

Peninsula Advanced Energy Community (PAEC)

Task 6.2: Final Potential Locations for the Electric Vehicle Charging Infrastructure Master Plan *Evaluation and Recommendations*

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I. About the Authors

a. Sven Thesen & Associates

Sven Thesen & Associates (STA) is a small electric vehicle and energy consulting firm located in Palo Alto with over 20 years of experience in the energy/ environmental space and 12 years focusing on electric vehicles and the electric utility nexus. At present, the firm assists local and regional governments, private employers and non-profits make intelligent, cost conscious choices in deploying electric vehicle infrastructure (EVCI). Recent activities in addition to the Clean Coalition Peninsula Advanced Energy Community include obtaining a \$240k Bay Area Air Quality Management (BAAQMD) grant for the city of Palo Alto to install 40 Level 2 chargers and co-organizing/ co-writing the June 2017 EV Adoption Accelerator Charrette and associated White Paper.

b. About the Clean Coalition

The Clean Coalition is a nonprofit organization whose mission is to accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise. The Clean Coalition drives policy innovation to remove barriers to procurement and interconnection of distributed energy resources (DER) such as local renewables, energy storage, and demand response. The Clean Coalition also establishes programs and market mechanisms that realize the full potential of integrating these solutions. In addition to being active in numerous proceedings before state and federal agencies throughout the United States, the Clean Coalition collaborates with utilities (and other Load Serving Entities) and municipalities (and other jurisdictions) to create near-term deployment opportunities that prove the technical and economic viability of local renewables and other DER.

Ultimately, the Clean Coalition envisions the United States being 100% powered by renewable energy, substantially from local sources. To make this goal a reality, the Clean Coalition is working to achieve the following objectives by 2020:

- From 2020 onward, at least 80% of all electricity from newly added generation capacity in the United States will be from renewable energy sources.
- From 2020 onward, at least 25% of all electricity from newly added generation capacity in the United States will be from local renewable energy sources.
 - Locally generated electricity does not travel over the transmission grid to get from the location it is generated to where it is consumed.
- By 2020, policies and programs are well established for ensuring successful fulfillment of the other two objectives.
 - Policies reflect the full value of local renewable energy.
 - Programs prove the superiority of local energy systems in terms of economics, environment, and resilience; and in terms of timeliness.

Visit us online at www.clean-coalition.org.

II. Legal Disclaimer

This document was prepared as a result of work sponsored by the California Energy Commission. It does not necessarily represent the views of the Energy Commission, its employees, or the State of California. Neither the Commission, the State of California, nor the Commission's employees, contractors, nor subcontractors makes any warranty, express or implied, or assumes any legal liability for the information in this document; nor does any party represent that the use of this information will not infringe upon privately owned rights. This document has not been approved or disapproved by the Commission, nor has the Commission passed upon the accuracy of the information in this document.

III. Executive Summary

The Clean Coalition is recommending the disadvantaged horse shoe shaped area of Redwood City (RWC) as defined by a score greater than 81% in the CalEnviroScreen 3.0 model and as shown in red by Figure 1 as the primary geographic location for the Clean Coalition's Peninsula Advanced Energy Community (PAEC) Electric Vehicle Charging Infrastructure-Master Plan (EVCI-MP). Further, to demonstrate replicability, the Clean Coalition also recommends the southwest area of East Palo Alto (EPA) as a secondary EVCI-MP location as illustrated by Figure 2. This area of East Palo Alto is likewise defined by a score greater than 81% in the CalEnviroScreen 3.0 model. These recommendations are based on existing geographic charging density, available EVCI financing, and other criteria. In summary, both geographic locations currently have the least dense charging infrastructure in San Mateo County, the potential for 80% to 90%+ EVCI funding via PG&E's Charge Network Program, and large and growing number of workplace and multi-unit dwelling potential hosts.

Detailed deployment site designs and cost estimates are not included in this report but will be included in Task 6.3, Report on EVCI-MP.

Figure 1: Redwood City EVCI -MP Location

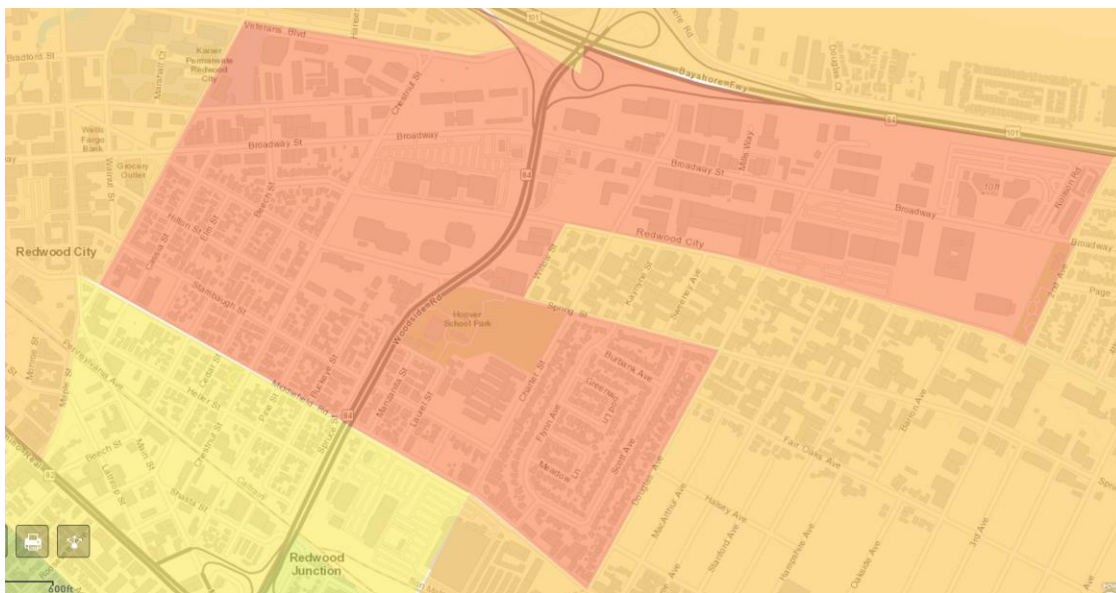
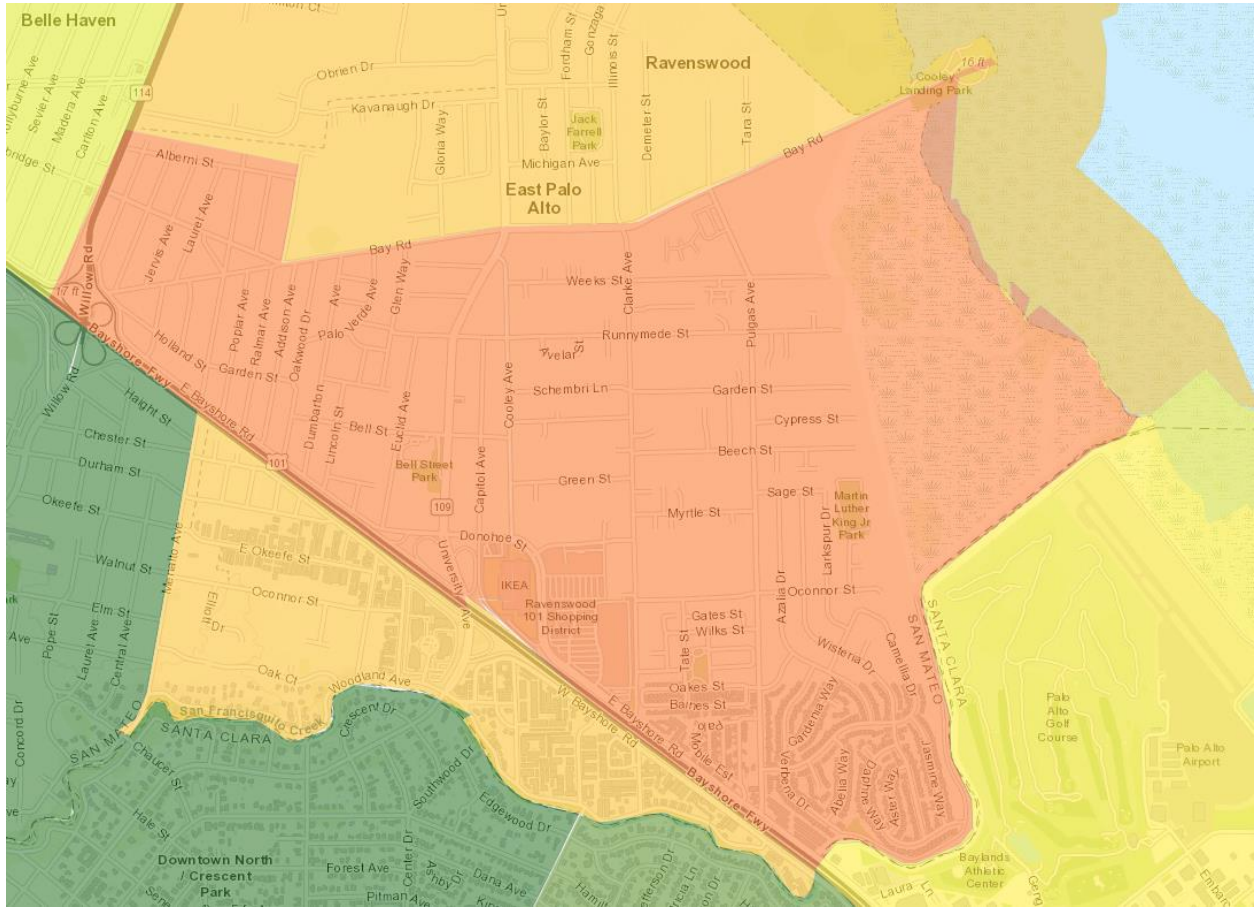


Figure 2: Southwest Area of East Palo Alto, Secondary Location



IV. Evaluation Background

In evaluating the County of San Mateo and its multiple municipalities for potential EVCI-MP locations, four criteria were identified and evaluated against. These include:

a. Existing Geographic Charging Density

In selecting existing geographic charging density (EGCD) as a criterion, it is understood that areas with dense EVCI are indicative of high EV adoption rates particularly if there are residences willing to share their personal home charger. Likewise, areas with equivalent population density with low density EVCI is indicative of a low EV adoption rate and therefore more in need of a EVCI-MP as compared to a dense EVCI neighborhood. One way to determine EGCD is via the application, PlugShare.com, which geographically maps EVCI (public, private and residential).

From PlugShare.com, Figure 3 details the EVCI density (Level two and DCFC) in the Horseshoe area of Redwood City. There are only three publicly available EVCI sites, one of which is only open to the public, 6pm-midnight. This is compared to Figure 4, Downtown Redwood City, and Figure 5 San Mateo County overall. Likewise, the southwest area of East Palo Alto also has a dearth of EVCI as shown on Figure 6.

The legend below represents the various EVCI installation types as referenced in Figures 3 through 6:

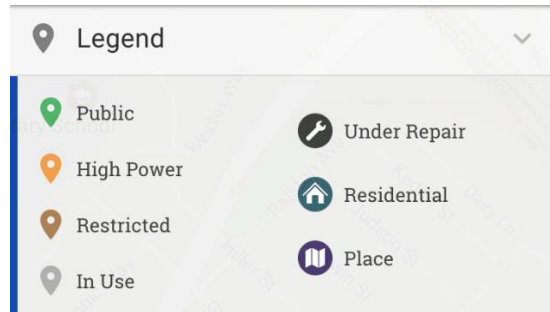


Figure 3: EVCI Density, Horse Shoe Area, Redwood City

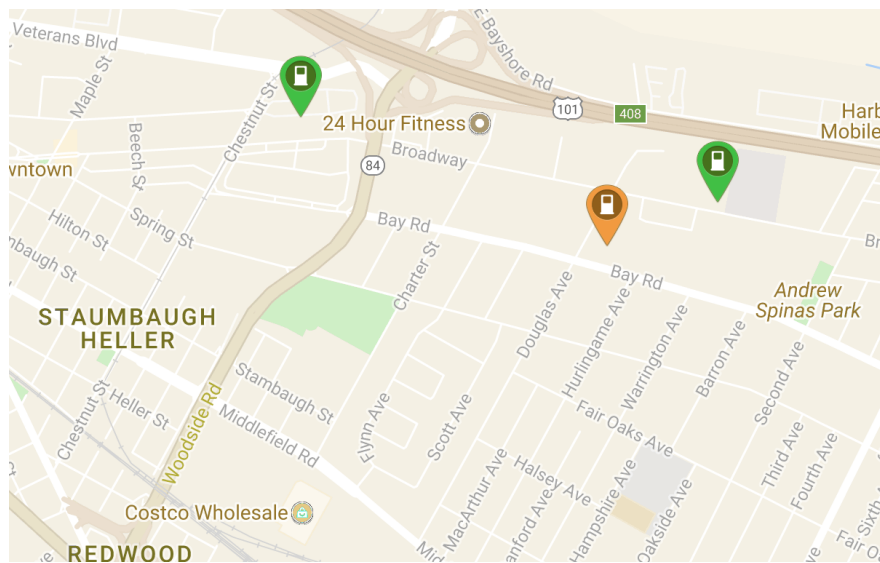


Figure 4: EVCI Density, Downtown Redwood City

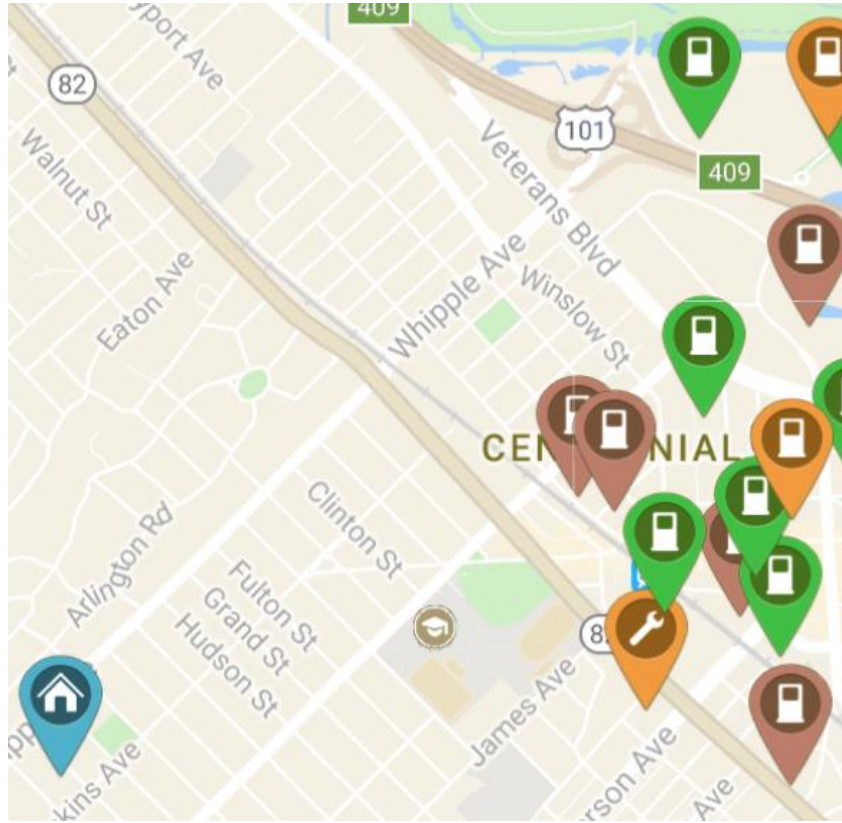


Figure 5: EVCI Density, San Mateo County

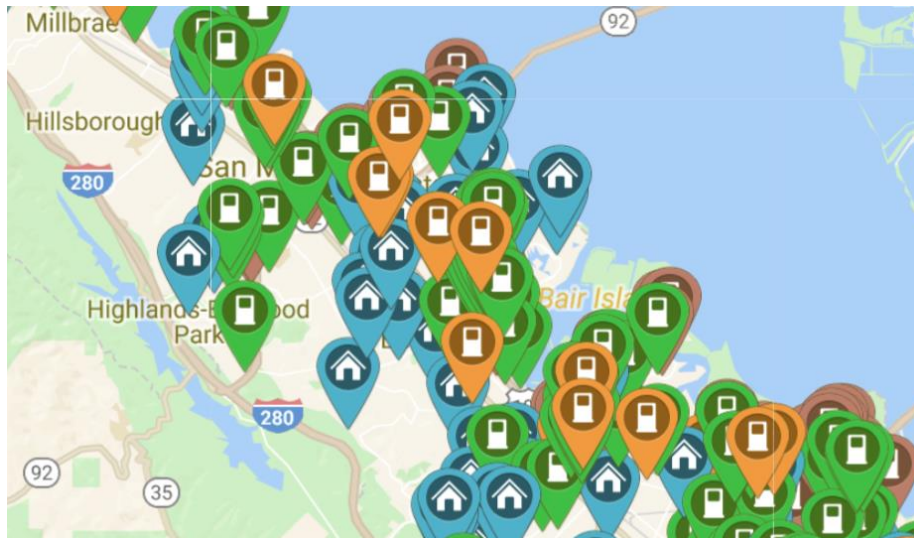
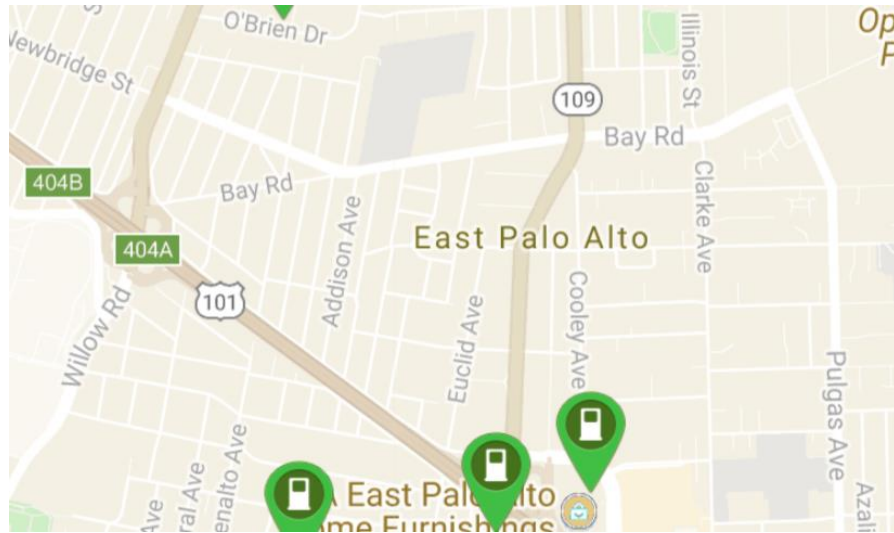


Figure 6: EVCI Density, East Palo Alto



b. Available EVCI Funding

Based on the work completed under the CEC's ARV-14-057/ PON-14-607 four different EVCI funding opportunities were identified as applicable to potential host sites in San Mateo County. They are, as summarized:

1. BAAQMD, Charge! Program: \$3k/ level 2 charger; \$18k/ direct current fast chargers (DCFC); paperwork to complete application and ongoing record keeping & reporting requirements plus kWh use requirements and 25% matching. 4-L2 or 1 DECF charger minimum/ application. Focus is transportation corridors, destination multi-unit dwellings and transit parking facilities. May be private chargers for the tenants/ employees and their guests. Minimum grant request \$10k.
<http://www.baaqmd.gov/grant-funding/businesses-and-fleets/charge>
2. Tesla - Proprietary DCFC: Minimum of 10 DCFC chargers per site; must be open to the public. Free install, maintenance and operations. Primary focus is transportation corridors and destination charging as opposed to workplace or residential. Dan Cronin, dcronin@tesla.com>
3. Electrify America: Minimum of 6 DCFC and Level 2 chargers combination per site; must be available to the public. Primary focus is transportation corridors and destination charging as opposed to workplace or residential. Free install, maintenance and operations. Kirk DeClark, kirk@lockehouse.com
4. PG&E: EV Charge Network Program, minimum of 10, Level 2 chargers per site. Focus is workplace and multi-unit dwellings. May be private chargers for tenants/ employees. Funding covers 80%-90%+ of the install and EVSE depending on whether in a disadvantaged community area or not plus if the EVCI is for workplace

or multi-unit dwellings; does not cover ongoing electricity costs.

https://www.pge.com/en_US/business/solar-and-vehicles/your-options/clean-vehicles/charging-stations/ev-charge-network.page?WT.mc_id=Vanity_evcharge

Given the above, the PG&E Charge Network program, with their focus on workplace and multi-unit dwellings and additional funding for disadvantaged community areas, was determined to be the most appropriate funding program for workplace and multi-unit dwellings in the horse shoe area of RWC and EPA.

c. Input from Municipal and County Sustainability Managers

In discussing EVCI with County and Municipal Sustainability Managers, it was found that the County and Municipal Sustainability Managers felt that it was not a priority to install EVCI unless the EVCI was free or essentially free. As noted above, given the limited funding available to install EVCI, it was determined that it was a better use of public funds to develop an EVCI-MP for areas that had real potential to implement (horse shoe area of RWC and the southwest area of EPA) versus a paper study that was highly unlikely to be executed on.

d. Host Site Potential

As noted above, in San Mateo County, the County and Municipal Sustainability Managers were not willing to install EVCI unless it was free or essentially free. In considering businesses, multi-unit dwellings, or other organizations (educational entities, religious establishments or other not for profits) as potential hosts, again based on the work completed under CEC's ARV-14-057/ PON-14-607, it was also determined that these entities likewise would not install EVCI except under one of two conditions. Either the EVCI would have to be essentially free or the entity would install EVCI as requested by their employees/residents versus installing EVCI in an externally organized-facilitated fashion within the context of an EVCI-MP.

V. Conclusion and Recommendations

Based on an evaluation against the above criteria including the current EVCI density, funding available, the willingness of the RWC and EPA Sustainability Managers to host EVCI on their applicable city locations, plus participation by other entities, the Clean Coalition recommends developing and executing on EVCI-MPs for the horse shoe area of Redwood City and the southwest area of East Palo Alto.

Detailed deployment site designs and cost estimates are not included in this report, but will be included in Task 6.3, Report on EVCI-MP.