

EV Charging: The Quiet Change

By Michael T. App, AIA

ADVANCEMENTS IN MOBILITY HAVE LED some city planners and architects to take the position that there won't be a need for parking garages in the future. They assume that everyone will be using ride-hailing services and won't own personal vehicles. This position always generates a lot of conversation. However, the quiet change that is happening—and rarely gets the same amount of coverage—is that several automakers are planning to halt production of the internal combustion engine and only release electric cars. This will require significantly more charging stations, and it has been said that the garage will be the gas station of the future.



Accommodating Electric Vehicles

A parking planner needs to consider several things when designing a parking garage to accommodate electric cars with charging stations. First, who are the users of the garage? Garages that serve offices have users who park and stay all day. Garages that serve residential units have users who park for long periods of time as well. Patrons using garages that serve shopping districts or hospitals typically are only parked for a few hours. Parkers at an airport may be parked for extended periods. Each of these uses would need a specific and different charging solution.

Charge times for electric vehicles (EVs) vary depending on battery pack size and vehicle power acceptance rate, with most requiring approximately four hours on a Level 2 station for a full charge. This typically equates to approximately 33 miles per hour of charge. The average U.S. resident drives approximately 13,500 miles per year, equating to 37 miles per day. Based on those statistics, it is possible that in one hour on a Level 2 charging station (a \$20,000 piece of equipment) an EV can achieve enough power to make the average commute to the office and back home each day. With the standard charging time, a Level 2 charging station could provide a full charge for two cars per day. Based on this mileage, an electric car would only need to achieve a full charge once every three days. This would allow six cars to be charged by a single Level 2 charging station. However, the reality is that most people park at their office in the morning and never move their cars until leaving, rendering the charging station unproductive most of the day.

In contrast, residential style Level 1 charging stations (a standard household outlet) could be provided. The charging time would be significantly longer, providing only six miles for every hour of charge, but there could be considerably more stations. Assuming that every car would charge every day for eight to 10 hours, each would have adequate power for daily commuting.

Garage Considerations

A parking garage owner has some considerations as well. The first question might be to ask, "Why are

electric-charging stations being installed?" It may be that the owner is trying to satisfy Parksmart requirements. Or the owner may be trying to entice EV owners to park in the garage.

A second question an owner might ask is, "How much charge needs to be provided?" Many owners are now realizing that they do not need to provide a full charge, and some are questioning the need to provide any charge at all. An owner would also need to determine if a fee for the power that is used by the electric car is worth trying to collect. In many cases, some owners of garages with charging stations have found the effort and cost to charge for the cost of the electricity used is more trouble than it is worth, so they just provide the power for free.

Recognizing that most charging can be done on a residential-style charging station, parking planners

must navigate through the design process with their clients to determine if it is necessary or desired to provide charging stations in public parking garages that serve hospitals, airports, office complexes, and shopping areas and what type of charging station to install. Parking planners working with those developing residential properties and the associated parking facility should recommend that a standard electrical outlet be provided for each parking stall, or provisions for the addition of 100 percent charging coverage, in preparation for a time when more of us are driving electric vehicles. ♦



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