

Electric Vehicle charging for your multi-family dwelling



Overview

Multi-family housing (MFH), including town homes, apartments and condominiums often have unique issues associated with EV charging installations. The following information will help orient potential installers and users to these issues and provide guidance on recommended practices.

Drive Electric Vermont (DEV) has a general resource on plug-in electric vehicle (EV) charging technology which is a good place to learn about EV charging and related issues:

<http://driveelectricvt.com/for-businesses>

DEV's EV Charging Installation Guide has more detailed information on siting considerations, including recommendations to ensure charging is accessible for disabled EV owners:

<http://www.driveelectricvt.com/charging-stations/installation-guide>



EV charging at Burlington Co-housing East Village Community

EV Charging Installation Considerations

- 1. Location** – If MFH residents have assigned parking spaces and own their residence then it is usually simplest to install charging in those spots. This is usually done at the owner's expense, although grants or incentives may be available to offset the cost. If parking spaces are not assigned or occupants are renters, then MFH owners should look to minimize the distance from existing electric service connections to a charging spot to reduce installation costs.
- 2. Type of Charging** – Level 2 (208/240V AC) is the most common variety of public charging infrastructure and uses a standardized connector for all EVs except Tesla, which has an adapter available. On a Level 2 charger, a vehicle takes about 4-6 hours to reach full battery charge, which makes it ideal for overnight home charging. Level 1 charging is simply plugging into a standard 120V receptacle. It takes much longer and is less efficient than Level 2, but could be worth considering in some cases, especially if there are existing receptacles available near where residents park.
- 3. Number of Charging Ports** – Charging equipment vendors have various models available, many of which have "dual-port" configurations with the ability to charge two EVs at once from one piece of equipment. Single port equipment can be a good, low cost solution for parking spaces dedicated to individual residents. For shared or public use, providing a minimum of two charging ports is recommended. When installing new charging, a best practice is to place additional electrical conduit to streamline future expansion of EV charging as demand warrants.

4. **Cord Management** – Equipment manufacturers have developed various ways to manage the cord running from the charging equipment to the vehicle charging port. Keeping cords off the ground will reduce maintenance issues, simplify snow removal, and provide a more pleasant experience for users. Cords should not stretch across pedestrian walkways when in use.
5. **Signage** – Shared or public EV charging parking spaces should be signed. We recommend regulatory signs indicating no parking “except electric vehicle charging”. For public EV spaces, special time or other restrictions could be shown, for example “residents only from 8 PM to 9 AM.”

Dual Port ChargePoint Level 2 networked EV charger



EV Charging Cost Considerations

1. **Capital Costs** – Level 2 charging requires purchasing EV charging equipment. The equipment cost varies depending on monitoring and metering capabilities and/or the ability to collect payment for charging sessions. Basic single-port Level 2 chargers suitable for MFH use are available starting around \$600, with more advanced dual-port networked equipment costing up to \$7,000 or more. Many electric utilities offer incentives for Level 2 charging purchases.

Installation costs will vary significantly depending on proximity to existing power connections, capacity of existing electric service, and type of unit installed. A typical home installation may cost \$500-1,000, but it is possible some MFH locations could cost \$10,000 or more, depending on whether upgrades are needed to the existing electrical service and other factors. Getting an estimate from a licensed electrician is recommended to better understand cost.

Use of wall mounted equipment is generally less expensive than pedestal or bollard style units due to reduced installation costs, as there is no need for a concrete pedestal mount.

2. **Charging Equipment Subscription Costs** – Networked charging equipment that can collect payments often requires an annual or monthly fee to a service provider offering connected monitoring and payment services using cellular data service or a Wi-Fi connection. Depending on the vendor, this might add another \$120-400 per port in annual operating expense for this capability.

Summary of Capital and Non-Electricity Costs with Example Equipment Models

Type	Costs (excluding installation)	Example Vendors
Non-internet connected	Hardware: \$500-\$700 Subscription: N/A	Clipper Creek ruggedized models
Internet Wi-Fi connected, 3 rd party payment & reservation	Hardware: \$800-\$2,000 Subscription: \$10-25 per month	Enel X with Juicebox EV Match AmpUp
Cellular networked commercial charger	Hardware: \$4,000-\$7,500 Subscription: \$20-\$40 per month per port	ChargePoint CT 4000 family Flo Commercial EV Box

- 3. Electricity Costs** – Ongoing operating costs also depend on the amount of use the charging stations receive. Individual models of EVs can charge at different rates, typically ranging from 3-7 kW for Level 2 charging. An average all-electric EV driver that charges at home 85% of the time will use about 250 kWh per month. That adds up to around \$50/month in electric costs for power based on Vermont's average electric rate of \$0.19/kWh. If the charger is also accessible to the public, roughly another 125 kWh per month, or about 30 hours of active use, costing another \$25/month is possible although public use is highly variable.

Depending on your MFH property's level of electric use and rate structure, it may be subject to peak demand charges which could add additional costs to your electric bill if EV charging activity overlaps with peak periods.

Setting Fees to Cover Costs

MFH owners have a few options to assess fees on EV charging activity to cover their costs:

- 1. Resident meter** – If EV owners have their own charging equipment tied into their meters, covering costs is a non-issue - they will pay for their own electricity like usual.
- 2. Pass-through** – If residents have their own dedicated space and charging equipment, but it is connected to a shared meter, then charging equipment is available that will allow them to report on how much energy is used and this could be added to their HOA or tenant fees.
- 3. Flat rate** – EV charging could be offered to residents as an amenity, either to all residents, similar to a fitness center, or to residents who opt in for a flat rate. In this case the charging equipment should be limited to resident use only.
- 4. Cost to charge** – As described above, there is charging equipment available that can automatically collect a fee, which can then be deposited into an account for the homeowners' association (HOA) or management company. Property owners may want to factor in electricity costs, network subscription fees, payment processing costs, and/or extended warranties to ensure all operating costs associated with the charging equipment are covered.

In addition to operating costs, the cost of installing a charging station can also be shared with residents. In the case of a resident-owned charger, the resident is typically responsible for installation costs. In cases where upgrades are needed to the building electrical panel or in the case of a community charger, these costs could be shared across the residents through an HOA fee or through a dedicated fundraising effort.

Incentives

Many electric utilities in Vermont are offering incentives for EV chargers, typically in the range of \$500 per port, and publicly accessible chargers might be eligible for additional incentives. Contact your local utility for more information.

Federal tax credits are also available for EV chargers, but currently expire at the end of 2021. Businesses, including property managers, may be eligible for 30% off, up to \$30,000, the purchase and installation of EV charging stations. For individuals, the tax credit is 30% off, up to \$1,000.

Additional Resources

The Drive Electric Vermont team is available to respond to questions and help you get started:
<https://www.driveelectricvt.com/contact-us>

The US Dept of Energy has EV charging resources for multi-unit dwelling residents:
https://afdc.energy.gov/fuels/electricity_charging_multi.html

A few Vermont utilities have pilot programs with EV Match, a charging equipment provider that offers low cost solutions for access-controlled charging and fee collection appropriate for MFH locations:
<https://www.evmatch.com/>

Other companies that provide services for charging are ChargePoint, EV Safe Charge, and SemaConnect:

- ChargePoint: <https://www.chargepoint.com/blog/ev-charging-condos-get-your-hoa-say-yes/>
- EV Safe Charge: <https://evsafecharge.com/ev-charging-for-apartments/>
- SemaConnect: <https://semaconnect.com/applications/apartments-and-condos/>

A few cities have developed case studies for MFH that explore common barriers and solutions:

- Smart Columbus Case Study
<https://d2rfd3nxvhnf29.cloudfront.net/legacy/uploadedfiles/playbook-assets/electric-vehicle-charging/mud-case-study-final.pdf>
- Plug In San Diego EV Charging
https://www.sandag.org/uploads/projectid/projectid_511_25855.pdf
- Seattle City Light Guide https://energysolutions.seattle.gov/wp-content/uploads/Electric_Vehicle_Service_Equipment_for_Multi.pdf



EV Match enabled level 2 charging at Burlington Electric Department pilot location - 316 Flynn Ave mixed use development

