

This document has been prepared as part of the implementation project of Legal Pathways to Deep Decarbonization (Michael B. Gerrard and John C. Dernbach, eds. Environmental Law Institute [2019]) (LPDD). For background information on the project, see <https://lpdd.org>

### **Memorandum to Accompany Model EV Ready Building Code Legislation**

Electrical Vehicles (“EVs”) are an efficient alternative to conventional internal combustion engine (“ICE”) vehicles and can contribute significantly to the reduction of air pollution and greenhouse gas emissions. Globally, hundreds of millions of EVs will have to be deployed in the next few decades in order to achieve an 80 percent reduction in greenhouse gas emissions from 1990 levels by 2050.<sup>1</sup> The goal is to shift 80% - 95% of the miles driven from gasoline to lower carbon energy sources like electricity and hydrogen.<sup>2</sup> Auto manufacturers recognize this trend too. General Motors, for example, forecasts that EVs will comprise around twenty percent of its vehicle sales by 2030, and up to seventy percent by 2040.<sup>3</sup>

However, a massive effort will be required to provide the charging infrastructure necessary to service such vehicles. There were 276,100,000 vehicles registered in the U.S. in 2018.<sup>4</sup> So it stands to reason that every garage or parking structure, be it residential, commercial, or industrial, being built or significantly altered should be designed and constructed so that a substantial percentage of parking spaces are EV charging ready. This is especially so because buildings and parking structures constructed today will still be in place in 30 years. There is currently a scarcity of EV charging stations as well as a public perception that underestimates the availability of existing charging options. Studies generally suggest that many people do not believe there are enough public charging stations for them to seriously consider getting a plug-in EV.<sup>5</sup> For example, one study showed that “[a]lmost 80% of people surveyed are unaware of any public charging station near them.”<sup>6</sup>

The average person commutes 26-32 miles per day.<sup>7</sup> While some studies show that 80% of current electric vehicle charging is done at home,<sup>8</sup> for those living in apartments or condominiums without charging access, public commercial chargers are equally important.<sup>9</sup> Approximately 40% of the U.S. population lives in apartments or condominiums.<sup>10</sup> Home chargers will likely always be an important charging location.<sup>11</sup> Most vehicles are parked more than 95% of the time, either

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<sup>1</sup> Amy L. Stein and Joshua P. Fershee, Legal Pathways to Deep Decarbonization in the United States, p. 353

<sup>2</sup> Id. p. 354

<sup>3</sup> Jamie L. LaReau, GM unveils 11 future EVs, new batteries and its plan to beat Tesla, DETROIT FREE PRESS, Mar. 4, 2020, <https://www.freep.com/story/money/cars/general-motors/2020/03/04/gm-unveils-10-future-evs-new-batteries-and-its-plan-beat-tesla/4905906002/>.

<sup>4</sup> <https://hedgescompany.com>

<sup>5</sup> See, 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, Final Rule, 77 Fed. Reg. 62624, 62627 (Oct 15, 2002), *available at* <https://www.gpo.gov/fdsys/pkg/FR-2012-10-15/pdf/2012-21972.pdf>

<sup>6</sup> Amy L. Stein and Joshua P. Fershee, Legal Pathways to Deep Decarbonization in the United States, p. 362

<sup>7</sup> AAA, Americans Spend an Average 17,600 Minutes Driving Each Year, <https://www.newsroom.aaa.com/2016/09/Americans-Spend-Average-17600-Minutes-Driving-Year/>.

<sup>8</sup> Accelerating Investment in Electric Vehicle Charging, Ceres, March 2018.

<sup>9</sup> Amy L. Stein and Joshua P. Fershee, Legal Pathways to Deep Decarbonization in the United States, p. 362

<sup>10</sup> Id. p. 368

<sup>11</sup> Marin County Electric Vehicle Charging Station Siting Plan, Draft Report, November 2018, page 12.

at home or work.<sup>12</sup> Workplace EV charging during the day is emerging as a particularly beneficial component of the electricity grid for renewable energy, as vehicles plugged in during the middle of the day can utilize surplus solar energy.<sup>13</sup>

Charging of an EV for 8 hours on a Level 1 charger can replenish the vehicle for about 40 miles of driving range.<sup>14</sup> A Level 2 charger can reduce charging times significantly, as it can replenish about 150 miles of range in 4 to 6 hours.<sup>15</sup> Level 3 chargers can provide a 50% to 80% charge in 20 to 30 minutes.<sup>16</sup> If EV charging stations become commonplace at home and at work, EVs will become much more attractive as people will be confident that they will be able to charge their EVs easily.

It should be noted that EV-ready charging infrastructure is significantly less expensive to install during new construction than it is for a building retrofit. One study indicates that for a parking lot with 10 total spaces and two charging stations, the estimated EV infrastructure costs amount to \$920 per charger during new construction, versus \$3,710 per charger for a retrofit, largely because of trenching, demolition, and additional permitting costs.<sup>17</sup> Therefore, preparing for the electrification of the transportation sector now with building codes that plan for the growth of the EV market will save retrofit costs.

In light of the above discussion, municipalities should consider the adoption of an EV-ready building code requirement within their jurisdictions. The proposed ordinance would require new or significantly altered commercial, industrial, or multi-family residential buildings to be equipped with the installation of Level 2 electric vehicle supply equipment in proximity to parking spaces.

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<sup>12</sup> Amy L. Stein and Joshua P. Fershee, Legal Pathways to Deep Decarbonization in the United States, p. 367.

<sup>13</sup> See id. at 372.

<sup>14</sup> For example, a Chevy Bolt gets about 4 miles of charge for every hour of Level 1 charge, suggesting a 8pm-6am charge would provide 40 miles. EnergySage, <https://www.energysage.com/electric-vehicles/charging-your-ev/charging-chevy-bolt/>.

<sup>15</sup> EVTown, Levels of Charging, <http://www.evtown.org/about-ev-town/ev-charging/charging-levels.html> (last visited Feb. 25, 2018)

<sup>16</sup> Amy L. Stein and Joshua P. Fershee, Legal Pathways to Deep Decarbonization in the United States, p. 362.

<sup>17</sup> Plug-In Electric Vehicle Infrastructure Cost-Effectiveness Report for San Francisco, November 17, 2016, <http://evchargingpros.com/wp-content/uploads/2017/04/City-of-SF-PEV-Infrastructure-Cost-Effectiveness-Report-2016.pdf>