



# Municipal EV Readiness Toolkit 12-Week Program

## Module 6: Building & Permitting

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## Transportation Electrification Plan Foundational Insights

### Why should you start planning now for a Transportation Electrification Plan?

- Connecticut passed statutes that requires a reduction of greenhouse gas (GHG) emissions 80 percent below 2001 levels by 2050 (Public Act 08-98), with an interim target of 45 percent below 2001 levels by 2030 (Public Act 18-82).
- Transportation makes up 38% of GHG emissions, the largest source of GHG emissions. In order to reach those goals, transportation will need to become zero-emission.
- For 2030 target: The [report](#) from the GC3 recommends reducing transportation emissions 29% from 2014 levels to stay on target.
- December 2015 – CT joined the [International zero emission vehicle \(ZEV\) alliance](#) that says: no later than 2050 – strive to make all new passenger vehicles in their jurisdictions ZEVs
- July 2020 – CT joined the [multi-state Medium and Heavy-duty ZEV memorandum of understanding](#) that commits states will work toward ensuring that: by 2050 – 100 percent of all new medium- and heavy-duty vehicle sales be ZEVs, with an interim target for 2030 having 30 percent ZEV sales

**Codes can be particularly effective tools to specify requirements, goals, or limits for new construction features. They can also provide new permitting or inspection protocols and encourage reduced associated administrative costs.**

Codes govern the structural aspect of EVSE installation; codes for EVSE include building and electrical codes as well as those that regulate the communications aspects of EVs and EVSE at the network scale.[1] While there are no barriers to EVSE installation embedded in the existing building and electrical codes, there are ways to encourage EV readiness.[2]

Building and electrical codes have both adopted EV make-ready policies, requiring a certain portion of parking spots to be pre-wired with electrical panels, raceway and conduit installed; the actual EVSE can be installed at a later date and the code is gearing up for PEVs to become the norm. As an example, Connecticut's 2018 State Building code, which all municipalities must follow, conforms to the 2015 International Code Council standards, requiring each individual bay of a new residential garage to have a dedicated 20 amp, 120V circuit capable for Level 1 charging (See Figure 12 for levels of charge in Appendix F). But as vehicle battery technology advances, Level 1 charging will become impractical. The State Building Inspector, State Fire Marshal, and the Codes and Standards Committee announced their intent to adopt the 2020 State Building and Fire Safety Codes based on the 2018 editions of the International Code Council standards.



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In January 2020, the International Code Council approved new voluntary code changes that would require the installation of electrical panels, outlets, and conduit (40 amp, 208/240V) accommodating Level 2 EVSE in single- and multi-unit homes. [3]

In Connecticut's current State Building Code cycle, the State Codes and Standards Committee and the Office of the State Building Inspector are considering a proposal related to EV make-ready policies. DEEP is recommending a requirement of at least 10 percent of all parking spaces in new construction of MUDs and commercial developments be pre-wired for future installations of Level 2 EV charger and to include Level 1 charging capabilities as well.[4]

PEV charging requirements are easier and more cost effective to implement with new development. It is more economical to include the conduit and wiring to accommodate PEV charging during the building phase than retrofitting later. Retrofit costs concentrate on parking lot trenching, adding electrical service and/or panel upgrades.

To address existing development, action could happen as new permits are issued for major renovations, periodic upgrades, or amenity additions. Such permits could call for EVSE and specifications for making these locations more EV-friendly.[5]

It is crucial that any codes for PEV charging stations consider the accessibility and transparency of these spaces throughout the lifetime of the equipment. Guidance documents will provide necessary specifications with how to comply with Americans with Disabilities Act (ADA) requirements. The National Institute of Standards and Technology under the U.S. Department of Commerce is creating standards for fuel sale transparency such as indicating the electrical energy, unit price, and total price of transaction.[6]

Installing EV charging stations requires approvals from local government via permits. Residents, businesses and other organizations therefore benefit from permitting processes that are efficient, timely, consistent and affordable, while ensuring safety of the installations.

The permitting process for an EV charger installation differs based on the site location, level of charger, and the number of chargers. PEV permitting requirements could be specified for each of the following:

- Single-family residential charging
- Charging and Permitting in Multi-unit Dwellings
- Workplace Charging
- Retail and Public Sector Charging
- DC Fast Charging

Connecticut worked to help streamlined the process to install an electric vehicle charging station through the creation of the Electric Vehicle Charging Station Uniform Permit Application. The form can be used for residential or commercial installations. To decrease process times, building inspectors should be educated and trained, so they fully understand EVSE.



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For some municipalities, reducing or waiving the permitting fees is a strategy to reduce the cost burden of EVSE installations. For the fee to be waived, it might be required that the EVSE either be Energy Star certified[7] or support a Connecticut EVSE company[8]. Once decisions are made about the information required for a permit application, it is a best practice to combine requirements and guidance into a one document that will guide applicants through the process.[9]

Level 1 charging outlets work for charging for long periods in home or workplace locations. It is advised that existing outlets are inspected for vehicle charging use. Level 2 charging usually requires installing the unit and some additional work. The town, via the legislative body, could offer incentives for installation of Level 2 chargers to accelerate PEV adoption for residential use.

If a location is going to have a concentration of Level 2 EVSE, it would be wise to engage the utility to see if any transformer upgrades are needed. Direct current fast chargers (DCFC) use a 480 V AC three-phase input that converts the electricity to direct current and enables rapid charging. DCFC equipment costs thousands of dollars and requires hefty electrical service upgrades. To install public DCFC, the town planning department and the utility should be advised as it requires more resources and should be deployed strategically. Permitting issues could occur that are not related to the EVSE.

Utilities have a key role to play in deploying PEV infrastructure. Many utility companies across the country offer various EV make-ready programs where the service can be upgraded to include components such as the transformer, electrical panel, wiring and conduit up to the EVSE. One EV make-ready program structure applies to either utility or privately owned and operated PEV stations. The utility infrastructure could be rate based, where the hardware is valued and permitted to earn a specified rate of return in accordance with Connecticut's Public Utilities Regulatory Authority.

[1] WXY Architecture + Urban Design and Energetics Incorporated. Creating EV-Ready Towns and Cities: A Guide to Planning and Policy Tools. New York State Energy Research and Development Authority and Transportation and Climate Initiative. November 2012.

[2] For a complete look at code-specific issues for EVSE and sample code language, please refer to the New York State Energy Research and Development Authority and Transportation and Climate Initiative guide, "Creating EV-Ready Towns and Cities: A Guide to Planning and Policy Tools".

[3] Coren, M. New US building codes will make every home ready for electric cars. Quartz. January 9, 2020. <https://qz.com/1781774/new-us-building-codes-require-plugs-for-electric-cars/>.

[4] Electric Vehicle Roadmap for Connecticut. DEEP. April 22, 2020. <https://portal.ct.gov/-/media/DEEP/air/mobile/EVConnecticut/2020-04-22--EV-Roadmap-for-Connecticut---FINAL.pdf>.

[5] Tim Taylor and Gina O'Neal, Sacramento Clean Cities, interview.

[6] Dan Shanahan, EVSE LLC., interview.

[7] Find and compare products. Energy Star. <https://www.energystar.gov/productfinder/product/certified-evse/results>.

[8] Connecticut EVSE companies include EVSE LLC., whose parent company is Control Module and JuiceBar EV Charging. This is not an exhaustive list.

[9] A sample PEV infrastructure permitting checklist can be found in Zero-Emission Vehicles in California: Community Readiness Guidebook. pp. 111. Governor's Office of Planning and Research. Fall 2013. [https://opr.ca.gov/docs/ZEV\\_Guidebook.pdf](https://opr.ca.gov/docs/ZEV_Guidebook.pdf).