

Charging the Future: EV Infrastructure in the City of Santa Clara

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Introduction

As the number of Electric Vehicles (EVs) throughout the Bay Area grows, providing an electric charging infrastructure that meets demand continues to challenge local stakeholders. In order to address issues such as range anxiety, high infrastructure costs, and charging rates, identifying viable locations for chargers that understand the local market and establish public/private partnerships is critical.

In partnership with Silicon Valley Power (SVP) we have recommended the strategic placement of 8 new publicly owned and accessible EV charging locations as well as provided guidance for steps to streamline future implementation. Guided by qualitative and quantitative analysis, we see our recommendations providing a unique perspective on Santa Clara's local charging environment.

Research Questions

What factors are important in building an EV charging network?

What are the qualities of a successful charging station?

Where should Silicon Valley Power place their new EV charging stations?

Methods

GIS Analysis: Using SVP's existing data and additional parameters we explored ideal locations for new charging stations. This comprised the data driven portion of our analysis.

Surveys: We distributed in-person and online surveys to better understand the general demographic of electric vehicle owners. Owners were also asked about their preference of charger location.

Stakeholder Interviews: Using

SVP contacts and further networking we conducted 7 structured interviews with various public and private stakeholders. This provided us with insights on a variety of implementation considerations and a view into the current state of charger implementation throughout the Bay Area.



Picture 1: Community Survey Distribution

Findings

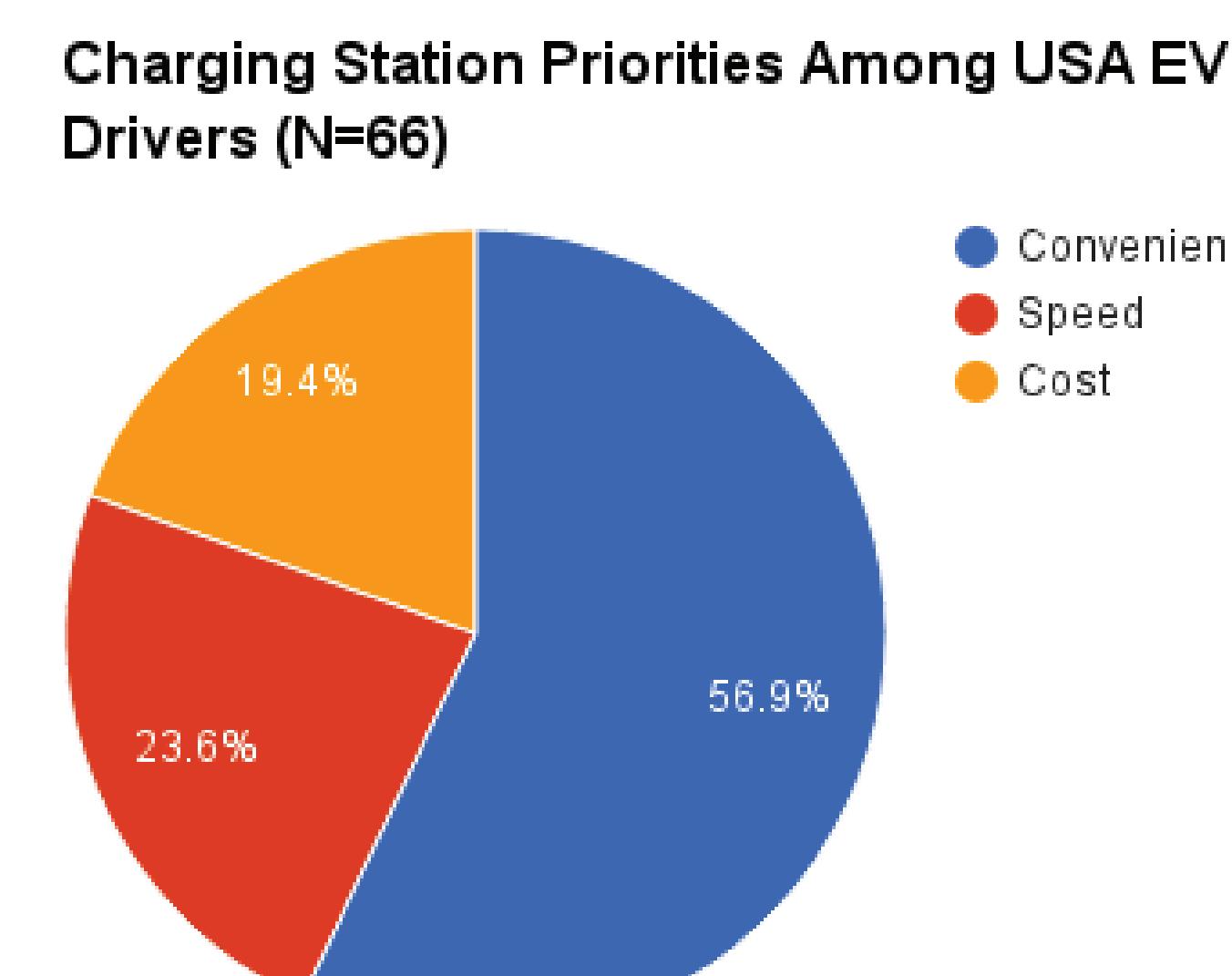


Figure 1: Charging Priorities

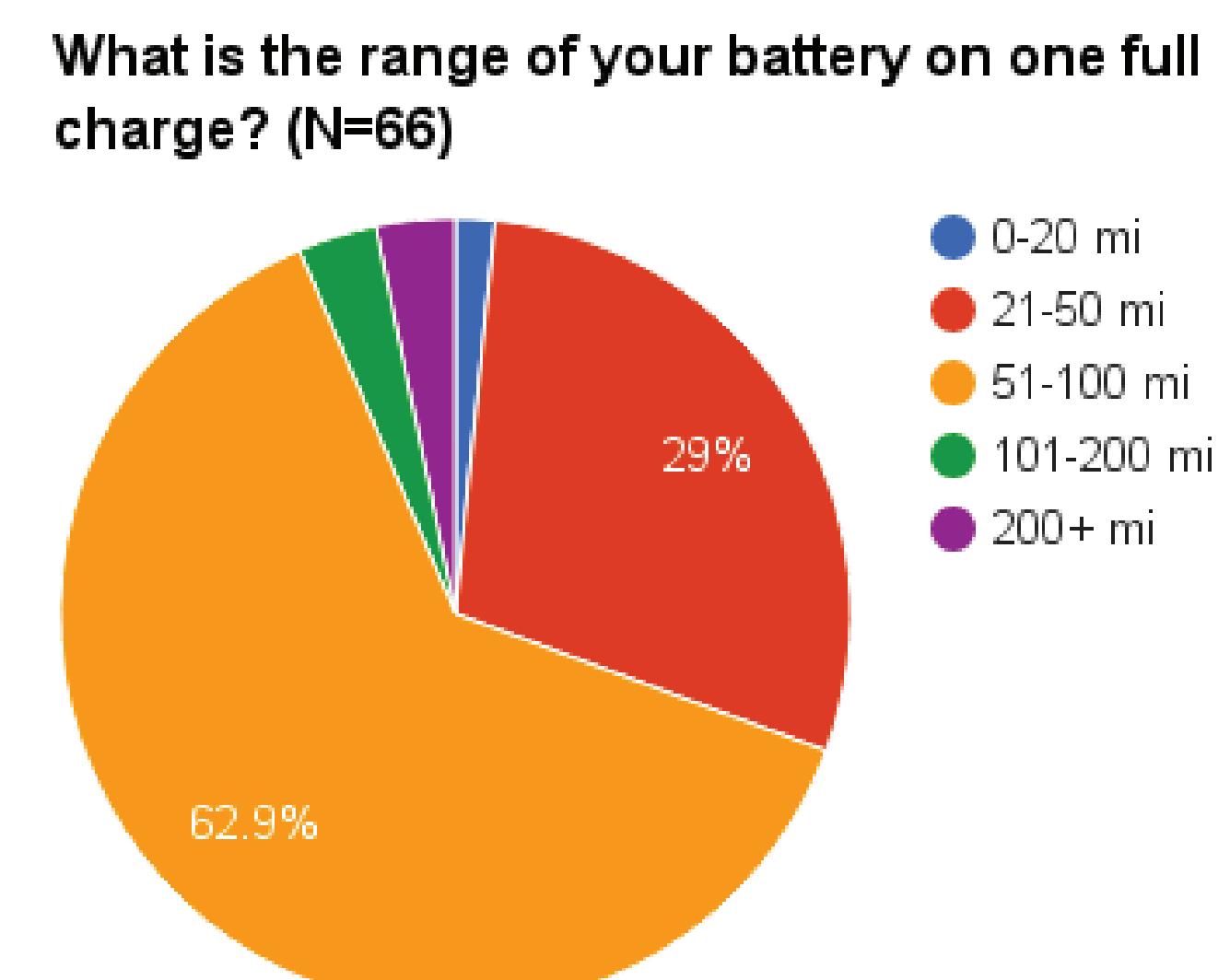


Figure 2: Battery Range

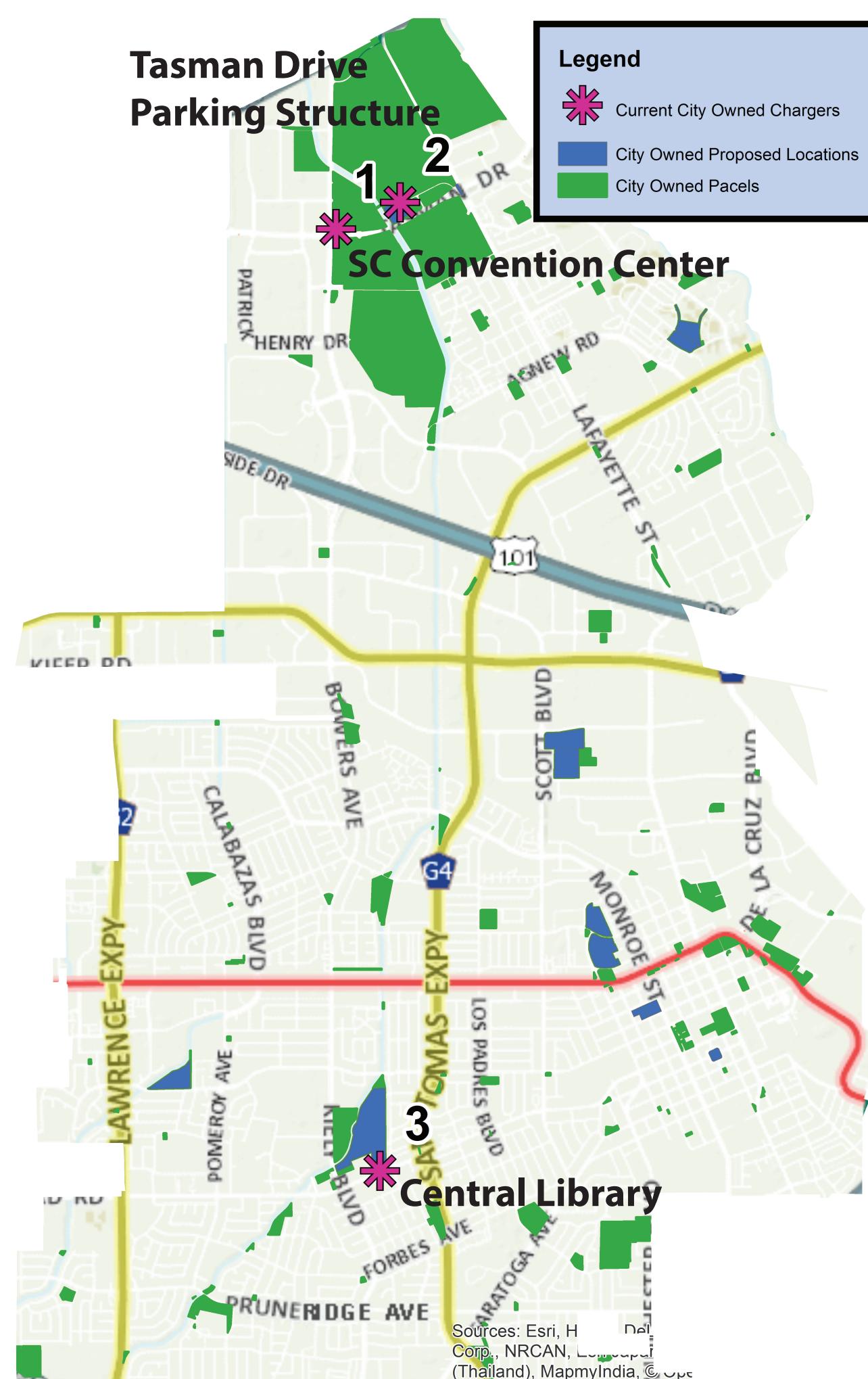


Figure 3: Current Owned and Proposed Public EV Infrastructure

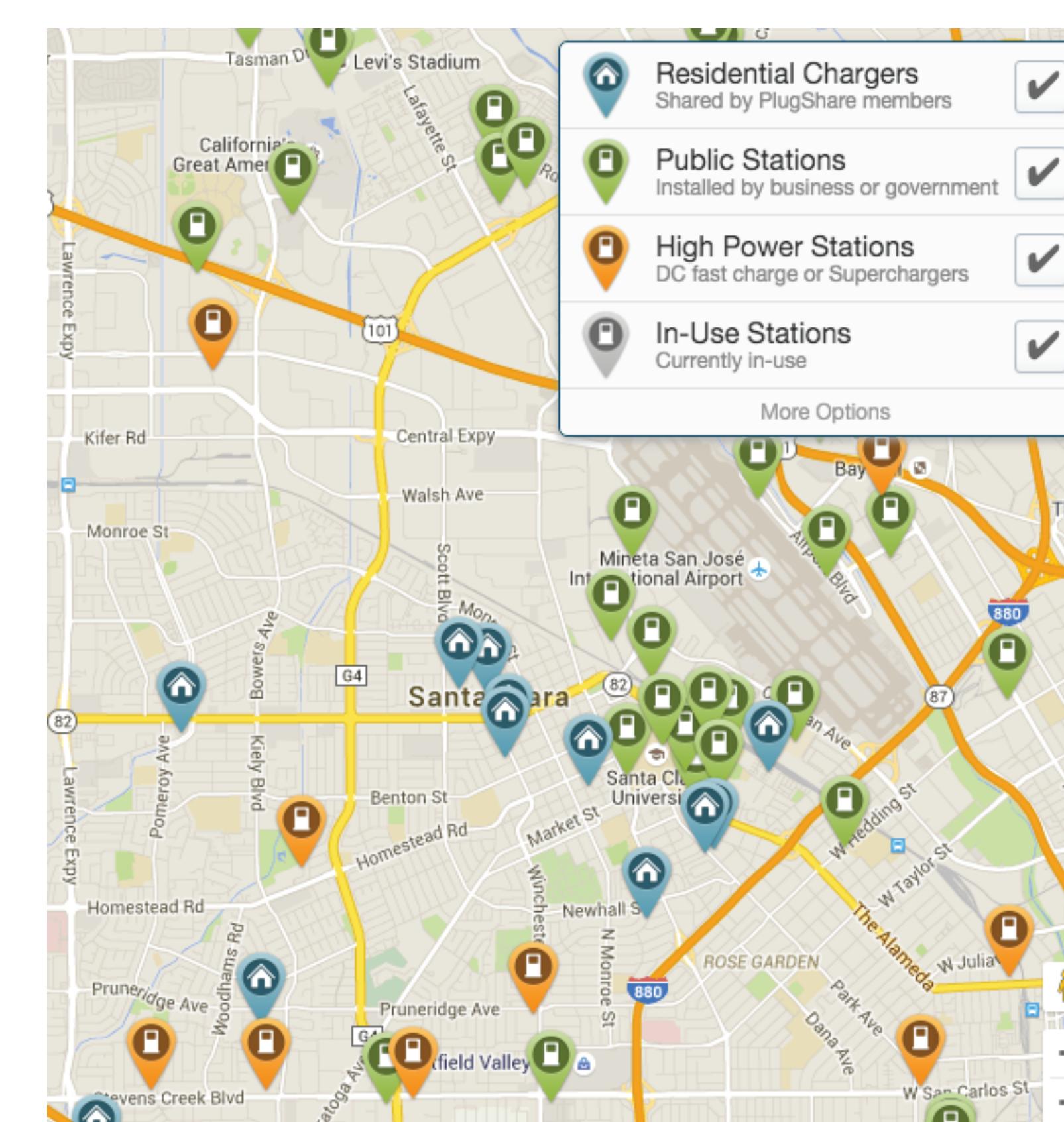


Figure 4: Current Charging Infrastructure in the City of Santa Clara
Source: <http://www.pluginshare.com/>

Conclusions

1. Most EV drivers charge at home or at work, therefore placement of publicly owned chargers need to fill in the gaps for incoming commuters, errands and leisure activities.
2. A mix of Level 1, 2 and 3 chargers are ideal to serve a community of diverse needs. Considering the charging level need for the community is critical prior to installation to ensure that stations and funds are used effectively.
3. Lack of legal support, an inefficient permitting process, and political barriers continue to hinder the speed of charger installation. The most common barriers are lack of legal support for multi-family residences, incomplete permit processes (fail to track where home chargers are installed) and ADA compliance.

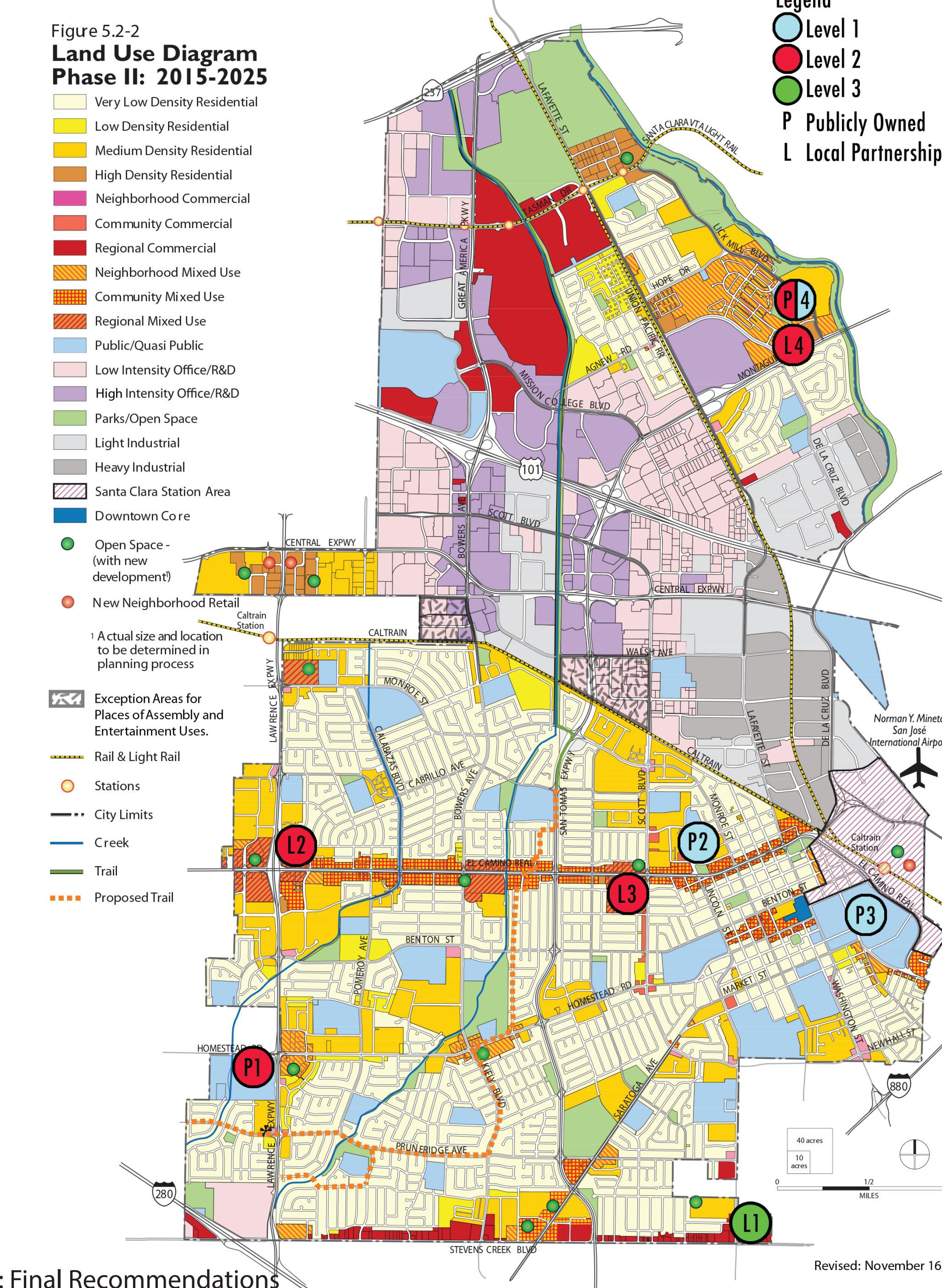


Figure 5: Final Recommendations

Source: <http://santaclaraca.gov/home/showdocument?id=4499>

Recommendations

In light of our conclusions, we recommend SVP place new chargers in the 8 proposed locations on the above map. These locations were selected based on multiple parameters detailed below.

| Partnership Type | Destination Name | Address |
|------------------|--|--------------------------------------|
| L1 | Westfield Valley Fair Parking Garage | 2855 Stevens Creek Blvd, Santa Clara |
| L2 | Lawrence Square Shopping Center | 3511 El Camino Real, Santa Clara |
| L3 | Santa Clara Town Center | 2082 El Camino Real, Santa Clara |
| L4 | Rivermark Village Parking Lot | 3945 Rivermark Plaza, Santa Clara |
| P1 | Kaiser Permanente Santa Clara Medical Center | 700 Lawrence Expressway, Santa Clara |
| P2 | City of Santa Clara Main Office | 1500 Warburton Ave, Santa Clara |
| P3 | Santa Clara Transit Center | 1001 Railroad Ave, Santa Clara |
| P4 | Northside Branch Library | 695 Moreland Way, Santa Clara |

Parameters

(1) Housing Density, (2) Proposal by SVP, (3) Proximity to all Existing Chargers, (4) Proximity to Designated Destinations, (5) Proximity to Public Land, (6) Proximity to Major Roads

References

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Kuban, Deab. "Electric Vehicle Infrastructure Study Session." Electric Vehicle Infrastructure - City of Santa Monica. The City of Santa Monica, 8 Nov. 2011. Web. 26 Feb. 2016.

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