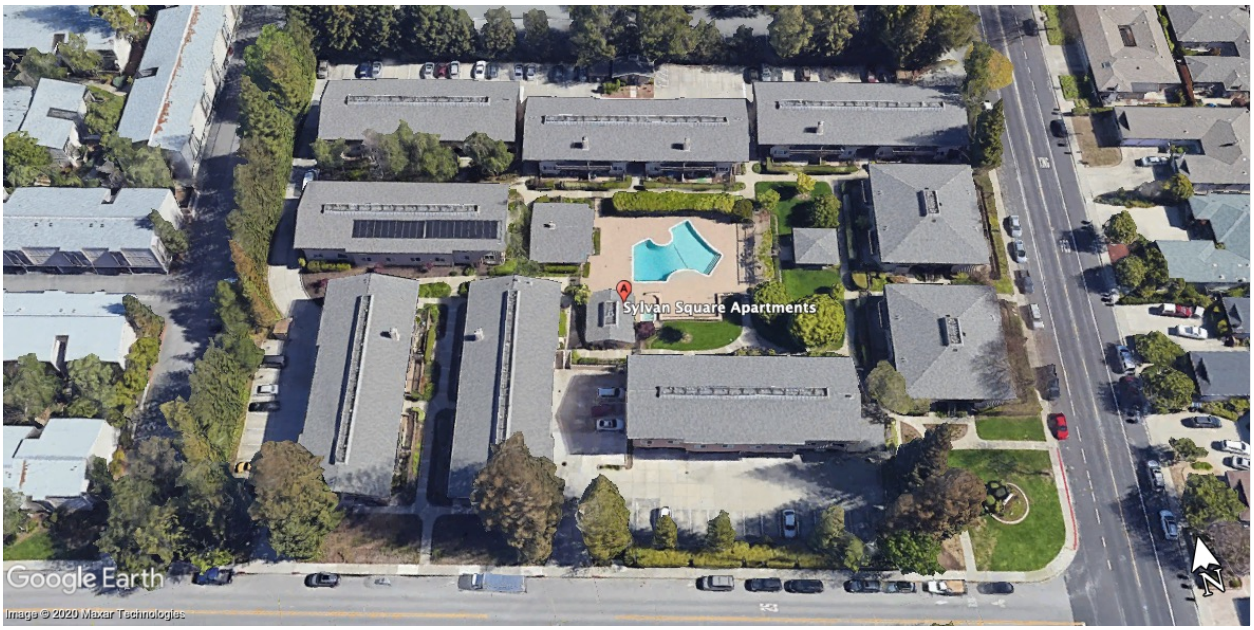
## Case Study 2: Sylvan Square Apartments, Mountain View

Sylvan Square Apartments is a 72-unit, garden-style property in Mountain View, CA operated by Prodesse Property Group. Units are below market rate for the area and may be considered naturally occurring affordable housing. [13] Each unit has access to one assigned covered parking space and free shared parking for second vehicles and guests.




### Management's Operational Preferences for EV Charging

At the time of site recruitment for the pilot, the community manager at Sylvan Square reported that three residents drove EVs or plug-in hybrids, and that current and potential residents had inquired about EV charging. Resident EV owners were using 120-v outlets on the ceilings of their assigned parking stalls for charging, and the management had sent letters to these residents prohibiting the practice. Tenant EV charging in common area outlets presented two problems for the management:

- Power from the 120-v outlets was supplied through the property's common electrical meter, not the residents' individual utility meters. The property operator did not want to supply free electricity for EV charging.
- These 120-v outlets were on the same circuit branch as the covered parking lights; if more than one renter used the 120 v outlets on the same circuit to charge and site lights are on, the circuit could be tripped and the lights might turn off, creating a safety problem and electrical code violation. [14]

The owner of Sylvan Square participated in the pilot in order to serve current and future renters by providing convenient on-site EV charging options while recouping the cost of electricity. The management's preferences for an EV charging solution were as follows:

- Locate the new assigned chargers in parking spaces that were previously shared and available on a first-come,

[13] "Naturally occurring affordable housing," as defined here, refers to a rental units with a monthly cost of no more than 30% of the area median income (AMI).

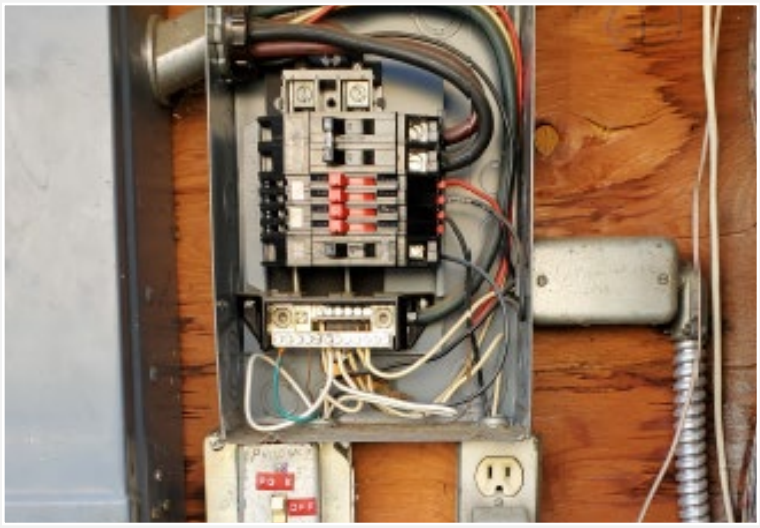
[14] EVSEs are designated by the National Electric Code as providing a "dedicated continuous load." Overcurrent protection in NEC 220.87 (2) requires that 125% of the load be available on the circuit breaker. If site lights and receptacles (120-v outlets) are on the same 15-amp circuit breaker, EV charging at 12 amps together with a lighting load of more than 3 amps will overload the circuit and trip the breaker. If two residents tried to charge their EVs by plugging into 120-v outlets on the same circuit branch, the circuit would also overload and trip the breaker.

first-served basis.

- Rent the new electrified spaces as secondary assigned spaces, billing the resident a monthly amount that reflects the value of the amenity of access to the second assigned parking space while also reimbursing the owner for the projected cost of electricity and network fees.
- Avoid becoming involved in parking management issues related to shared EV charging stations.
- Comply with the city of Mountain View's rent control board requirements associated with charging residents additional rent for an EV parking space. The city of Mountain View requires a joint petition filed by either the tenant or the multi-family property manager in order to make any adjustments to the rental rate being charged for parking not currently listed in the existing housing rental agreement. [15]
- Minimize recurring costs and maintenance, including annual CDFA fees [16] that may be charged to property owners when metering and selling electricity through EVSE.

## Evaluation of House Electrical Panel Capacity

A seven-day load study of the existing single-phase 100-amp house sub-panel was conducted with a Dent power meter. The study found that there was sufficient power at the sub-panel to supply up to six L1 EVSE. However, because the existing electrical sub-panel was installed in 1968 and did not have the physical space to support additional circuit breakers, a panel upgrade was required. The limiting factor in the size of the sub-panel upgrade was the size of the #2 AWG conductor wire supplying power to the sub-panel. Upsizing the #2 AWG wire and the conduit running under the parking lot would have been prohibitively expensive.



The existing 125-amp, single-phase electrical sub-panel at Sylvan Square Apartments, had no space for additional circuit breakers for EV charging.

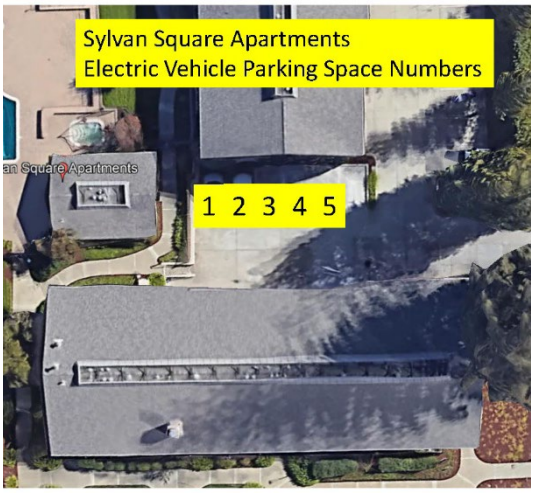
[15] March 2021 City of Mountain View Rental Housing Committee Resolution. Chapter 6: Upward Adjustment Regulations, Item G, Joint Petition for New and Additional Services:

> 1. Joint Petition Process. The procedures set forth in this Section G create an expedited review of Joint Petitions for New and Additional Housing Services, by which approval for an increase in Rent or a one-time payment between Tenant(s) and Landlord(s) may occur. The Joint Petition for New and Additional Housing Services may be used to request an increase in Rent or a one-time payment to recover costs associated with the following: a. New or additional Housing Services that are not included in the written Rental Housing Agreement; including new or additional pets, additional parking, or storage spaces.

[16] See the "Policy and Program Barriers" section for details of California Department of Food and Agriculture Weights and Measures regulations.

## Sylvan Square Low-Power EV Charging Solution

Five 16-amp (1.92-kW) Plugzio charging units were installed at Sylvan Square Apartments by Low Power EV Charging, Inc. The location of the house electrical sub-panel, adjacent to a wall with six parking spaces, was the ideal demonstration of a low-cost installation where conduit and smart outlets could be attached to a wall, avoiding $4,320 in additional labor costs that would have been required for burying conduit and installing pedestals. Although there were a total of six parking spaces adjacent to the house sub-panel, there was no wall adjacent to the sixth space. To avoid the extra labor cost of trenching through the concrete sidewalk and installing a post to mount a Plugzio unit, the sixth parking space was left open to allow for future conversion to an ADA van accessible space. Should the property owner decide to convert EV charging units from assigned to shared (common use) resident EV charging, the California Building Code requires that one of the EV charging stations be ADA van accessible, which will entail striping the sixth adjacent parking space. [17] The property owner chose to be reimbursed for electricity and cellular-networking fees by collecting an additional $95 monthly fee along with the residents' rent, via a parking lease agreement. The management reasoned that a second dedicated parking space, even if not electrified, was a desired amenity on the densely populated property, and that rental of additional parking spaces was already normalized in the multi-family rental market.




*Conceptual proposal for L1 EV charging. Established cypress and vegetation were removed to facilitate access.*

[17] See the "Policy and Program Barriers" section for more information on ADA requirements for shared EV charging.

*Plugzio outlets at Sylvan Square Apartments installed by Low Power EV Charging.*

| Sylvan Square EV Charging Installation Costs | |
|---|---|
| **Electrical Permit Fee, City of Mountain View** | $86.00 |
| **Installation of New 100-amp Sub-Panel** | $1,485.00 |
| **Labor and Materials, Make-Ready and Overhead** | $10,601.93 |
| **Plugzio Networked Charging Units** *($800 each)* | $4,000 |
| Cellular and Software Fees | Included for 2 years in the cost of each Plugzio unit. Afterwards, $9/month per Plugzio unit. |
| Parking Signage | No signage required as Plugzio units are assigned to residents by unit and parking space number. |
| **TOTAL PROJECT COST** | $16,172.93 |
| **Cost per EV Charging Port** | $3,234.59 |
| Property Owner Cost-Share *(paid for required panel upgrade)* | 7% |
| Cost of EV Charging for Residents *(paid to management with monthly rent)* | $95/month |

## Key Lessons of the Sylvan Square Pilot Site [18]

- The grant offered the property owner a total cap of $15,000, or $3,000 per port, paid directly to Ecology Action's direct-installation contractor, Low Power EV Charging. The owners of this market-rate property were willing to pay a small cost-share of less than 10% directly to our program contractor to make up the difference in cost.
- Electrical panel upgrades will most likely be required to make EV charging possible at older multi-family properties. The electrical-panel upgrade increased the cost of this installation by approximately $1,500 and was covered primarily by the cost-share. Without this upgrade, the cost per EV charging port at Sylvan Square would have been $2,938/unit, instead of the actual $3,235/unit.
- Encouraging tenants to opt into paying for EV charging can be a problem when tenants are accustomed to free electricity for charging. Three Sylvan Square residents were EV owners at the time of the Plugzio installation. Four months after installation, one resident EV owner had moved and one EV owner continued to charge for free by plugging into a common area 120-v outlet/light fixture near their assigned parking spot, even though this was prohibited by the management (see reasons on page 13, above). After door-to-door community canvassing and emailing these residents sign-up instructions for Plugzio, the two resident EV owners at Sylvan Square did not request assignment to EV charging parking spaces, possibly because they did not want to pay the $95/month fee set by the property operator when they could charge for free. The management plans to evaluate and analyze real data from EV usage and restructure their pricing model if the data are compelling to do so.

*Plugzio outlets at Sylvan Square Apartments installed by Low Power EV Charging.*



[18] See the "Key Lessons" section for a more detailed discussion.