



Serving the San Mateo County Community

Commuter & Multifamily EV Charging Level Needs Analysis:

Level 1 or Power-Managed Level 2 Charging at 1.65 kW Meets the Daily Needs of 94+% of Drivers

Executive Summary

The study, 'Commuter & Multifamily EV Charging Level Needs Analysis', analyzes the charging levels required for residents in multifamily buildings. By understanding the charging needs required by multifamily residents, charging solutions can be designed to be more cost-efficient and to provide charging to as many residents as possible.

The study uses the Census Bureau's ACS dataset for Public Use Microdata Areas (PUMA) for San Mateo County, Santa Clara County, and Fresno County, which reports an individual's dwelling type and self-reported commutes, representing real commute patterns of the entire population, including individuals with low, average, and high commute distances. The study analyzes groups of 3-5 vehicles with mixed commute patterns sharing 6.6 kW (standard 40A circuit) of charging capacity via a power-managed Level 2 charging system.¹ A vehicle efficiency of 3.5 kWh per mile is assumed for all scenarios.

The key takeaways are summarized below as average across the three counties studied:

Power Mgmt. Level, Vehicles per Level 2, 40A of Power	Percent of drivers' commutes satisfied	Charging Level
3 vehicles	98.8%	2.2 kW, 77-92 miles of range per night
4 vehicles	94.1%	1.65 kW, 58-69 miles of range per night)
5 vehicles	73.5%	1.32 kW, 46-55 miles of range per night

The results suggest that providing a minimum of 1.65 kW per car will satisfy nearly all commute needs. The 5.9% of individuals whose needs are not met are those with the longest commutes. While the study tested various locations, commute patterns will vary.

Implications for Charging Infrastructure Deployment

As the results show, a 1.65 kW charging solution will cover nearly all commute needs. Power managed Level 2 or Level 1, which can provide up to 1.9 kW at 16A, are technological charging solutions that fit this minimum power delivery requirement at the lowest cost compared to a traditional 32A Level 2 station powered by a single 40A circuit. A traditional Level 2 port may cost between \$8,000 to \$12,000 installed whereas a power managed Level 2 port may cost as low as \$3,600 and a Level 1 outlet costs even less, around \$1,800². Utilizing these technologies also allows sites to install more chargers than otherwise would be possible through energy management.

A non-powered managed Level 2 station is significantly overpowered for drivers' commuting needs and is nearly 3x-5x the cost of power-managed Level 2 or Level 1 outlet solutions. When approaching charging infrastructure deployment, organizations should leverage power-managed Level 2 and Level 1 to minimize installation costs and increase charging access to help support the adoption of electric vehicles and accelerate rapid transportation decarbonization.

¹ For an overview of how power management works, please visit <https://www.peninsulacleanenergy.com/wp-content/uploads/2021/06/Overview-of-L1-and-ALMS-Strategy.pptx>

² https://www.peninsulacleanenergy.com/wp-content/uploads/2021/02/PCE_MinL1L2_CostAnalysisCPUC_011220.xlsx