Plug-In Electric Vehicle Deployment Policy Tools: Zoning, Codes, and Parking Ordinances

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State and local governments nationwide are paving the way for plug-in electric vehicles (PEVs) by allowing, incentivizing, and even requiring electric vehicle supply equipment (EVSE) infrastructure in their communities. While there is no "ideal" or one-size-fits-all deployment strategy, zoning, codes (including permitting), and parking ordinances are three particularly powerful tools to encourage PEV and EVSE adoption.

It is important to understand how zoning, codes, and parking ordinances can further the PEV readiness of communities and regions, whether implemented individually or in combination with one another. State and local jurisdictions can then assess their unique objectives and identify the best of these approaches to support PEV industry growth and innovation. Just as important, they can do so while ensuring that no individual, organization, or adjacent industry is overburdened with any requirements that are intended to facilitate the deployment of PEVs and EVSE.

Zoning

Zoning ordinances govern the use of property within a jurisdiction. In the context of PEV readiness, zoning ordinances are useful tools for state and local governments to indicate where EVSE are allowed or prohibited. Planners and other officials can also use zoning to incentivize or require EVSE throughout a municipality's zoning districts or in specific areas.

Officials can leverage zoning ordinances to formally define EVSE and ensure that installation is permissible at the state and local levels. The state of Washington (/laws/6538) offers an example of a targeted approach to siting EVSE through municipal zoning. The city of Methuen, MA (http://www.cityofmethuen.net/office-of-economic-community-development/pages/zoning-ordinance) has also adopted an addendum to a pre-existing zoning ordinance to specify permissible use of EVSE in single- and multi-family dwellings as well as commercial or industrial zones.

Alternatively, officials may choose to incentivize the installation of EVSE by providing a bonus, such as additional floor area or reduced parking requirements, in exchange for including EVSE in new construction. For example, a model municipal ordinance in Georgia includes an incentive program that would allow each designated PEV space in parking facilities to count as three spaces toward meeting off-street parking requirements.

It is important to view zoning in this context as a long-term tool, not a shortcut to accelerate infrastructure deployment. While zoning is considered a primary tool for EVSE implementation, it alone will not facilitate EVSE deployment and may even create limitations for PEV readiness in the immediate future if not assembled thoughtfully. Zoning ordinances must include clear definitions and provisions to avoid unintended limitations on EVSE deployment. New York City's (http://www.nyc.gov/html/dcp/html/zone/glossary.shtml) Department of City Planning demonstrated this best practice when it amended zoning language to define EVSE in conjunction with parking facilities as an accessory use. This action allowed EVSE to be located in any drive-in property in a commercial district, rather than only at existing fueling station locations.

Similarly, when employing zoning ordinances, it is important to consider existing technology while thinking ahead to future technology and installation scenarios. For example, Level 1 and 2 EVSE have their own particular zoning implications; but DC fast charging, which is useful in roadside or commercial applications, is also available and requires different zoning considerations. Officials should also be aware of the potential for current zoning to prohibit or preclude EVSE and should review local ordinances to ensure that EVSE is permitted under existing regulations.

Codes

Codes and standards are intended to work in combination to create a framework of safety requirements and best practices. While there are numerous aspects of PEV readiness standardized by codes, the most common are model codes for the construction and electrical equipment installation procedures associated with EVSE.

In the United States, codes and standards are developed at the national level and typically reference consensus standards developed by standards-developing organizations. The two key bodies (and relevant codes) that govern EVSE installation and inspection are:

- National Fire Protection Association (http://www.nfpa.org/) (NFPA)
  - National Electrical Code (http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=70) (NEC)
- International Code Council (http://www.iccsafe.org/) (ICC)
  - International Building Code (http://www.iccsafe.org/codes-tech-support/codes/2015-i-codes/ibc/) (IBC)
  - International Residential Code (http://www.iccsafe.org/codes-tech-support/codes/2015-i-codes/irc/) (IRC)

For an overview of current PEV and EVSE-related codes and standards, see the National Renewable Energy Laboratory's Electric Vehicle and Infrastructure Codes and Standards Citations (/pdfs/48605.pdf) and Electric Vehicle and Infrastructure Codes and Standards Chart (/pdfs/48604.pdf).

States and local jurisdictions may adopt model codes either in their entirety or with amendments through the legislative or regulatory process. Codes are generally revised at the national level every three years to reflect new safety concerns and technologies. For this reason it is important to not reference a particular version of a code in state or local laws, as the citation will need to be updated more regularly. Adopting authorities, policies, and procedures differ greatly among states and jurisdictions, although regulation typically requires action at multiple levels and occurs every three to six years.

Codes can be particularly effective tools to specify requirements, goals, or limits for new construction features (e.g., percentage of required parking spaces to be built EVSE-ready). They can also provide new permitting or inspection protocols and encourage reduced associated administrative costs. While codes can influence markets to some extent, they are not direct predictors of the future of EVSE infrastructure in a jurisdiction. Additional examples of how codes can be used to further community PEV readiness include:

- **EVSE-Ready Requirements:** State and local jurisdictions can include mandatory minimum requirements for future EVSE installation as a relatively simple, low-cost solution to address the complexities of achieving PEV readiness. PEV-ready requirements may include EVSE installation, pre-wiring, or space reservation. California (/laws/11068) building codes, for example, require EVSE infrastructure at new multi-family dwellings and non-residential developments. Similarly, newly constructed buildings in Oakland, CA (/laws/local_examples#9) must provide for EVSE charging, and developers in Palo Alto, CA must provide EVSE charging infrastructure in all new detached single-family dwellings (https://www.cityofpaloalto.org/civicax/filebank/documents/39791) and new multi-family residential and non-residential construction (https://www.cityofpaloalto.org/civicax/filebank/documents/42838). New York City (http://legistar.council.nyc.gov/Legislation.aspx) also requires that newly constructed and upgraded parking garages and open lots include the necessary hardware for EVSE in at least 20% of the parking spaces.

- **Expedited Permitting & Inspection:** Codes can encourage PEV deployment by removing barriers to residential EVSE installation. States such as Oregon have used codes to establish a flat, consistent fee for residential EVSE installation. Other jurisdictions, like Houston, TX and Los Angeles, CA, have used codes to streamline the permitting and installation processes. While most expediting efforts have focused on single-family home installations to date, there is significant opportunity for future codes to facilitate more complex installations in multi-family and commercial settings.

- **Local Customization:** It is important to factor local conditions into the decision to use codes to regulate for EVSE. States can encourage local PEV readiness by offering a menu of options that are standardized at the state level but adopted on a voluntary basis at the local level. California (/laws/11068) and Oregon (/laws/11065) have both taken this approach to EVSE-related standards.

Parking Ordinances

Parking ordinances apply to publicly accessible EVSE, whether at municipal lots, privately operated garages, or on-street locations. Officials can leverage parking ordinances to address a number of aspects of PEV charging infrastructure. Examples include the scope of EVSE pre-wiring or installation from a transportation and logistics perspective, on-street EPV charging and parking, EVSE user rotation, access, and violations.

Parking ordinances can encourage PEV deployment by providing direct parking incentives or providing access to charging in high-density areas. Hawaii (/laws/9403) provides one example of direct parking incentives, and Philadelphia, PA (https://phila.legistar.com/) (Section 12-1131 of the Philadelphia Code) demonstrates a municipal parking ordinance that provides EVSE access.

Parking ordinances may also foster PEV readiness by establishing EVSE requirements at the state and local levels. Examples include:

- Hawaii (/laws/6566)
- California (/laws/9579)
- Local governments in Washington (/laws/6538)
- Kansas City, MO (/laws/local_examples#9)
- Raleigh, NC (https://library.municode.com/nc/raleigh/codes/code_of_ordinances?nodeId=DIVIICOGEOR_PT11TR_CH2MOVETR_ARTJPAST_S11-2177STLOON)

Additionally, parking ordinances are important tools to manage public enforcement on both public property and private property that offer EVSE charging and parking to the public. Parking regulation and enforcement is typically a shared responsibility in municipalities. It often requires participation from departments of transportation, law enforcement, public works, permitting, parking lot and garage managers, and other key players in the management of transportation and traffic. Parking ordinances can establish a clear process that determines which of these players will handle various logistics of PEV parking spaces in the public realm. For example, the city of Raleigh, NC (https://library.municode.com/nc/raleigh/codes/code_of_ordinances?

nodeId=DIVIICOGEOR_PT11TR_CH2MOVETR_ARTJPAST_S11-2177STLOON) authorizes privately employed parking staff to enforce parking violations related to PEV spaces. If parking staff do not impose the appropriate fine, the police may also step in to provide enforcement.

For more information about zoning, codes, and parking ordinances as they relate to PEV readiness and EVSE deployment, refer to the Alternative Fuels Data Center Laws and Incentives (/laws) website. Additional resources include:

- National Institute of Standards and Technology (NIST) Handbook 130 Method of Sale for Electrical Energy as Vehicle Fuel (http://www.nist.gov/pml/wmd/usnwg-evfs.cfm)
- NIST Handbook 44 Device Code Requirements for Electric Vehicle Fueling and Sub-Metering (http://www.nist.gov/pml/wmd/usnwg-evfs.cfm)
- American National Standards Institute (ANSI) Standardization Roadmap for Electric Vehicles Version 2.0 (http://www.ansi.org/news_publications/news_story.aspx?menuid=7&articleid=3618)
- Transportation Climate Initiative (TCI) "Creating EV-Ready Towns and Cities: A Guide to Planning and Policy Tools (http://www.transportationandclimate.org/creating-ev-ready-towns-and-cities-guide-planning-and-policy-tools)"
- TCI EV-Ready Codes for the Built Environment (http://www.transportationandclimate.org/ev-ready-codes-built-environment)
- TCI A Guide to the Lessons Learned from the Clean Cities Community Electric Vehicle Readiness Projects (/uploads/publication/guide_ev_projects.pdf)