

Appendix 1: Annotated Pennsylvania Model Ordinance

Much of the structure and content of these notes are inspired by the Great Plains Institute's Summary of Best Practices in Electric Vehicle Ordinances by Claire Cooke and Brian Ross, 2019, and a literature review of over 20 ordinances and model ordinances (Cook, C., Ross, B. 2019.)

1. Electric Vehicle Charging Station as Permitted Land Use
 - a. Restrictions on charging stations in the right of way
 - b. Levels 1-3 EVSE allowed in all zones when accessory to the primary permitted use
 - c. EV Charging as primary use
 - i. Considered a motor fuel station for zoning purpose
 - ii. Permit EV charging stations as primary use in all zoning districts where motor fuel stations are permitted

This section details where EV charging infrastructure is permitted. Ordinances explain where these land uses are permitted to ease the installation of infrastructure that serves the public. While charging stations are mostly an accessory use, they (especially DC fast chargers) may be a primary use in some instances.

Some ordinances allow only levels 1-2 EVSE in all zones.

2. New Single and Two-Family Dwellings Parking Minimums
 - a. Min Level 2 EVSE or make-ready spaces
 - b. A minimum of 1 make-ready parking spot provided per single or two-family dwelling
 - c. If a garage is constructed
 - i. Make-ready spots must be in the garage
 - d. If no garage is built
 - i. Make-ready spot must be provided in a nearby parking spot
 - ii. 5% of total parking spaces must be EVSE
 - iii. 25% of total parking spaces must be Make-ready
 - iv. 10% of EVSE and Make-ready spaces must be disability accessible
 - e. EVSE spaces must include signage

According to Consumer Reports, 71% of consumers say they would do most of their charging at home and EV owners with 250 miles of range can do 92% of their charging at home if they have a garage or parking space with EVSE. As most Pennsylvanians live in single or two-family dwellings, this ordinance provides for EVSE and make-ready spaces in new construction of these dwellings to capture savings by avoiding future costly retrofits to install chargers (2020a) (Preston, 2020b)

Level 2 charging should be the minimum standard for all EVSE and MR spaces considering its superior charging speed over level 1.

Level 1 charges 3-5 miles per hour

Level 2 charges 12-80 miles per hour

Level 3 charges 3-20 miles per minute but can be cost prohibitive in all but commercial uses

For most 1-2 family dwellings without garages, these spaces will be driveways with adjacent outlets.

According to the International Council on Clean Transportation, 2.4% of US light-duty vehicle sales in 2020 were EVs. According to Ford, Bloomberg Research, and the Fuels Institute, by 2030 20-40% of light-duty vehicle sales will be EVs. After 2030 that percentage will continue to increase. While the lag effect of market sales to vehicles on the road is important to remember, these percentages recognize that as of 2022 EVs are not widespread but that their adoption is imminent and extremely aggressive. The reviewed ordinances that include EVSE/MR parking minimums usually provide for a single digit's percentage of initial EVSE with 20-15% of the remaining spaces MR.

According to the CDC, 12% of Pennsylvanians have mobility-related disabilities (CDC, 2022). As these spaces are not reserved for disabled individuals, it is highly recommended to maintain a relatively high percentage of EVSE spaces accessible.

3. New Multi-family dwellings Parking Minimums

- a. Min Level 2 EVSE or make-ready
- b. 5% of total spaces must be EVSE
- c. 25% of total spaces must be make-ready
- d. 10% of EVSE and make-ready spaces must be disability accessible
 - i. If any EVSE are required, a minimum of one space must be accessible to individuals with disabilities
- e. EVSE spaces must include signage

Individuals living in multi-family dwellings face a unique charging challenge. It is significantly more difficult for residents of multi-family dwellings to install and access charging infrastructure unless it is installed at construction. According to Consumer Reports, residents of apartment buildings are more likely to say they would have to rely on public DC charging stations (2020a) (Preston, 2020b).

4. New Parking Lots and Garages, Commercial, Office, Industrial, Public, Parks and Recreation and other Parking Minimums

- a. Min Level 2 EVSE and make-ready
- b. EVSE spots must include signage
- c. Businesses with 25 or fewer spaces are not required to install Make-ready or EVSE
- d. 5% of total parking spaces must be EVSE
- e. 10% of total parking spaces must be made ready

According to the Fuels Institute, nonavailability of chargers at home and making trips longer than the battery range are the two main reasons why drivers use public EVSE. The most popular public chargers are those where vehicles are typically parked for longer periods, including airport parking, grocery stores, dining, and shopping. EV consumers expect to spend 60

or fewer minutes at public EVSE (Fuels Institute, 2021). Provisions that ease burdens on businesses with fewer than 25 spaces lessen the cost and logistical burden on smaller businesses.

The lower make-ready percentage reflects the stronger consumer preference for home charging.

5. New Development and Construction Minimum Parking Requirements

- a. EVSE and make-ready parking spaces are always counted towards any parking minimum requirements
 - i. If a variance has been granted that impacts parking requirements, all requirements apply to the variance parking number
- b. Each EVSE and make-ready parking space of level 2 or greater count as 2 parking spaces for regular parking minimums, up to a 10% reduction in total parking
- c. EVSE and make-ready installation requirements are always rounded up to the next full number unless the required number is already a full number
- d. New mixed-use sites with off-street parking are required to install EVSE and MR at the rate required by their individual uses or portion of the total parking spaces
- e. Public entities are not exempt from EVSE and make-ready requirements

EVSE and MR parking requirements should be clear and specific to avoid confusion and delay.

Some ordinances include these provisions that maintain fairness in calculating parking minimums, ease cost burdens and include an incentive to create more EVSE and MR spaces.

Many ordinances do not include public entities install EVSE and MR. This eases burdens on public entities. However, consumers benefit from uniform and standardized access to EVSE as a public good.

6. New and Existing EVSE Equipment Standards

- a. EVSE must be mounted
 - i. Outlets and connector devices 36-48 inches from surface where mounted
 - ii. Equipment mounted shall not impede pedestrian travel or create trip hazards within right of way
 - iii. Retractable cords or place to hang above pedestrian surface, do not cross driveway, sidewalk, unloading area
- b. EVSE Protection: EVSE must either be:
 - i. EVSE equipment minimum 24 inches from curb OR
 - ii. EVSE must be protected by wheel stops or concrete filled bollards
- c. EVSE Parking space design
 - i. Parking spaces size must not be different from normal parking space standards

The minimum standards and required design of EVSE encourages standardization and protects consumers from poorly designed and constructed infrastructure. These specific requirements are commonplace in ordinances.

Specific fines and provisions should be specified at the local level.

This maintenance provision protects the public and governments from private 'stranded assets' that are no longer functional and become blighted.

7. Signage and Road Marking Requirements
 - a. Each EVSE space must include signage showing reserved for EV via usage of green paint for parking paint and/or signage
 - b. Wayfinding signs effectively guide motorists. Regulatory signage must not interfere with parking spaces, drive lane or exit
 - c. Required EVSE informational signage
 - i. A contact number shall be provided on each EVSE signage space to report EVSE safety and equipment issues
 - ii. Voltage and Amperage information
 - iii. Charging and Parking fees
 1. This ordinance does not restrict fees collected for EVSE charging or parking
 - iv. Hours of operation and time limits (if applicable)
 - v. Safety information related to charging
 - vi. Restrictions, fines, and towing provisions
 - d. Lighting and Landscaping Requirements
 - i. Lighting shall be provided in accordance with municipal parking rules unless charging is during daytime hours only
 - e. EVSE functionality
 - i. EVSE shall be maintained in all respects including the functioning of charging equipment and must be operational during business hours of use

Ordinances have considerable variation in the specific building and electrification requirements they impose. These requirements ensure that level 2 EVSE and MR spaces are properly electrified and ensure parking structures are properly designed for future EVSE conversions.

8. EVSE and MR Building Standards
 - a. Require MR and EVSE have 208/240V and 40A per space with dedicated branch circuit and overcurrent protection device per space
 - b. Require all parking spaces in a structure be made EV capable- i.e., conduit be installed throughout structure and subpanels sized to accommodate 60A or 40A breakers for each

Local governments are empowered to enforce publicly accessible EVSE parking restrictions. If these restrictions are not enforced, the public good will be reduced and these investments can be wasted.

9. New and Existing EVSE Parking restrictions and enforcement
 - a. Local governments and their authorized authorities will enforce EVSE restrictions and are empowered to fine and towing violators

- b. EVSE disability accessible spaces shall not be signed or enforced as disability access only
 - c. Parking Ordinance
 - i. When a sign provides notice that a parking space is a publicly designated electric vehicle charging station, no person shall park or stand any non-electric vehicle in a designated electric vehicle charging station space.
 - ii. Further, no person shall park or stand an electric vehicle in a publicly designated electric vehicle charging station space when not electrically charging or parked beyond the days and hours designated on the regulatory signs posted.
 - iii. For purposes of this subsection, “charging,” means an electric vehicle is parked at an electric vehicle charging station and is connected to the charging station equipment.
 - iv. The parking enforcement officer or police department is authorized to cite and/or remove or cause the removal of vehicles parked in violation of this section.
10. Defining terms: at least these terms will need to be defined:
- a. Accessible electric vehicle charging station
 - b. Battery charging station
 - c. Battery Electric Vehicle
 - d. Battery exchange station
 - e. Charging Levels
 - i. Level 1
 - ii. Level 2
 - iii. Level 3
 - f. Electric Vehicle Charging Station
 - g. Electric Vehicle
 - h. Electric Vehicle, Plug-in Hybrid
 - i. Electric vehicle charging station- private restricted use
 - j. Electric vehicle charging station- public use
 - k. Electric vehicle supply equipment
 - l. Electric vehicle infrastructure
 - m. Electric vehicle parking space
 - n. Non-electric vehicle
 - o. Rapid charging station
 - p. Make-Ready Parking Space (MR)
 - q. New Multi-family dwellings Parking Minimums
 - i. 3 or more residential units