and Key Considerations for Program Design* (August 2012), Natural Resources Defence Council at 2, online: http://www.puc.pa.gov/Electric/pdf/Act129/OBF-NRDC_OBF_2012.pdf (discussing on-bill financing but applicable to LICs as well).

[113] Michelle Brownlee, "Financing Residential Energy Savings: Accessing Key Features of Residential Energy Retrofit Financing Programs", Sustainable Prosperity, Policy Brief (December 2013), online at: http://www.sustainableprosperity.ca/sites/default/files/publications/files/Financing%20Residential%20Energy%20Savings.pdf; Sonja Persram, *Using Local Improvement Charges to Finance Residential Energy Upgrades*, online: (25 July 2013), Sustainable Alternatives Consulting Inc. at 10 http://www.cleanairpartnership.org/files/Primer.pdf.

[114] Brownlee *supra* note 113 at 6, 11; Persram *supra* note 113 at 6; City of Toronto, Brochure, *Home Energy Loan Program*, online: (N.D.) http://www.cleanairpartnership.org/files/HELP%20e-Brochure.pdf.

[115] Persram *supra* note 113 at 5.

[116] Brownlee *supra* note 113 at 10.

[117] Brownlee *supra* note 113 at 14.

[118] Brownlee *supra* note 113 at 4.

[119] Persram *supra* note 113 at 9, 13, 14; Brownlee, *supra* note 113 at 4. Note that these reports do not discuss EVs explicitly but their arguments nonetheless apply to EVs.

[120] Joe Kaatz and Scott J. Anders, "Residential and Commercial Property Assessed Clean Energy (PACE) Financing in California Rooftop Solar Challenge Areas" (October 2014) Centre for Sustainable Energy at 8-11, online: http://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/PACE%20in%20California.pdf.

"to assist local jurisdictions in financing the installation of distributed generation renewable energy sources, electric vehicle charging infrastructure, or energy or water efficiency improvements that are permanently fixed to real property through the use of voluntary contractual assessments."[121] Table 7, below, provides examples of a few PACE financing programs in California, administered regionally by private entities.

Table 7: Summary of Select California PACE Financing Programs for EVSE

Program	Capital, Installation, or Both	Contractor Requirement	EVSE Equipment Restrictions	Caps on Funding	Other
Hero Program[122]	• both	• must be HERO-approved	• Level 2 with SAE J1772 standard charging plug • product must be certified to meet the UL subject 2594 Standard Testing for Charging stations	• HERO monitors approved contractors to ensure that costs are within the fair market value range	• the programs pay contractors directly after installation
Ygrene Works[123]	• both	• must be Ygrene-approved	• any EVSE	• dependent on property assessment and eligibility	
Sonoma County Energy Independence Program[124]	• both	• must agree to Contractor Standards and Guidelines, and supply information	• not specified – "electric vehicle plug-in station"	• to be determined	• must incorporate solar PV installation

Many North American jurisdictions, including Ontario, British Columbia and Manitoba are adopting property tax financing regimes that may be able to support EVSE installation.[125] In these cases, it may be helpful to examine a selection of California-based programs that already allow for EVSE financing, as well as the authorizing legislation in question.

6. CONCLUSIONS

Communities hoping to future-proof their building stock are fortunate that leader jurisdictions including Vancouver, California and Colorado have enacted meaningful and innovative policies to increase EVSE availability. In addition to considering the most effective options available, policymakers hoping to implement similar policies may wish to consider local technical and jurisdictional factors, which may govern the scope and form of policy implementation.

[121] California Public Resources Code, §26050(b) [emphasis added].

[122] "Hero Program", Renovate America Inc., online: https://www.heroprogram.com.

[123] "Ygrene Works", Ygrene Energy Fund Inc., online: https://ygreneworks.com.

[124] "Sonoma County Energy Independence Program", Sonoma County, online: http://sonomacountyenergy.org/.

[125] Brownlee, *supra* note 113 at 9-10.

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