SAINT PAUL
PLANNING & ECONOMIC DEVELOPMENT

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TO: Planning Commission

FROM: Comprehensive & Neighborhood Planning Committee; Bill Dermody, Principal City Planner

SUBJECT: Electric Vehicle Charging Zoning Study

Introduction/Study Purpose

Electric vehicle (EV) charging infrastructure will need to be greatly expanded in Saint Paul in the coming years in order to meet policy targets and projected market demand. Yet, if left solely to market forces, meeting future EV charging infrastructure needs will be much more costly and potentially leave many people struggling to participate in the EV revolution. Zoning Code amendments to implement established EV charging policy could help the city satisfy some of that demand in a more proactive, cost-effective, and equitable manner than a purely hands-off approach.

City policies support the expansion of EV charging infrastructure. The City's *Climate Action & Resilience Plan* (CARP) has set a goal of citywide carbon neutrality by 2050 and targets for electric vehicles (EVs) to constitute 33% of vehicles on Saint Paul streets by 2030, 80% by 2040, and 100% by 2050. It identifies several key initiatives to achieve those targets, including providing parking spaces and electrical capacity for EVs. Also, it notes that transportation accounts for approximately 30% of greenhouse gas emissions in Saint Paul. Policy T-4 of the City's *2040 Comprehensive Plan* calls for reducing carbon emissions from motor vehicles by developing infrastructure that supports vehicle electrification. These policies are complementary to State of Minnesota goals, such as 20% of light-duty vehicles on roads as EVs by 2030 and carbon neutrality by 2050.

On the market side, EV sales as a percentage of all vehicle sales in the US exceeded 5% in 2022 and are projected to exceed 50% by 2030 (Wall Street Journal 2023; McKinsey, 2021; KPMG, 2021). With more than half of EV charging projected to happen at home (KPMG, 2021; IEA, 2021), there is a great need to expand charging infrastructure that is accessible to Saint Paul residents, especially at home and elsewhere as needed.

Notably, provision of EV charging infrastructure will become increasingly complicated as EV adoption grows from predominantly wealthier demographics living in single-family homes to a broader segment of the population. An understanding of the anticipated barriers to increased EV charging provision can inform zoning policy to improve EV implementation in Saint Paul.

The following Background section addresses EV charging technology, existing EV charging availability, retrofits vs. new construction installation costs, the forecasted equity gap, and other cities' codes. A summary of proposed amendments, analysis, and a recommendation follow.

Background

EV Charging Technology

EV charging comes in three main technological categories: Level 1, Level 2, and Level 3. Level 1 charging, at 120 volts, is essentially a standard electric outlet with a cord connection – sometimes even a simple extension cord run out to a residential driveway. The costs to install Level 1 charging can be very cheap (a few hundred dollars per cord) if the outlets are already in the right locations. A battery electric vehicle (BEV, i.e. fully electric as opposed to a hybrid vehicle) can be recharged from empty by Level 1 chargers in 40-50 hours. Due to the long charging time, Level 1s are not anticipated to have a major role in the future EV charging network, especially considering that EV battery capacity (and thus the power needed to recharge) has been increasing.

Level 2 charging is 240 volts (in residential applications) or 208 volts (in commercial applications), which is the same voltage used by common home appliances like ovens, clothes dryers, or air conditioners. A BEV can be recharged from empty by Level 2 chargers in 4-10 hours. Level 2 chargers generally cost a few thousand dollars per connection to install, or more for retrofits involving substantial additional work. Level 2 chargers are commonly installed in both residential and commercial settings.

Level 3 charging, also known as Direct Current Fast Charging (DCFC), is anything greater than Level 2 power levels – actual amounts vary. A BEV can be recharged from empty by Level 3 chargers in 20-60 minutes. Some BEVs may suffer battery degradation if frequently charged by Level 3 chargers. Level 3 chargers cost substantially more than Level 2s to install (tens of thousands of dollars per connection) because of the units themselves and also the complexities of bringing a level of power that is not readily present in many settings. Thus, most EV charger installations are anticipated to be Level 2s in the near future. However, the better time-of-charge flexibility of Level 3s could present electricity cost savings and work better for the electricity network as overall system demand increases in the longer run. Also, as EV adoption increases and BEVs, perhaps, become more universally tolerant of regular Level 3 charging, one could imagine increased implementation of Level 3 chargers, especially in commercial or institutional settings where they could be marketed as amenities that generate customers or improve employee/ student retention.

Existing EV Charging Availability

The existing EV charging network in Saint Paul is rather sparse, though growing rapidly. On the public side, the City owns 23 public charging connections in downtown parking ramps and library/park parking lots around town. Additionally, the City has invested, with Minneapolis and HOURCAR, in the "Evie" EV carshare service, which allows many households to live with no owned cars or fewer owned cars – a double environmental benefit, as well as an economic benefit. The two cities also partner on the EV Spot Network, a collection of 70 strategically located curbside EV charging locations (typically each with two connections) for private EVs and shared "Evie" EVs. Most of the EV Spot Network chargers are Level 2, and about 10 are (or will be) Level 3. Both the Evie Carshare and EV Spot Network have been awarded funding to expand in the coming years. Of course, there have also been many private installations, including Level 2 EV chargers in retail and institutional parking lots, the occasional multifamily development, and numerous single-family homes. A Level 3 EV charger was installed in 2022 in the Target parking lot at Syndicate and University Avenues.

Retrofits vs. New Construction Installation Costs

EV charging infrastructure can be provided much more cost-effectively when integrated into new construction compared to via retrofits, especially for multifamily developments. Studies in Orlando, San Francisco, and Oakland have shown that EV charging retrofits cost two to ten times more than new construction installations. Meanwhile, costs to install EV charging infrastructure during new construction tend to represent a very small portion of overall project construction costs (0.09% in an Orlando 116-unit multifamily example). Single-family and duplex installations are often relatively easy and cheap – even for retrofits – because of electrical supply in the right general locations and existing power levels. Multifamily

settings are more difficult, typically with less convenient provision of EV charging unless significant investments are made. In larger parking settings, costs increase because control panels usually must be expanded to handle the additional appliances, electric lines must be brought longer distances, and more charging installations mean a greater likelihood of off-site infrastructure upgrades to provide more power to the site. Also, if those settings require retrofits, asphalt and concrete must be cut, trenched and patched, and sometimes long stretches of raceway are needed to work around obstacles. In short, larger parking facilities associated with multifamily residential are more complicated to install EV charging in, and much more expensive if they are retrofits.

Forecasted Equity Gap

Most EV charging occurs at home. However, it is easier and more cost-effective to install EV charging at single-family homes (especially if owned) than multifamily homes. This has an equity impact because renters in Saint Paul are far more likely to be housing cost-burdened than owners, and multifamily housing is usually rented. How big is this impact in Saint Paul?

About 44% of Saint Paul's 123,000 housing units are multifamily units today, while over 90% of all housing units to be added in the coming decades are anticipated to be multifamily (about 5,200 of the 5,400 housing units to be added by 2030 and ~11,000 of 11,400 housing units to be added between now and 2040). The amount of existing multifamily (alongside rental single-family and duplex residential) in Saint Paul presents a substantial challenge to EV charging provision. Meanwhile, the large number of multifamily units to be added in the coming decades presents an opportunity to reduce the long-term equity gap if EV charging infrastructure is added proactively with the developments, rather than as retrofits.

Since multifamily retrofits are so difficult, EV charging will likely also need to be installed at nonresidential locations and on-street in order to meet projected demand. Thus, robust EV charging requirements for nonresidential parking should also be considered as part of a multi-prong strategy to ensure broad EV charging availability to Saint Paul residents in the future.

Survey of other cities

It has become increasingly common for governments to address EV charging requirements in state or local codes. In our region, Minneapolis, St. Louis Park, and Bloomington all have minimum EV parking requirements and other EV charging regulation. Most cities that have addressed the issue take some or all of the following measures in their codes:

- Provide definitions;
- Permit EV charging in certain zoning districts or use classifications;
- Require a certain percentage of new parking spaces to have an EV charging connection present (typically 2 to 10% of spaces, sometimes with different requirements for residential versus other uses);
- Require a certain percentage of new parking spaces to have EV charging capability or readiness (anywhere from 10% to 100% of spaces).

In most cases surveyed, any EV parking minimums apply equally to all uses, though in some cases they are more rigorous for residential uses than commercial uses (or in Bloomington, only apply to multifamily residential). Please see attached spreadsheet for a more detailed survey of comparison cities.

Proposed amendments

The proposed draft Zoning Code amendments serve to establish minimum EV parking space amounts, both for actual EV charging connections and for potential future connections ("EV capable"), styled after the Zoning Code minimums for bicycle parking and accessible parking for those with mobility impairments. The EV parking minimums are proposed to apply to new parking lots with 15+ spaces or

parking lot expansions of 15+ spaces, with differentiated requirements for facilities intended to serve any use that includes multi-family residential (including mixed use) versus facilities that serve other uses like office, industrial, institutional, congregate living, or purely commercial. Relevant definitions are effectively established via the text establishing the minimum requirements.

The proposed amendments refer to requirements for Level 2 or greater charging connections, which would include Level 3 chargers.

The precise draft amendments are contained in the memo attachments.

Analysis

Improving EV charging infrastructure is supported by both the *2040 Saint Paul Comprehensive Plan* and the *Climate and Resiliency Plan*. The proposed amendments would further Comp Plan Policy T-4 ("Significantly reduce carbon emissions from motor vehicles by developing infrastructure that supports vehicle electrification.") and CARP's long-term carbon neutrality goal and EV targets (33% of Saint Paul vehicles by 2030, 80% by 2040, 100% by 2050).

Level 3 charging is often compared to gas stations and sometimes regulated similarly in other cities, but it should be permitted citywide as a potential feature of parking spaces for several reasons:

1. Lesser pollution concern than gas stations.
2. Less traffic generation than gas stations due to slower turnover, with Level 3 recharging taking around 30 minutes compared to only a couple minutes for gasoline refueling.
3. A very strong need to expand EV charging capacity and the potential that any customer-attracting business could decide to add EV charging as an amenity.
4. An anticipated need to serve uses in both commercial and residential zoning districts, including colleges, parks, and existing multifamily buildings that are residentially zoned.
5. The potential that several well-placed Level 3 chargers in multifamily buildings could prove more cost-effective than more broadly implemented Level 2 chargers, while serving similar numbers of residents.

Committee Recommendation

The Comprehensive & Neighborhood Planning Committee recommends initiation of the Electric Vehicle Charging Zoning Study, release of draft code amendments for public review, and setting a public hearing for July 7, 2023.

Attachments

1. Draft Planning Commission Resolution to initiate study
2. Draft EV Charging Code Amendments
3. Other Cities' EV Charging Regulations