

Tulare County Association of Governments (TCAG)



TCAG Electric Vehicle Implementation Study



Engineering and Planning | Energy Efficiency | Sustainability
1115 W Sunset Blvd, Suite 805, Los Angeles, CA 90012
201 Mission Str, Suite 2000, San Francisco, CA 94105

August 2019

TABLE OF CONTENTS

| | |
|---|-----|
| List of Tables | iii |
| List of Figures | iv |
| Summary of Acronyms | v |
| Executive Summary..... | 1 |
| Introduction | 2 |
| Case Studies in Tulare County..... | 4 |
| City of Visalia – Goshen Village II, Visalia Mall and Tulare County Superior Courthouse | 4 |
| City of Tulare – Tulare Public Library..... | 12 |
| City of Porterville – Downtown Parking Lot & Target Parking Lot | 16 |
| City of Dinuba – Transit Parking Lot | 22 |
| City of Lindsay – Olivewood Plaza & Lindsay Branch Library | 26 |
| City of Farmersville – Rest Stop..... | 32 |
| City of Exeter – Shopping Plaza | 36 |
| City of Woodlake – Community Center..... | 39 |
| Case Study Barriers & Opportunities Summary | 42 |
| Barriers and Opportunity Report | 44 |
| Lack of Public Awareness | 46 |
| Economic Challenges..... | 48 |
| Access for Disadvantaged Communities (DACs) and Multi-Unit Dwellings | 50 |
| Charging Station Siting Guidelines | 52 |
| Parking and Signage | 53 |
| Building Code for PEV Charging..... | 55 |
| Zoning Policy for EVs | 55 |
| Permitting and Inspection | 56 |
| Training for Electrical Contractors..... | 57 |
| Workplace Charging | 58 |
| Fleet Electrification..... | 59 |
| Utility System Impacts and Rate Design..... | 60 |
| Overview of Best Practices | 61 |
| San Joaquin Valley Plug-In Electric Vehicle (PEV) Readiness Plan and Planning Guide | 62 |
| Self Help Enterprises (S.H.E.) Outreach..... | 63 |
| SCE Charge Ready..... | 63 |
| Electrify America | 64 |



| | |
|--|----|
| Valley Clean Air Now | 64 |
| Ride and Drive Events..... | 64 |
| Direct Financial Incentives..... | 65 |
| Charging Incentives | 65 |
| Non-Financial Incentives | 65 |
| Car Sharing Programs | 66 |
| California Building Code | 66 |
| Other General Strategies and Best Practices | 67 |
| Siting Selection and Analysis | 68 |
| Funding Rebate and Incentive Options for EVs and EVSEs | 72 |
| Conclusion..... | 75 |
| APPENDICES | 76 |
| List of Contacts for Case Study Sites: | 77 |



List of Tables

| | |
|--|----|
| Table 1 - Final Site Selection for EV Charger Implementation | 2 |
| Table 2 – Estimated Cost and Funding Analysis (Single L2 charger): Goshen Village II | 10 |
| Table 3 - Estimated Cost and Funding Analysis (Two L2 chargers): Goshen Village II | 10 |
| Table 4 - Estimated Cost and Funding Analysis (Single L3 charger): Visalia Mall | 11 |
| Table 5 - Estimated Cost and Funding Analysis (Five L2 charger): Visalia Mall | 11 |
| Table 6 - Estimated Cost and Funding Analysis (Single L2 charger): Tulare County Superior Courthouse (Visalia) | 11 |
| Table 7 - Estimated Cost and Funding Analysis (Two L2 chargers): Tulare County Superior Courthouse (Visalia) | 12 |
| Table 8 – Estimated Cost Analysis (Single L2 charger): Tulare Library..... | 15 |
| Table 9 - Estimated Cost Analysis (Two L2 chargers): Tulare Library..... | 16 |
| Table 10 – Estimated Cost and Funding Analysis (Single L2 charger): Porterville Downtown Parking Lot..... | 21 |
| Table 11 – Estimated Cost and Funding Analysis (Two L2 chargers): Porterville Downtown Parking Lot..... | 21 |
| Table 12 – Estimated Cost and Funding Analysis (Single L2 charger): Porterville Target..... | 22 |
| Table 13 – Estimated Cost and Funding Analysis (Five L2 chargers): Porterville Target..... | 22 |
| Table 14 – Estimated Cost and Funding Analysis (Single L2 charger): Dinuba Transit Center..... | 25 |
| Table 15– Estimated Cost and Funding Analysis (Two L2 chargers): Dinuba Transit Center..... | 25 |
| Table 16 – Estimated Cost and Funding Analysis (Single L2 charger): Olivewood Plaza (Lindsay) | 31 |
| Table 17 – Estimated Cost and Funding Analysis (Two L2 chargers): Olivewood Plaza (Lindsay) | 31 |
| Table 18 – Estimated Cost and Funding Analysis (Single L2 charger): Lindsay Branch Library..... | 32 |
| Table 19 – Estimated Cost and Funding Analysis (Two L2 chargers): Lindsay Branch Library..... | 32 |
| Table 21 – Estimated Cost and Funding Analysis (Single L3 Charger): Woodlake Community Center..... | 35 |
| Table 22 – Estimated Cost and Funding Analysis (Single L2 charger): Shopping Plaza (Exeter) | 39 |
| Table 23 – Estimated Cost and Funding Analysis (Two L2 chargers): Shopping Plaza (Exeter) | 39 |
| Table 20 - Estimated Cost and Funding Analysis (Single L3 Charger): Woodlake Community Center..... | 42 |
| Table 24 - Summary of Barriers for Tulare County | 42 |
| Table 25 – Overview of Best Practices..... | 43 |
| Table 26 – Summary of Barriers in Tulare County | 45 |
| Table 27 – Public Awareness Opportunities and Resources..... | 47 |
| Table 28 – Economic Challenge Opportunities and Resources | 49 |
| Table 29 – DACs and MUDs Opportunities and Resources..... | 51 |
| Table 30 – Charging Station Siting Opportunities and Resources | 53 |
| Table 31 – Parking and Signage Opportunities and Resources | 54 |
| Table 32 – Building Code Opportunities and Resources..... | 55 |
| Table 33 – Zoning Policy Opportunities and Resources..... | 55 |
| Table 34 – AHJs in Tulare County | 56 |
| Table 35 – Permitting and Inspection Siting Opportunities and Resources | 57 |
| Table 36 – Electrical Contractor Training Opportunities and Resources..... | 58 |
| Table 37 – Workplace Charging Opportunities and Resources | 59 |
| Table 38 – Fleet Electrification Opportunities and Resources..... | 60 |
| Table 39 – Utility System Impact and Rate Design Opportunities and Resources..... | 61 |
| Table 40 – Overview of Best Practices..... | 61 |
| Table 41 – Site Selection Guidelines..... | 68 |
| Table 42 – Site Design Elements..... | 69 |
| Table 43 – Factors Affecting EVSE Installation | 69 |
| Table 44 – Summary of Funding, Rebate and Incentive Options for EVs | 72 |
| Table 45 - Summary of Funding, Rebate and Incentive Options for EVSEs | 73 |



List of Figures

| | |
|--|----|
| Figure 1 - EV Charger Map of Visalia | 4 |
| Figure 2 - Aerial photograph of Goshen Village II: 30940 Road 72, Goshen, CA | 5 |
| Figure 3 - Site location for EV charger placement – Goshen Village II | 6 |
| Figure 4 - Aerial photograph of Visalia Mall: 2031 S Mooney Blvd, Visalia, CA 93277 | 7 |
| Figure 5 - Site location for EV charger placement – Visalia Mall (W Parking site) | 8 |
| Figure 6 - Aerial photograph of Tulare County Superior Courthouse: 221 S Mooney Blvd, Visalia, CA 93291 | 8 |
| Figure 7 - Site location for EV charger placement – Tulare County Superior Courthouse | 9 |
| Figure 8 - EV Charger Map of Tulare | 13 |
| Figure 9 - Aerial photograph of Tulare Public Library: 475 N M St, Tulare, CA 93274 | 14 |
| Figure 10 - Site location for EV charger placement - Tulare | 14 |
| Figure 11 - EV Charger Map of Porterville | 17 |
| Figure 12 - Aerial photograph of Downtown Parking Lot: E of 2nd Street, between E Garden Ave & Olive Ave | 18 |
| Figure 13 - Site location for EV charger placement – Downtown Parking Lot in Porterville | 18 |
| Figure 14 - Aerial photograph of Target: 1363 W Henderson Ave, Porterville, CA 93257 | 19 |
| Figure 15 - Site location for EV charger placement – Target in Porterville | 20 |
| Figure 16 - EV Charger Map of Dinuba | 23 |
| Figure 17 - Aerial photograph of Dinuba Transit Center: W Fresno St, between N M St. and N L St. | 24 |
| Figure 18 - Site location for EV charger placement | 24 |
| Figure 19 - EV Charger Map of Lindsay | 27 |
| Figure 20 - Aerial photograph of Olivewood Plaza: 210 CA-65, Lindsay, CA 93247 | 28 |
| Figure 21 - Site location for EV charger placement – Olivewood Plaza (Lindsay) | 28 |
| Figure 22 - Aerial photograph of Lindsay Branch Library: 157 N Mirage Ave, Lindsay, CA 93247 | 29 |
| Figure 23 - Site location for EV charger placement – Lindsay Branch Library | 30 |
| Figure 24 - EV Charger Map of Farmersville | 33 |
| Figure 25 - Aerial photograph of Farmersville Rest Stop: 452 Avenue 295, Farmersville, CA 93223 | 34 |
| Figure 26 - Site location for EV charger placement – Farmersville Rest Stop | 34 |
| Figure 27 - EV Charger Map of Exeter | 36 |
| Figure 28 - Aerial photograph of Save Mart parking lot: 1121 W Visalia Rd, Exeter, CA 93221 | 37 |
| Figure 29 - Site location for EV charger placement – Save Mart (Exeter) | 38 |
| Figure 30 - EV Charger Map of Woodlake | 40 |
| Figure 31 - Site location for EV charger placement | 41 |
| Figure 32 - EVSE in Tulare County | 46 |
| Figure 33 - Range and price of available EVs | 47 |
| Figure 34 - Tulare County Disadvantaged Communities from CalEnviroScreen 3.0 | 50 |
| Figure 35 - Map of DACs and low-income communities in Tulare County | 51 |
| Figure 36 - EV/Disability Parking signage at City of Visalia Administration parking lot | 54 |
| Figure 37 - Median EV ranges between Model Year 2011 and Model Year 2018 Vehicles | 58 |
| Figure 38. Designated parking for clean air vehicles from 2016 CALGreen code | 66 |
| Figure 39. EV charging space calculation from 2016 CALGreen code | 67 |



Summary of Acronyms

| Acronym | Definition |
|-------------|---|
| AHJ | Authority Having Jurisdiction |
| CBO | Community Based Organization |
| DAC | Disadvantaged Community |
| EV | Electric Vehicle |
| EV Charger | Electric Vehicle Charger |
| EVSE | Electric Vehicle Supply Equipment |
| GSA | General Services Administration |
| ICE Vehicle | Internal Combustion Engine Vehicle |
| IOU | Investor Owned Utility |
| MUD | Multi-Unit Dwellings |
| MY | Model Year |
| PEV | Plug-in Electric Vehicle |
| PG&E | Pacific Gas & Electric |
| SCE | Southern California Edison |
| SJVAPCD | San Joaquin Valley Air Pollution Control District |
| USD | Unified School Districts |
| ZEV | Zero-Emission Vehicle |



Executive Summary

Tulare County is located in California's San Joaquin Valley. The county is located between the Sierra Nevada Mountains on the east and Coastal Mountains on the west and is situated 180 miles north of Los Angeles and 200 miles south of San Francisco. State Route 99, a major northsouth corridor in the state, provides direct access to Los Angeles and Sacramento. State Highway 198 provides an east to west corridor between Sequoia and Kings Canyon National Parks and Interstate 5 in Fresno County.

The characteristics that make the Valley the state's top-performing agricultural region and a beautiful place to live also create conditions for forming and trapping air pollution. Surrounding mountains, stagnant weather patterns, hot summers and foggy winters make the formation of air pollution in the Valley inevitable and prevent air pollutants from dispersing. In addition to local pollution created from industry and agriculture, air quality in the San Joaquin Valley is influenced by transported air pollution from the other areas of the state.

The adoption of plug-in electric vehicles (PEVs) is a key strategy to achieving reduced emissions and helping not only Tulare County but also the entire San Joaquin Valley attain air quality goals and clean up the air. However, achieving high enough penetration of PEVs requires an expanded electric vehicle charging network to meet charging needs. Cities in Tulare County can be a catalyst for increasing PEV adoption by providing the essential components to accelerate this adoption.

Tulare County is also home to a significant percentage of Disadvantaged Communities (DACs) which are disproportionately affected by many sources of pollution and where people are often especially vulnerable to pollution's effects. DACs are determined by not only the cumulative impacts of all sources of pollution in a geographic area, but also populations who are especially sensitive to pollution's effects, such as children, people with asthma, and socioeconomically disadvantaged residents. Vehicle electrification efforts, especially those which specifically target DACs and make electric vehicles available to all, are crucial to helping the region achieve environmental justice for its residents, restoring, protecting and improving the environment to ultimately ensure the health of its people, the environment and the economy.

With funding from a CalTrans Sustainable Transportation Planning Grant, the Tulare County Association of Governments (TCAG) commissioned Willdan to conduct an Electric Vehicle Implementation Study (EVIS) to provide a usable guide for local jurisdictions to support electric vehicle use and expand publicly available electric vehicle charging infrastructure in Tulare County. Built upon the planning efforts originally conducted in the [2014 San Joaquin Valley Plug-In Vehicle Readiness Plan](#), this EVIS assesses where local jurisdictions in Tulare County are currently in their EV infrastructure journey. This report identifies case studies on potential EV charging sites within the county, barriers to implementation, opportunities and best practices to consider to increase EV adoption and charging infrastructure rollout in the region, and sources of funding to be considered to help offset the cost of electric vehicle charging stations. This report is not meant to be a complete primer on EVs, but a 2019 Tulare County-specific companion document to both the 2014 San Joaquin Valley PEV Readiness Plan as well as other references sighted within. Once adopted, the Tulare County EVIS will help implement the goals of the County's Sustainable Communities Strategy by supporting the implementation of alternative fueling for surface transportation.



Introduction

This report provides an analysis of recommended locations and cost of EV charger implementation (case studies); a barriers and opportunity section, with best practices for EV charger implementation; and a funding matrix for EV charging stations. The case studies highlight twelve sites to be considered for EV charger implementation throughout Tulare County. Willdan explored sites based on initial stakeholder interviews and preliminary research on existing EV charging stations.

Willdan reached out to various key stakeholders in Tulare County and developed a list of potential sites to be visited and evaluated. Interviews were held with stakeholders from Self Help Enterprises (Senior Community Development Specialist, Director of Asset Management and Senior Asset Management Specialist), City (i.e. city managers, General Service Agency directors, city engineers, transit managers) and County representatives (Resource Management Agency Director, Assistant Director of Planning, General Services Director)¹.

The sites chosen included six private sites and six public sites, comprising of retail, workplace and MUD parking areas. All sites are open to the public, ADA compliant and have parking lot lighting for evening accessibility. During our initial site analysis, we excluded sites due to proximity to existing chargers; remoteness or lack of nearby stores; and/or distance to electrical tie-ins. Since, initial feedback from stakeholders mentioned cost as a major barrier to EVSE installation and EV adoption, we focused of our site analysis and recommendations to prioritize minimizing installation cost. Our aim was to create a comprehensive guide to facilitate EVSE implementation in the near future and fuel long-term expansion of the existing EV charging network across Tulare County.

Table 1 - Final Site Selection for EV Charger Implementation

| City | Suggested Site | Address | Charger Station | Property Type (Private v City/County Owned) |
|------------------|-----------------------------------|---|-----------------|---|
| Visalia | Visalia Mall | 2031 S Mooney Blvd, Visalia, CA 93277 | Level 2/3 | Private |
| Visalia | Goshen Village II | 30940 Road 72, Goshen, CA | Level 2 | Private; MUD, DAC |
| Visalia (County) | Tulare County Superior Courthouse | 221 S Mooney Blvd, Visalia, CA 93291 | Level 2 | Public (County); Workplace |
| Tulare | Tulare Public Library | 475 N M St, Tulare, CA 93274 | Level 2 | Public (City) |
| Porterville | Downtown Parking Lot | E of 2 nd Street, between E Garden Ave & Olive Ave | Level 2 | Public (City) |
| Porterville | Target | 1363 W Henderson Ave, Porterville, CA 93257 | Level 2 | Private |
| Lindsay | Lindsay Branch Library | 157 N Mirage Ave, Lindsay, CA 93247 | Level 2 | Public (City) |

¹ The contact lead list and the case study site contacts are included as Appendix A.



| | | | | |
|--------------|------------------|--|---------|---------------|
| Lindsay | Olivewood Plaza | 199-210, #062, Lindsay, CA 93247 | Level 2 | Private |
| Dinuba | Transit Center | 180 E Merced St, Dinuba, CA 93618 | Level 2 | Public (City) |
| Farmersville | Rest Stop | 452 Avenue 295, Farmersville, CA 93223 | Level 3 | Private |
| Exeter | Shopping Plaza | W Visalia Rd and N Belmont Rd | Level 2 | Private |
| Woodlake | Community Center | 145 N Magnolia Street | Level 3 | Public (City) |

The detailed case studies below are presented in a way which gives the reader a complete snapshot of the study performed and associated details. Each City's case study includes the following information:

- A brief description of the City and general EV awareness/usage trends
- A map of the City is shown with existing EV chargers, potential sites considered and selected site(s) for the case study
- Individual site analysis details include potential EV Charger Locations, recommended EV charging spots, and other relevant EVSE placement criteria, such as tie-in to electrical infrastructure. The locations suggested for EV charger installation were chosen based on the existing disabled person parking space placement; location of electrical tie-in; and proximity to softscape² to minimize installation costs.
- Barriers and opportunities for each city provides reference to both the barriers and opportunities section at the end of the case study section and the entire barriers and opportunities section of this report which will explain in detail observed barriers and best practices to EV implementation in Tulare County.
- Cost and Funding Opportunities which estimates potential incentives for each proposed install as well as provides a low/medium/high estimate of EV charger installation costs in each location.

At the end of the Case Study section a summary table is provided for relevant:

- Summary of Barriers for EV Charger installation in Tulare County
- Summary of Best Practices to help Tulare County overcome barriers to EV Charger installation.

² Softscape is landscaping that can include soil, plants, flower beds, trees; as opposed to hardscape, which is costlier to trench for EV charger implementation purposes.



Case Studies in Tulare County

City of Visalia – Goshen Village II, Visalia Mall and Tulare County Superior Courthouse

The city of Visalia has a population of 133,800³ and is the largest city in Tulare County. Visalia has 18 existing EV charging stations⁴, with 10 on public property and 8 on privately owned sites. The initial perception of EV adoption city-wide, according to stakeholders is relatively low, but there has been an increase in the past year. Some city personnel own EVs, but very few EVs were seen driving around the city. Despite low adoption by residents, there is significant interest in implementing EV charging stations by city personnel.

The eight suggested potential sites included three publicly owned properties (Tulare County Superior Court, Visalia Parking Structure and Parking Garage) and six privately owned sites. There was an understanding of EVs at the city level, but community outreach on EV and EV charger education had not taken place.

We reached out to owners of privately-owned stores in the city to gauge interest in EV charger implementation at their sites but were only able to speak to the general manager at Visalia Mall.

City of Visalia

- Population: 133,800
- City handles EV charger permitting
- Point of Contact: Mario Cifuentez, General Service Agency Director and Paul Bernal, City Planner
- Site selection: Goshen Village II, Visalia Mall, Tulare County Superior Courthouse

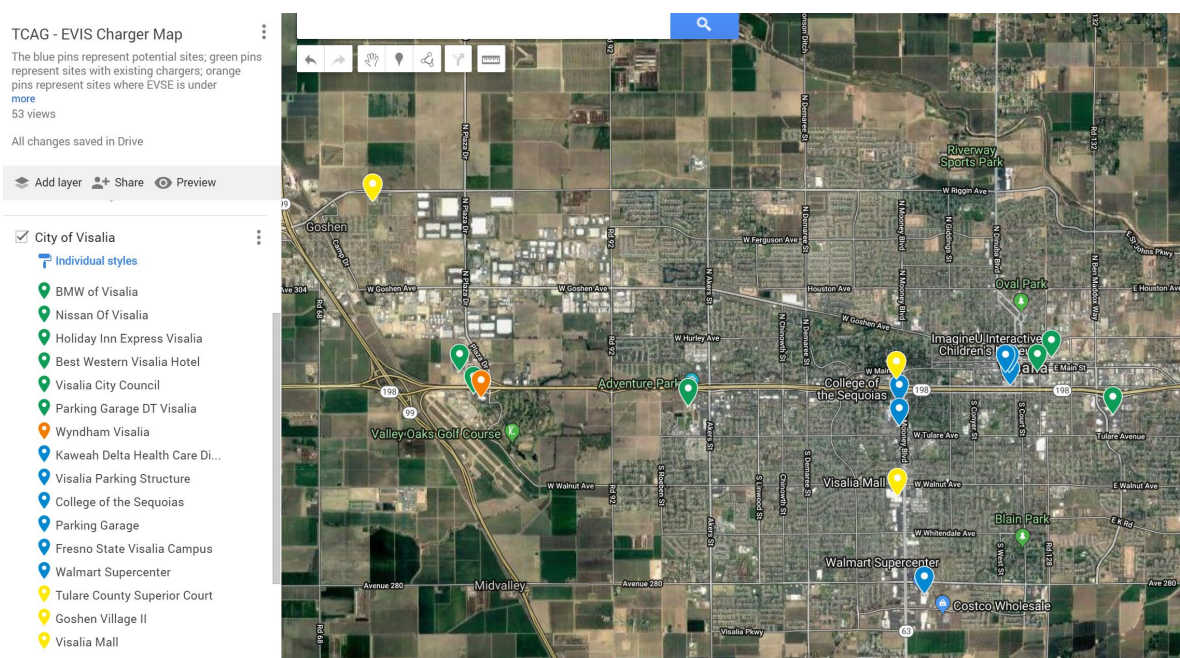


Figure 1 - EV Charger Map of Visalia⁵

³ Data reflects population estimates from July 1, 2018 estimates provided by the US Census Bureau:

<https://www.census.gov/quickfacts/tularecitycalifornia>

⁴ EV charging station counts were obtained from combining [PlugShare](#), [ChargePoint](#) and Stakeholder input.

⁵ Green pins are locations of existing EV chargers; blue pins are locations that were suggested by stakeholders; orange pin is site where EVSE is under construction; the yellow pin is the selected site location.

Site Analysis: Goshen Village II (Visalia)

We met with Self Help Enterprises (S.H.E.) stakeholders to discuss which of their MUD rental communities would be a best fit for installing EV chargers. The point of contact for this site is Andrea Barnier, Senior Asset Management. In Visalia, the S.H.E. rental community, *Highland Gardens*, participates in a car sharing program, called MioCar.⁶ The program has plans for expansion according to Mobility Development Chief Operating Officer, Rachel Heckl and with the assistance of S.H.E., we recommend expanding the MioCar program to *Goshen Village II*. Using our EV Readiness Checklist⁷ and Siting Guidelines⁸, we evaluated the location (Figure 2). The Goshen Village II is near Goshen Village apartments, so it would serve two communities (useful for MioCar purposes). It is ADA compliant and has solar PV already installed, which should help manage increases in load due to EV charging.



Figure 2 - Aerial photograph of Goshen Village II: 30940 Road 72, Goshen, CA

The locations suggested for EV charger implementation were chosen based on the existing disabled person parking space placement. We are suggesting two level-2 chargers to be placed adjacent to existing ADA and van accessible spots, taking up a total of four parking spots (Figure 3). The charger placement is also near an electrical tie-in and accessible softscape. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

⁶ San Joaquin Valley's Carshare program is a membership-based carsharing service providing 24/7 access to vehicles on an hour or daily basis: <https://miocar.org/>.

⁷ See Appendix B for EV Readiness Checklist Q&A.

⁸ The Site Selection Guidelines can be found in the Barriers and Opportunities Section (Table 41).

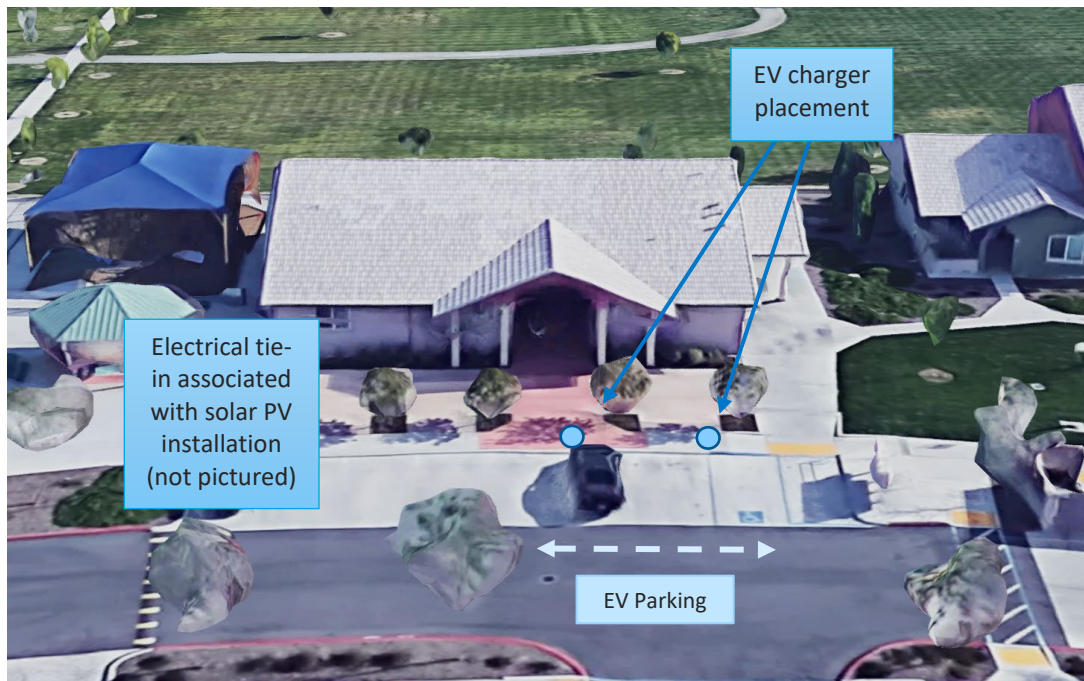


Figure 3 - Site location for EV charger placement – Goshen Village II

Site Analysis: Visalia Mall

The point of contact for Visalia mall is Rick Feder, General Manager, who was enthusiastic about bringing EV charging to the mall because “it’s good for the environment and [his] customers”. He expressed interest in installing EV chargers at four potential locations throughout the parking lots; three locations near mall entrances and two locations in the parking garage (Figure 4). Using our Siting Guidelines and EV Readiness Checklist, we evaluated the Visalia Mall. This site has various retail and food stores and has high volume of visitors, with an average stay of 35-45 minutes. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site. The lots closest to electrical infrastructure are the ones near S Sallee Street, W parking lot (Figure 5) and Walnut Ave, N parking lot.

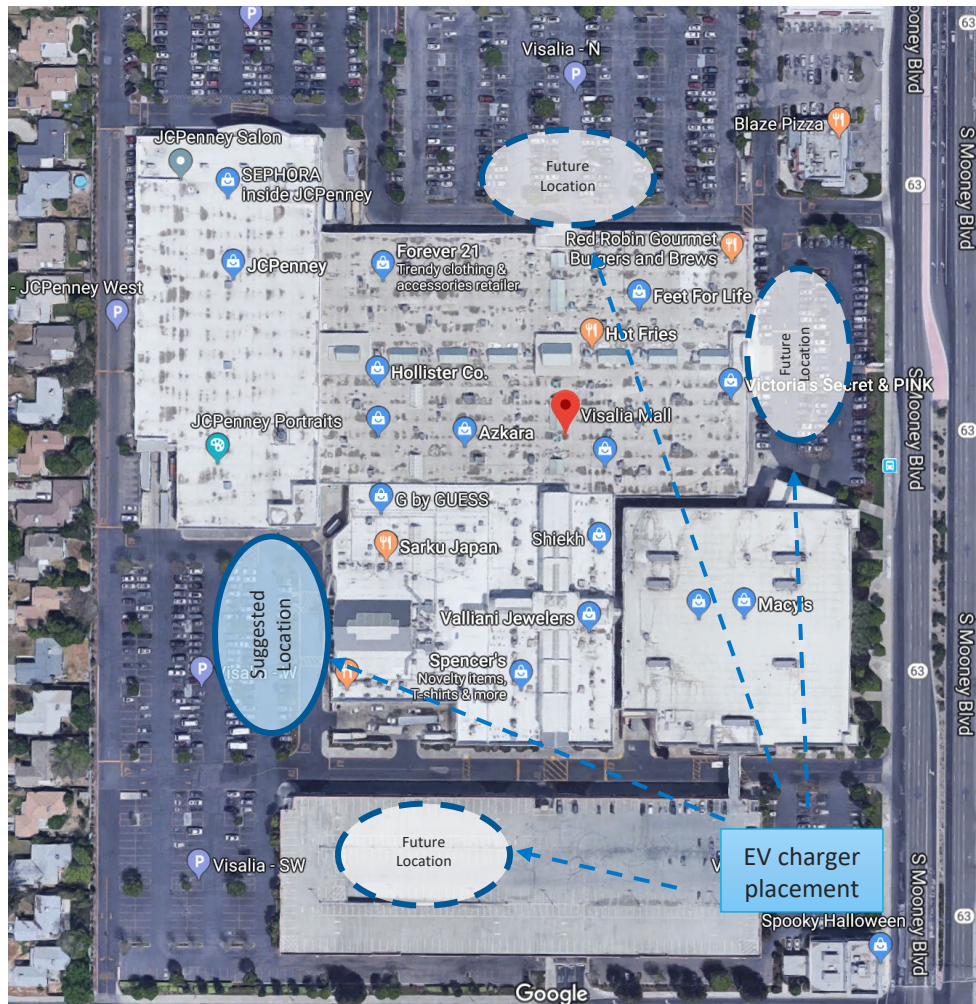


Figure 4 - Aerial photograph of Visalia Mall: 2031 S Mooney Blvd, Visalia, CA 93277

In the interest of leveraging economies of scale, with multiple charger installations per location, we are suggesting placing one level 3 (L3) DC fast charger and five level 2 (L2) chargers in the same west parking lot near JC Penny. By installing EV chargers in the west parking lot, the site can leverage significant amounts of softscape and existing electrical tie-ins to reduce the overall cost of an initial EVSE installation. This lot is publicly accessible 24 hours a day and there is lighting on overnight. When the time comes to install additional EV chargers, the mall can expand future installations near the other three entrances and in the parking garage.



Figure 5 - Site location for EV charger placement – Visalia Mall (W Parking site)

Site Analysis: Tulare County Superior Courthouse (Visalia)

We selected the Tulare County Superior Courthouse due to the high traffic volume to this site, according to stakeholders. The point of contact for this site is Brooke Sisk, Assistant GSA Director. Using our EV Readiness Checklist and Siting Guidelines, we evaluated the location and chose placement of EV chargers near the entrance (Figure 6). There is a restaurant & bakery in 5 min walking distance, but this site would mainly serve those working at the courthouse, as well as those visiting. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site. This lot also has solar carports (not pictured) which generate energy to offset the load increases from EV charging.

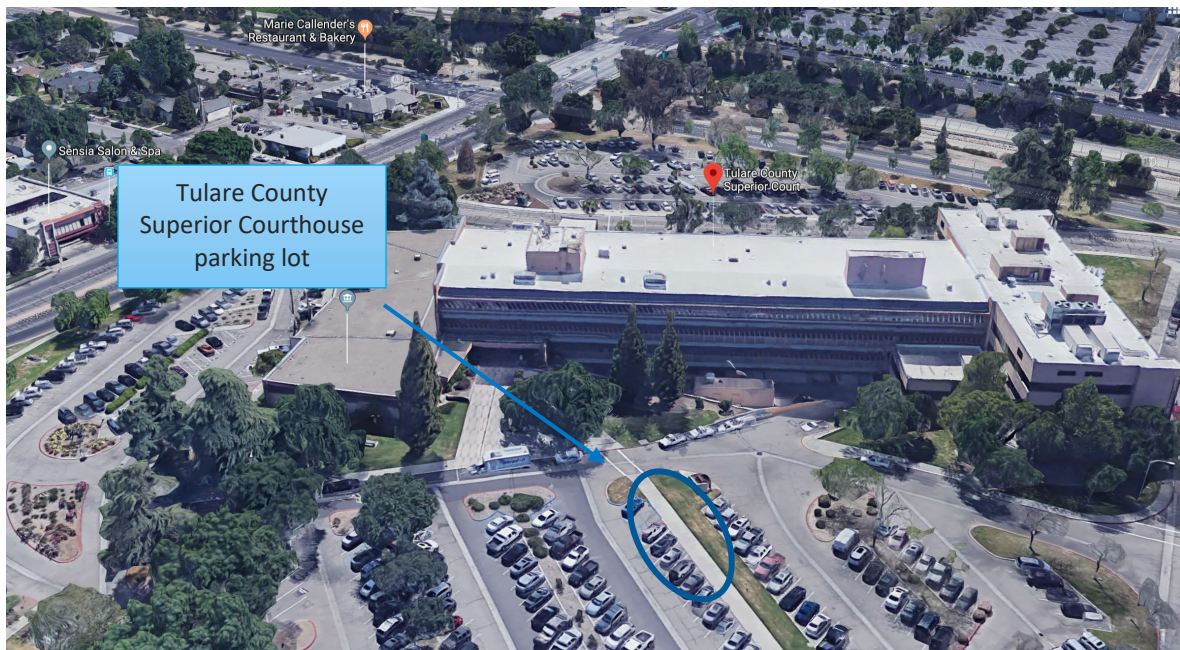


Figure 6 - Aerial photograph of Tulare County Superior Courthouse: 221 S Mooney Blvd, Visalia, CA 93291

We are suggesting two level-2 chargers to be placed in the median between parking rows, taking up a total of 4 parking spots (Figure 7), including one ADA accessible spot. The charger placement is near accessible softscape. This lot is publicly accessible 24 hours a day and there is lighting on overnight under the solar carports.

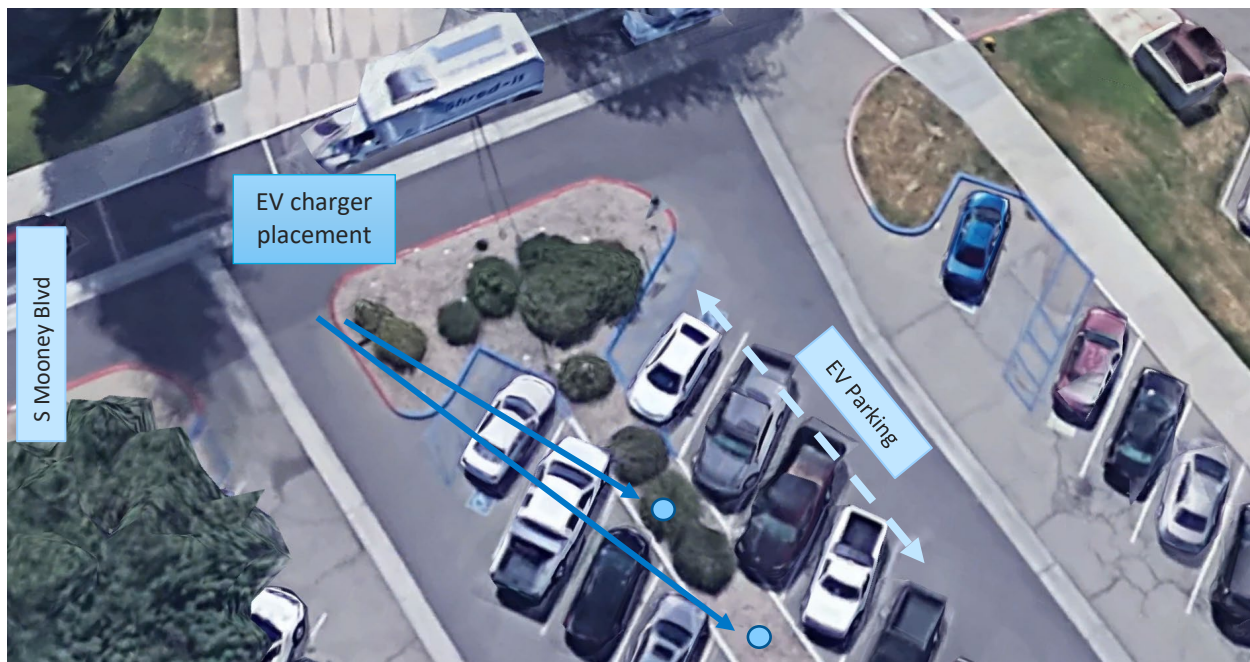


Figure 7 - Site location for EV charger placement – Tulare County Superior Courthouse

Barriers and Opportunities:

Visalia has a large DAC and low-income population, making it a challenge to invest in EVSE infrastructure. At the end of the Case Studies section we included two tables that summarize the similar barriers that were identified across Tulare County (Table 24). We also highlight opportunities and best practices to overcome the barriers associated with EVSE installation in Table 25. A detailed description of all barriers, opportunities and best practices can be found in the Barriers and Opportunities section on p.45.

Cost and Funding Opportunities:

Willdan analyzed available and eligible incentives and suggests stakeholders apply for the Charge Up! Program from San Joaquin Valley Air Pollution Control District. This incentive is stackable, and we encourage stakeholders to pursue applications for additional incentives (i.e. CMAQ⁹) if applicable. Based on Charge Up! requirements¹⁰, for Goshen Village II and Tulare County Superior Courthouse, we created an estimated cost and funding analysis to include two scenarios (low/mid and high) with the dual port ChargePoint L2 CT4021 – GW1 Gateway Unit¹¹ (CP

⁹ See Funding Table 45 for list of incentives and funding options.

¹⁰ EV Requirements are on page 2: http://www.valleyair.org/grants/documents/chargeup/CU!_Guidelines.pdf

¹¹ [ChargePoint CT4021 – GW1 Gateway Unit](#) is a commercial electric vehicle charging station with an 18-foot retractable cable instead of the 23-foot.

CT4021) and the ChargePoint L2 CT4025-GW1 Gateway¹² (CP CT4025). The tables indicate the number of chargers that were evaluated per site.

The tables below show a breakdown of the cost differentials for the purchase of a single Level-2 charger (Table 2) and two Level-2 chargers (Table 3) at Visalia's Goshen Village II. The low cost (recommended) and mid cost option evaluates the cost of the CP CT4021, and the high cost option evaluates the CP CT4025. The low cost option also applies the (SJVAPCD) incentive.

Table 2 – Estimated Cost and Funding Analysis (Single L2 charger): Goshen Village II¹³

| | Low Cost | Mid Cost | High Cost |
|----------------------------------|----------|----------|-----------|
| Total Unit Cost ¹⁴ | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost ¹⁵ | \$3,533 | \$4,533 | \$5,533 |
| O&M Costs ¹⁶ | \$300 | \$650 | \$1,020 |
| Incentives ¹⁷ | \$6,000 | - | - |
| Total cost to City ¹⁸ | \$5,043 | \$12,393 | \$14,763 |

Table 3 - Estimated Cost and Funding Analysis (Two L2 chargers): Goshen Village II

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$14,420 | \$14,420 | \$16,420 |
| Installation Cost | \$6,691 | \$8,691 | \$10,691 |
| O&M Costs | \$600 | \$1,300 | \$2,040 |
| Incentives | \$12,000 | | |
| Total cost to City | \$9,711 | \$24,411 | \$29,151 |

¹²[ChargePoint CT4025 - GW1 Gateway Unit](#) is a commercial electric vehicle charging station. The unit is a dual port, bollard mount (self-supporting pedestal mount) with a 23-foot retractable cable with a power output of 7.2kW (AC).

¹³ Assumptions made for the cost analysis are in Appendix C

¹⁴Ibid.

¹⁵Ibid.

¹⁶Ibid.

¹⁷ [SJVAPCD Charge Up](#) is an EVSE charger incentive program that reduces the total cost of the unit and installation of the charger. The main eligibility criteria for the charger is that it must be [SAE J1772](#) compliant, must be [UL Listed](#) and must be [OCCP compliant](#).

¹⁸ The low cost assumes the incentive would be applied and the CT4021 is selected; the mid cost would be selecting the same unit (CT4021) without the incentives; and the high cost would be selecting the CT4025 charger (with 23ft cable vs 18ft).



The tables below show a breakdown of the cost differentials for the purchase of a single Level 3 ChargePoint Express 250 (60kW DCFC) charger¹⁹ (Table 4) and five Level 2 chargers (Table 5) at Visalia Mall.

Table 4 - Estimated Cost and Funding Analysis (Single L3 charger): Visalia Mall

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$35,800 | \$35,800 | \$35,800 |
| Installation Cost | \$17,125 | \$25,925 | \$34,725 |
| O&M Costs | \$800 | \$1,600 | \$2,900 |
| Incentives | \$25,000 | | |
| Total cost to City | \$28,725 | \$63,325 | \$73,425 |

Table 5 - Estimated Cost and Funding Analysis (Five L2 charger): Visalia Mall

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$36,050 | \$36,050 | \$41,050 |
| Installation Cost | \$22,665 | \$30,665 | \$38,665 |
| O&M Costs | \$1,500 | \$3,250 | \$5,100 |
| Incentives | \$30,000 | | |
| Total cost to City | \$30,215 | \$69,965 | \$84,815 |

The tables below show a breakdown of the cost differentials for the purchase of a single Level-2 charger (Table 6) and two Level-2 chargers (Table 6) at Tulare County Superior Courthouse (Table 7). The low cost and mid cost option evaluates the cost of the CP CT4021, and the high cost option evaluates the CP CT4025. The low cost option also applies the (SJVAPCD) incentive. The high relative costs for installation of Level-2 chargers at the County Courthouse can be attributed to the significant amounts of estimated trenching necessary to lay conduit and connect the EV chargers to power.

Table 6 - Estimated Cost and Funding Analysis (Single L2 charger): Tulare County Superior Courthouse (Visalia)

| | Low Cost | Mid Cost | High Cost |
|-------------------|----------|----------|-----------|
| Total Unit Cost | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost | \$21,929 | \$22,929 | \$23,929 |
| O&M Cost | \$300 | \$650 | \$1,020 |
| Incentives | \$6,000 | - | - |

¹⁹ [ChargePoint Express 250 \(60kW DCFC\)](#) charger is a commercial electric vehicle fast charger (Level 3) with a 12-foot retractable cable.



| | | | |
|--------------------|----------|----------|----------|
| Total cost to City | \$23,439 | \$30,789 | \$33,159 |
|--------------------|----------|----------|----------|

Table 7 - Estimated Cost and Funding Analysis (Two L2 chargers): Tulare County Superior Courthouse (Visalia)

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$14,420 | \$14,420 | \$16,420 |
| Installation Cost | \$24,495 | \$26,495 | \$28,495 |
| O&M Costs | \$600 | \$1,300 | \$2,040 |
| Incentives | \$12,000 | - | - |
| Total cost to City | \$27,515 | \$42,215 | \$46,955 |

City of Tulare – Tulare Public Library

The city of Tulare has a population of 64,475²⁰ and is the second largest city in Tulare County. Tulare has 4 existing EV charging stations, with 2 on public property and 2 on privately owned sites. The initial perception of EV adoption city-wide is low. Stakeholders mentioned very few EVs were seen driving around but are interested in implementing EV charging stations.

The suggested potential sites included three publicly owned properties (Tulare Library, City Hall and Transit Center) and four privately owned locations (Tulare Outlets, Love's Travel Spot, Heritage Center and the Swap Meet). There was a general understanding of EVs at the city level, but community outreach on EV and EV charger education has not taken place. They have a participating Walmart in the Electrify America program²¹, that has six charging stations (mix of Level 2 and Level 3) finishing construction in the fall of 2019.

We reached out to owners of privately-owned stores in the city to gauge interest in EV charger implementation at their sites but were unable to reach a person with decision making authority or they were not interested at this time due to perceived costs and time.

City of Tulare

- Population: 64,475
- Western Tulare is mostly DACs with higher number of MUDs
- City handles EV charger permitting
- Point of Contact: Michael Miller, City Engineer
- Site selection: Tulare Public Library

²⁰ Data reflects population estimates from July 1, 2018 estimates provided by the US Census Bureau: <https://www.census.gov/quickfacts/tularecitycalifornia>

²¹ Electrify America and Walmart have partnered to install chargers at Walmart's throughout the US: <https://corporate.walmart.com/newsroom/2019/06/06/electrify-america-walmart-announce-completion-of-over-120-charging-stations-at-walmart-stores-nationwide-with-plans-for-further-expansion>



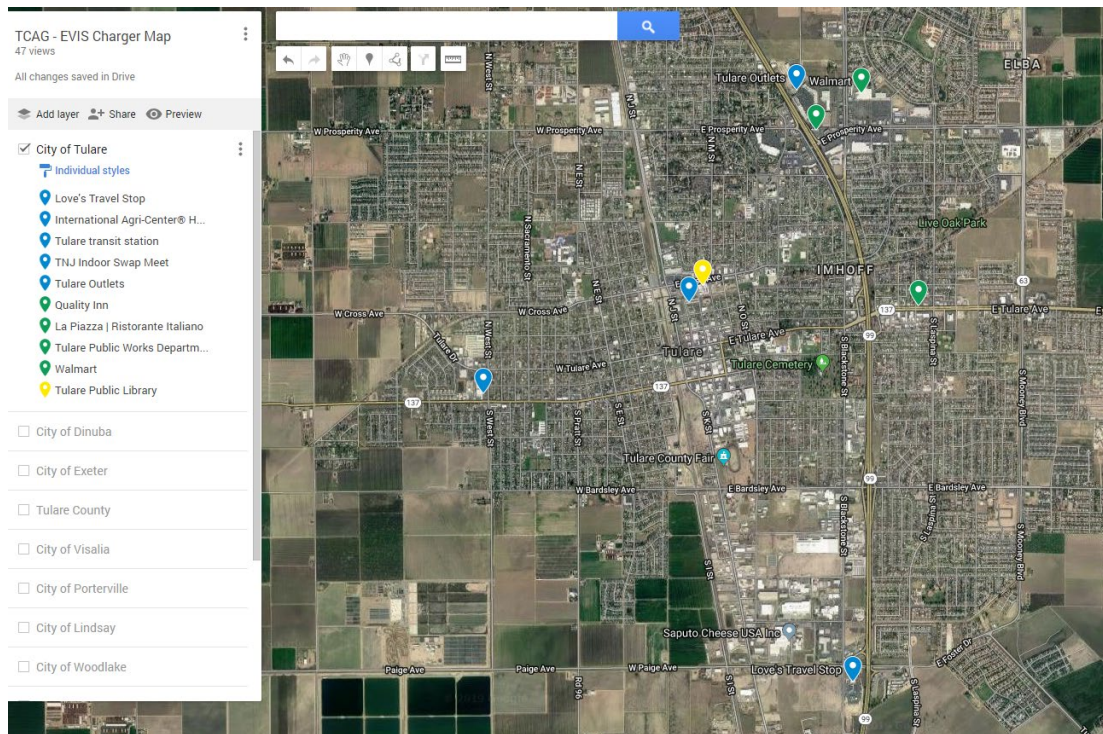


Figure 8 - EV Charger Map of Tulare²²

Site Analysis: Tulare Public Library

We met with Steve Bonville, GSA Director and Mike Miller, City Engineer to discuss initial site selections. There was significant interest in expanding EVSE infrastructure and feedback on existing EV charging stations that were Using our EV Readiness Checklist²³ and Siting Guidelines²⁴, we visited the Library and evaluated the location. The Library is in 2-5 min walking distance to various retail and food stores. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site. There is also construction in the adjacent lot that will be developed into additional shopping stores.

²² Green pins are locations of existing EV chargers; blue pins are locations that were suggested by stakeholders; the yellow pin is the selected site location.

²³ See Appendix B for EV Readiness Checklist Q&A.

²⁴ The Site Selection Guidelines can be found in the Barriers and Opportunities Section (Table 41).



Figure 9 - Aerial photograph of Tulare Public Library: 475 N M St, Tulare, CA 93274

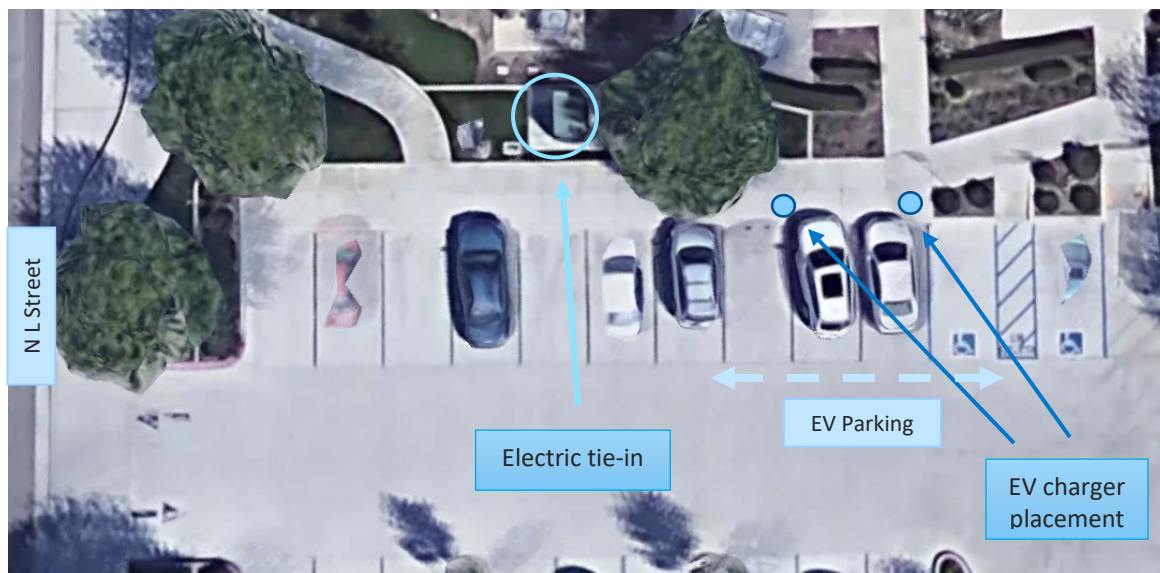


Figure 10 - Site location for EV charger placement - Tulare

The two locations suggested for EV charger implementation were chosen based on the existing disabled person parking space placement. We are suggesting two level-2 chargers to be placed adjacent to the existing ADA spots, taking up a total of four parking spots adjacent to N L Street (Figure 10). The charger placement is also in close proximity to the electrical tie-in and accessible softscape²⁵. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

Barriers and Opportunities to EVSE Implementation:

At the end of the Case Studies section we included two tables that summarize the similar barriers that were identified across Tulare County (Table 24). We also highlight opportunities and best practices to overcome the

²⁵ Softscape is landscaping that can include soil, plants, flower beds, trees; as opposed to hardscape, which is costlier to trench for EV charger implementation purposes.

barriers associated with EVSE installation in Table 25. A detailed description of all barriers, opportunities and best practices can be found in the Barriers and Opportunities section on p. 45.

Cost and Funding Opportunities:

Willdan analyzed available and eligible incentives and suggest stakeholders apply for the Charge Up! Program from San Joaquin Valley Air Pollution Control District. This incentive is stackable, and we encourage stakeholders to pursue applications for additional incentives (i.e. CMAQ²⁶) if applicable. Based on Charge Up! requirements²⁷ we created an estimated cost and funding analysis to include two scenarios (low/mid and high) with the dual port level 2 (L2) ChargePoint CT4021 – GW1 Gateway Unit²⁸ (CP CT4021) and the L2 ChargePoint CT4025-GW1 Gateway²⁹ (CP CT4025).

The tables below show a breakdown of the cost differentials for the purchase of a single charger (Table 8) and two chargers (Table 9). The low cost and mid cost option assumes the CP CT4021 charger is selected and the high cost option assumes the CP CT4025 is selected. The low cost option also applies the (SJVAPCD) incentive.

Table 8 – Estimated Cost Analysis (Single L2 charger): Tulare Library³⁰

| | Low Cost | Mid Cost | High Cost |
|----------------------------------|----------|----------|-----------|
| Total Unit Cost ³¹ | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost ³² | \$4,248 | \$5,248 | \$6,248 |
| O&M Costs ³³ | \$300 | \$650 | \$1,020 |
| Incentives ³⁴ | \$6,000 | - | - |
| Total cost to City ³⁵ | \$5,758 | \$13,108 | \$15,478 |

²⁶ See Funding Table 45 for list of incentives and funding options.

²⁷ EV Requirements are on page 2: http://www.valleyair.org/grants/documents/chargeup/CU!_Guidelines.pdf

²⁸ [ChargePoint CT4021 – GW1 Gateway Unit](#) is a commercial electric vehicle charging station with an 18-foot retractable cable instead of the 23-foot.

²⁹ [ChargePoint CT4025 - GW1 Gateway Unit](#) is a commercial electric vehicle charging station. The unit is a dual port, bollard mount (self-supporting pedestal mount) with a 23-foot retractable cable with a power output of 7.2kW (AC).

³⁰ Assumptions made for the cost analysis are in Appendix C.

³¹ Ibid.

³² Ibid.

³³ Ibid.

³⁴ [SJVAPCD Charge Up](#) is an EVSE charger incentive program that reduces the total cost of the unit and installation of the charger.

³⁵ The low cost assumes the incentive would be applied and the CT4021 is selected; the mid cost would be selecting the same unit (CT4021) without the incentives; and the high cost would be selecting the CT4025 charger (with 23ft cable vs 18ft).



Table 9 - Estimated Cost Analysis (Two L2 chargers): Tulare Library

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$14,420 | \$14,420 | \$16,420 |
| Installation Cost | \$7,645 | \$9,645 | \$11,645 |
| O&M Costs | \$600 | \$1,300 | \$2,040 |
| Incentives | \$12,000 | - | - |
| Total cost to City | \$10,665 | \$25,365 | \$30,105 |

City of Porterville – Downtown Parking Lot & Target Parking Lot

The city of Porterville has a population of 59,145³⁶ and is the third largest city in Tulare County. Porterville has seven existing EV charging stations³⁷ and six currently under construction, with three on public property and four on privately owned sites. The initial perception of EV city-wide is relatively low, according to stakeholders. City personnel have been seen using EVs, but very few EVs were seen driving around the city. Despite low adoption, there is significant interest in implementing EV charging stations and steering city vehicles to zero-emission vehicles (ZEVs).

The Transit Division has spearheaded early adoption of EV infrastructure and in 2014 pursued funding to begin electrification of its fleet to ZEVs. In 2016, they were awarded funding by SCEs Charge Ready Program for six Level-2 public charging stations and a separate award by Air Quality Improvement Program and Low Carbon Transportation Greenhouse Gas Reduction Fund Investment to purchase 10 zero-emission busses and charging stations.

The suggested sites for EV charger installation included eight locations in Porterville (South County Justice Center, Sierra View Medical Center, Porterville Development Center, Riverwalk Marketplace, Porterville Fair Grounds, Holiday Inn, Walmart, Target and Downtown Parking area). We reached out to owners of privately-owned stores in the city to gauge interest in EV charger implementation at their sites but were unable to reach a person with decision making authority or they were not interested at this time due to perceived costs and time.

City of Porterville

- Population: 59,145
- Majority of city is considered DAC
- City handles EV charger permitting
- Point of Contact: Mike Reed, Public Works Director
- Site selection: Downtown Parking Lot & Target Parking Lot

³⁶ Data reflects population estimates from July 1, 2018 estimates provided by the US Census Bureau: <https://www.census.gov/quickfacts/tularecitycalifornia>

³⁷ EV charging station counts were obtained from combining [PlugShare](#), [ChargePoint](#) and Stakeholder input.



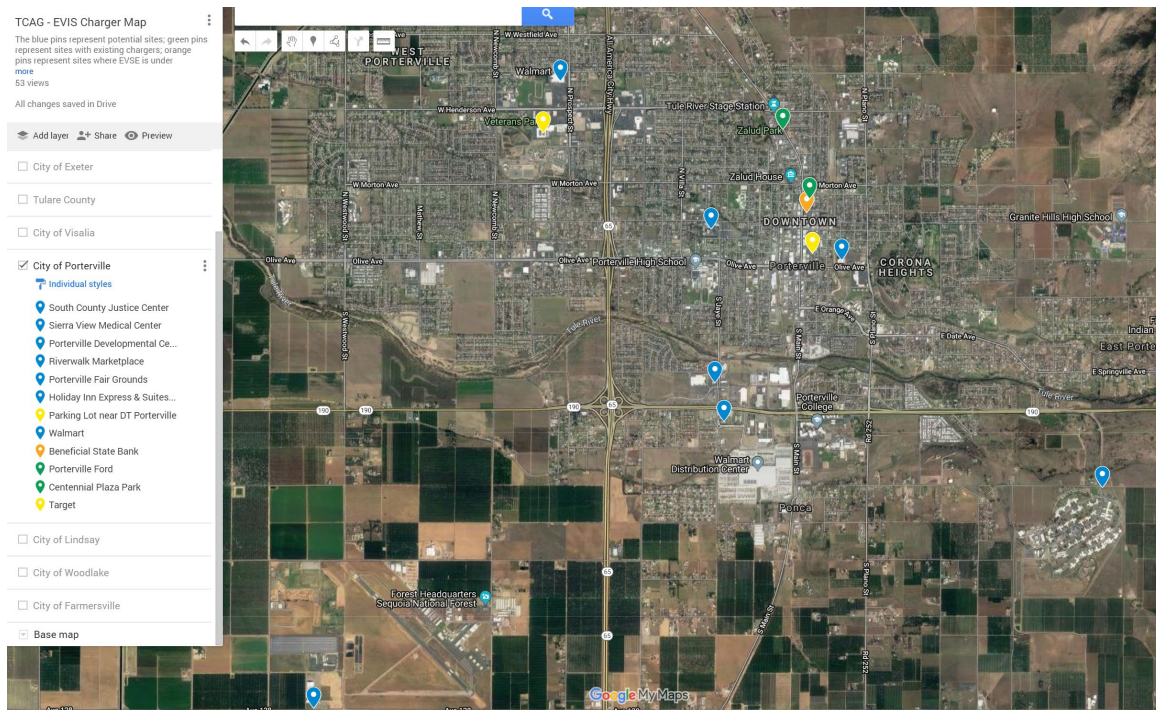


Figure 11 - EV Charger Map of Porterville³⁸

Site Analysis: Downtown Parking Lot (Porterville)

We conducted a site analysis using our EV Readiness Checklist³⁹ and Siting Guidelines⁴⁰, noting nearby retail stores and shopping. This location was selected based on stakeholder feedback on heavy traffic to downtown shops. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site.

³⁸ Green pins are locations of existing EV chargers; blue pins are locations that were suggested by stakeholders; the yellow pin is the selected site location.

³⁹ See Appendix B for EV Readiness Checklist Q&A.

⁴⁰ The Site Selection Guidelines can be found in the Barriers and Opportunities Section (Table 41).



Figure 12 - Aerial photograph of Downtown Parking Lot: E of 2nd Street, between E Garden Ave & Olive Ave

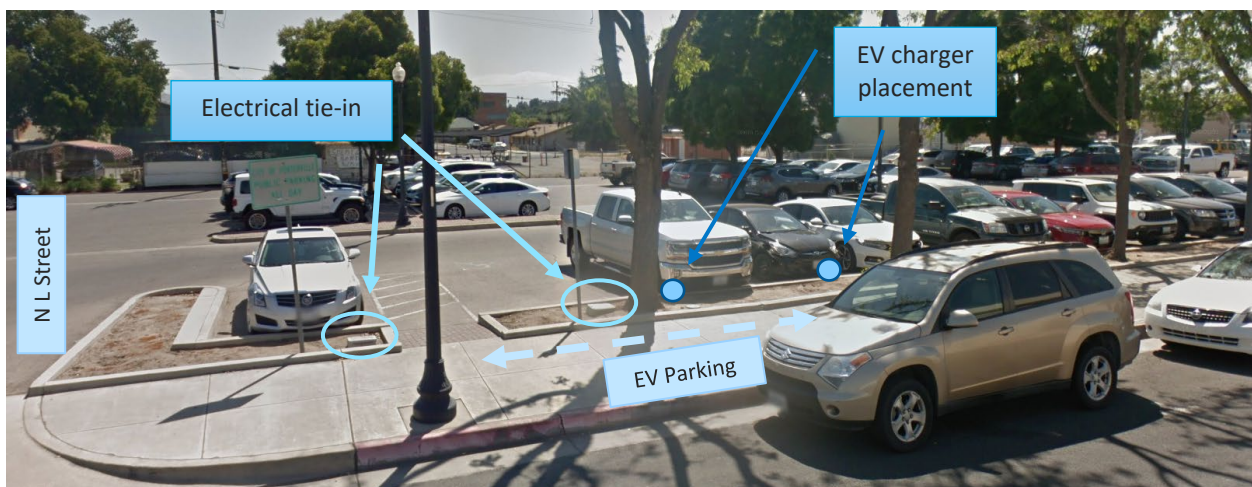


Figure 13 - Site location for EV charger placement – Downtown Parking Lot in Porterville

We recommend two Level-2 chargers to be placed on the surrounding spaces, taking up a total of four parking spots adjacent to N L Street (Figure 17) including one ADA/Van accessible spot. The charger placement is also in close proximity to the electrical tie-ins and accessible softscape⁴¹. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

⁴¹ Softscape is landscaping that can include soil, plants, flower beds, trees; as opposed to hardscape, which is costlier to trench for EV charger implementation purposes.

Site Analysis: Target Parking Lot (Porterville)

We conducted a site analysis using our EV Readiness Checklist⁴² and Siting Guidelines⁴³, noting proximal retail stores and general shopping surrounding the lot. This location was selected based on stakeholder feedback on heavy traffic to this shopping area. We were unable to make contact with the corporate office, who would need to approve the use of the site, but Target is committed to sustainable operations and “minimizing [their] greenhouse gas footprint⁴⁴,” so we encourage continued outreach to their corporate office to encourage EV charger installation. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site.



Figure 14 - Aerial photograph of Target: 1363 W Henderson Ave, Porterville, CA 93257

⁴²See Appendix B for EV Readiness Checklist Q&A.

⁴³ The Site Selection Guidelines can be found in the Barriers and Opportunities Section (Table 41).

⁴⁴ See Target’s “Sustainable Operations” page: <https://corporate.target.com/corporate-responsibility/planet/sustainable-operations>



Figure 15 - Site location for EV charger placement – Target in Porterville

We recommend installing up to five Level-2 chargers to be placed in between rows of parking, taking up a total of 10 parking spots, including two ADA/Van Accessible spots (Figure 20). The charger placement is also in close proximity an electrical vault and accessible softscape⁴⁵. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

Barriers and Opportunities:

At the end of the Case Studies section we included two tables that summarize the similar barriers that were identified across Tulare County (Table 24). We also highlight opportunities and best practices to overcome the barriers associated with EVSE installation in Table 25. A detailed description of all barriers, opportunities and best practices can be found in the Barriers and Opportunities section on p.45.

Cost and Funding Opportunities:

Willdan analyzed available and eligible incentives and suggests stakeholders apply for the Charge Up! Program from San Joaquin Valley Air Pollution Control District. This incentive is stackable, and we encourage stakeholders

⁴⁵ Softscape is landscaping that can include soil, plants, flower beds, trees; as opposed to hardscape, which is costlier to trench for EV charger implementation purposes.

to pursue applications for additional incentives (i.e. CMAQ⁴⁶) if applicable. Based on Charge Up! requirements⁴⁷ we created an estimated cost and funding analysis to include two scenarios (low/mid and high) with the dual port L2 ChargePoint CT4021 – GW1 Gateway Unit⁴⁸ (CP CT4021) and the L2 ChargePoint CT4025-GW1 Gateway⁴⁹ (CP CT4025).

The tables below show a breakdown of the cost differentials for the purchase of a single Level-2 charger (Table 10) and two Level-2 chargers (table) at Porterville’s downtown parking lot (Table 11). The low cost (recommended) and mid cost option assumes the CP CT4021 charger is selected and the high cost option assumes the CP CT4025 is selected. The low cost option also applies the (SJVAPCD) incentive.

Table 10 – Estimated Cost and Funding Analysis (Single L2 charger): Porterville Downtown Parking Lot⁵⁰

| | Low Cost | Mid Cost | High Cost |
|----------------------------------|----------|----------|-----------|
| Total Unit Cost ⁵¹ | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost ⁵² | \$5,830 | \$9,830 | \$13,830 |
| O&M Costs ⁵³ | \$300 | \$650 | \$1,020 |
| Incentives ⁵⁴ | \$6,000 | | |
| Total cost to City ⁵⁵ | \$7,340 | \$17,690 | \$23,060 |

Table 11 – Estimated Cost and Funding Analysis (Two L2 chargers): Porterville Downtown Parking Lot

| | Low Cost | Mid Cost | High Cost |
|-------------------|----------|----------|-----------|
| Total Unit Cost | \$14,420 | \$14,420 | \$16,420 |
| Installation Cost | \$7,870 | \$12,870 | \$17,870 |
| O&M Costs | \$600 | \$1,300 | \$2,040 |
| Incentives | \$12,000 | | |

⁴⁶ See Funding Table 45 for list of incentives and funding options.

⁴⁷ EV Requirements are on page 2: http://www.valleyair.org/grants/documents/chargeup/CU!_Guidelines.pdf

⁴⁸ [ChargePoint CT4021 – GW1 Gateway Unit](#) is a commercial electric vehicle charging station with an 18-foot retractable cable instead of the 23-foot.

⁴⁹ [ChargePoint CT4025 - GW1 Gateway Unit](#) is a commercial electric vehicle charging station. The unit is a dual port, bollard mount (self-supporting pedestal mount) with a 23-foot retractable cable with a power output of 7.2kW (AC).

⁵⁰ Assumptions made for the cost analysis are in Appendix C.

⁵¹ Ibid.

⁵² Ibid.

⁵³ Ibid.

⁵⁴ [SJVAPCD Charge Up](#) is an EVSE charger incentive program that reduces the total cost of the unit and installation of the charger. The main eligibility criteria for the charger is that it must be [SAE J1772](#) compliant, must be [UL Listed](#) and must be [OCCP compliant](#).

⁵⁵ The low cost assumes the incentive would be applied and the CT4021 is selected; the mid cost would be selecting the same unit (CT4021) without the incentives; and the high cost would be selecting the CT4025 charger (with 23ft cable vs 18ft).



| | | | |
|--------------------|----------|----------|----------|
| Total cost to City | \$10,890 | \$28,590 | \$36,330 |
|--------------------|----------|----------|----------|

The tables below show a breakdown of the cost differentials for the purchase of a single Level-2 charger (Table 12) and five L2 chargers (table) at the Porterville Target (Table 13). The low cost and mid cost option assumes the CP CT4021 charger is selected and the high cost option assumes the CP CT4025 is selected. The low cost option also applies the (SJVAPCD) incentive. The high relative costs for installation of Level-2 chargers at the Porterville Target can be attributed to the significant amounts of estimated trenching necessary to lay conduit and connect the EV chargers to power.

Table 12 – Estimated Cost and Funding Analysis (Single L2 charger): Porterville Target

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost | \$22,520 | \$26,520 | \$30,520 |
| O&M Costs | \$300 | \$650 | \$1,020 |
| Incentives | \$6,000 | | |
| Total cost to City | \$24,030 | \$34,380 | \$39,750 |

Table 13 – Estimated Cost and Funding Analysis (Five L2 chargers): Porterville Target

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$36,050 | \$36,050 | \$41,050 |
| Installation Cost | \$34,775 | \$42,775 | \$50,775 |
| O&M Cost | \$1,500 | \$3,250 | \$5,100 |
| Incentives | \$30,000 | | |
| Total cost to City | \$42,325 | \$82,075 | \$96,925 |

City of Dinuba – Transit Parking Lot

The city of Dinuba has a population of 24,034⁵⁶. Dinuba has no previously existing public EV charging stations. The initial perception of EV adoption city-wide is very low. Despite low EV adoption, there is interest in implementing EV charging stations.

The suggested sites included three publicly owned properties (Transit Center, Public Works and Tulare County Superior Court) and three privately owned locations. There was a general understanding of EVs at the city level, but community outreach on EV and EV charger education has not taken place. They have a participating S.H.E. rental community in the MioCar carshare program at Sierra Village.

City of Dinuba

- Population: 24,034
- The majority of the city is considered DAC
- The city outsources EV charger permitting to third parties
- Point of Contact: Ismael Hernandez, Public Works Director
- Site selection: Transit Parking Lot

⁵⁶ Data reflects population estimates from July 1, 2018 estimates provided by the US Census Bureau: <https://www.census.gov/quickfacts/tularecitycalifornia>



We reached out to owners of privately-owned stores in the city to gauge interest in EV charger implementation at their sites but were unable to reach a person with decision making authority or they were not interested at this time due to perceived costs and time.

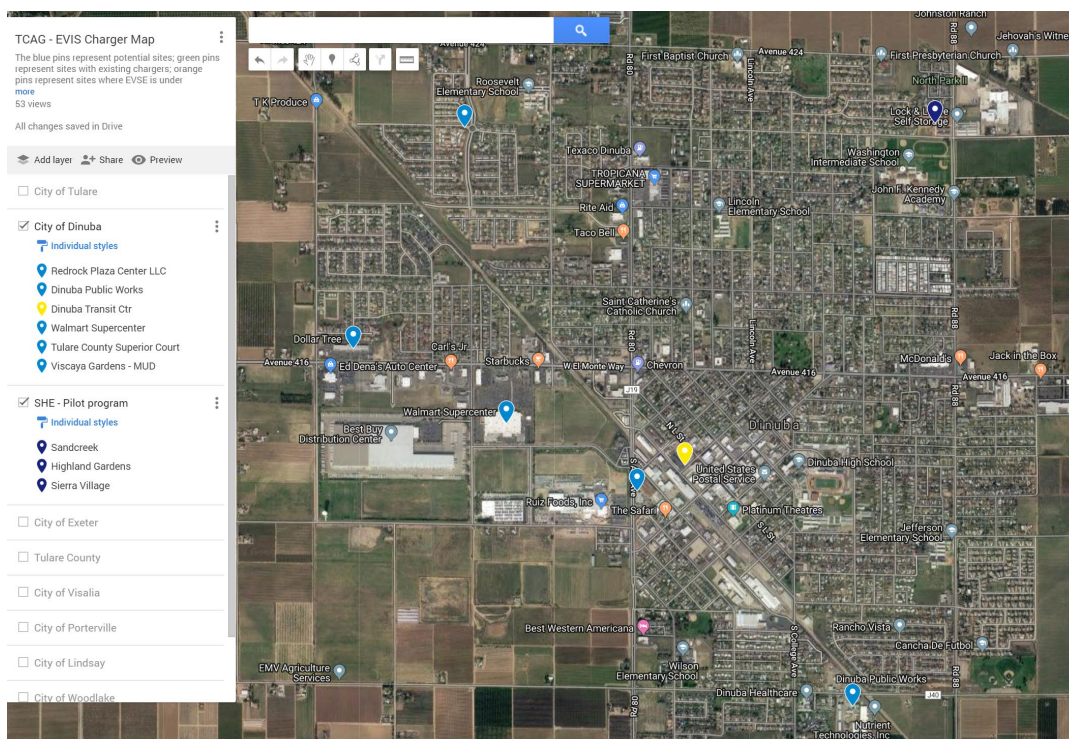


Figure 16 - EV Charger Map of Dinuba⁵⁷

Site Analysis: Transit Parking Lot (Dinuba)

Using our EV Readiness Checklist⁵⁸ and Siting Guidelines⁵⁹, we evaluated the Transit Center parking lot. The transit center was recommended by the Public Works Director as it is city owned and near the Dinuba Chamber of Commerce, California Tacos, Dinuba Pharmacy, Retail Stores and Platinum Theatres. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site. EV Chargers are to be located under solar carport canopies in middle aisle of parking lot (Figure 17).

⁵⁷ Green pins are locations of existing EV chargers; blue pins are locations that were suggested by stakeholders; the yellow pin is the selected site location.

⁵⁸ See Appendix B.

⁵⁹ The Site Selection Guidelines can be found in the Barriers and Opportunities Section (Table 41).

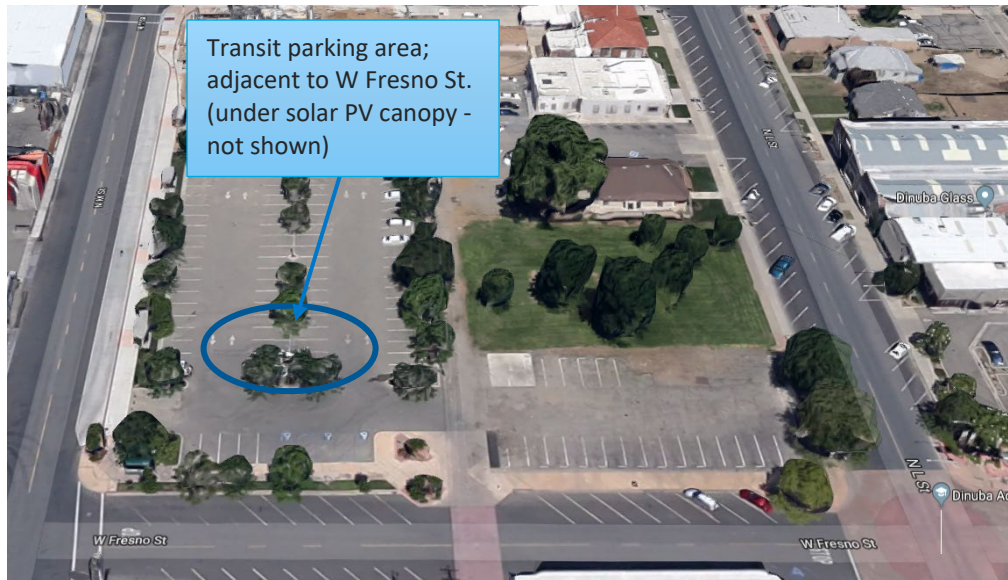


Figure 17 - Aerial photograph of Dinuba Transit Center: W Fresno St, between N M St. and N L St.

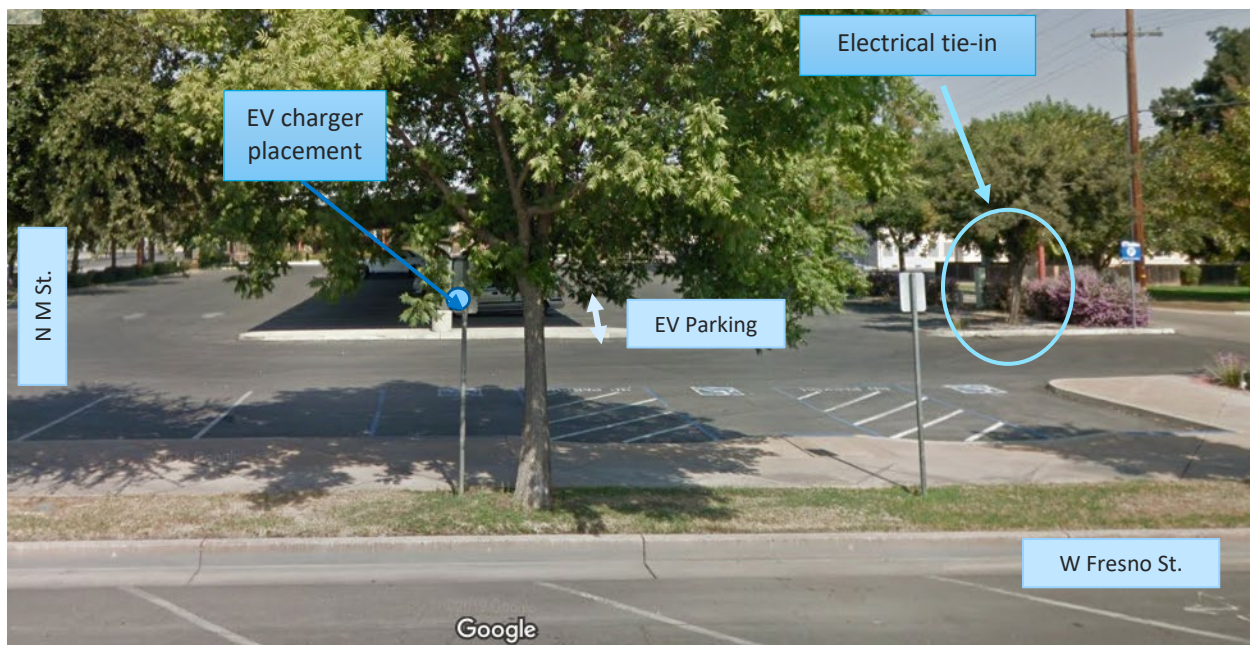


Figure 18 - Site location for EV charger placement

The two locations suggested for EV charger implementation were chosen based on the existing parking lot disabled person parking space placement. We are suggesting two Level-2 chargers to be placed on adjacent sides, taking up a total of four parking spots in the middle aisle of the parking lot under the solar carport canopy (Figure 18). The charger placement is also in close proximity to the electric tie-ins. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

Barriers and Opportunities:

At the end of the Case Studies section we included two tables that summarize the similar barriers that were identified across Tulare County (Table 24). We also highlight opportunities and best practices to overcome the barriers associated with EVSE installation in Table 25. A detailed description of all barriers, opportunities and best practices can be found in the Barriers and Opportunities section on p.45.

Cost and Funding Opportunities:

Willdan analyzed available and eligible incentives and suggests stakeholders apply for the Charge Up! Program from San Joaquin Valley Air Pollution Control District. This incentive is stackable, and we encourage stakeholders to pursue applications for additional incentives (i.e. CMAQ⁶⁰) if applicable. Based on Charge Up! requirements⁶¹ we created an estimated cost and funding analysis to include two scenarios (low/mid and high) with the dual port ChargePoint CT4021 – GW1 Gateway Unit⁶² (CP CT4021) and the ChargePoint CT4025-GW1 Gateway⁶³ (CP CT4025).

The tables below show a breakdown of the cost differentials for the purchase of a single L2 charger (Table 14) and two L2 chargers (Table 15). The low cost (recommended) and mid cost option assumes the CP CT4021 charger is selected and the high cost option assumes the CP CT4025 is selected. The low cost option also applies the (SJVAPCD) incentive.

Table 14 – Estimated Cost and Funding Analysis (Single L2 charger): Dinuba Transit Center⁶⁴

| | Low Cost | Mid Cost | High Cost |
|----------------------------------|----------|----------|-----------|
| Total Unit Cost ⁶⁵ | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost ⁶⁶ | \$11,885 | \$12,885 | \$13,885 |
| O&M Costs ⁶⁷ | \$300 | \$650 | \$1,020 |
| Incentives ⁶⁸ | \$6,000 | | |
| Total cost to City ⁶⁹ | \$13,395 | \$20,745 | \$23,115 |

Table 15– Estimated Cost and Funding Analysis (Two L2 chargers): Dinuba Transit Center

| | Low Cost | Mid Cost | High Cost |
|--|----------|----------|-----------|
|--|----------|----------|-----------|

⁶⁰ See Funding Table 45 for list of incentives and funding options.

⁶¹ EV Requirements are on page 2: http://www.valleyair.org/grants/documents/chargeup/CU!_Guidelines.pdf

⁶² [ChargePoint CT4021 – GW1 Gateway Unit](#) is a commercial electric vehicle charging station with an 18-foot retractable cable instead of the 23-foot. The length of the cable was suggested based on the parking dimensions at the City of Tulare.

⁶³ [ChargePoint CT4025 - GW1 Gateway Unit](#) is a commercial electric vehicle charging station. The unit is a dual port, bollard mount (self-supporting pedestal mount) with a 23-foot retractable cable with a power output of 7.2kW (AC).

⁶⁴ Assumptions made for the cost analysis are in Appendix C.

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ [SJVAPCD Charge Up](#) is an EVSE charger incentive program that reduces the total cost of the unit and installation of the charger.

The main eligibility criteria for the charger is that it must be [SAE J1772](#) compliant, must be [UL Listed](#) and must be [OCPP compliant](#).

⁶⁹ The low cost assumes the incentive would be applied and the CT4021 is selected; the mid cost would be selecting the same unit (CT4021) without the incentives; and the high cost would be selecting the CT4025 charger with 23ft cable vs 18ft).



| | | | |
|--------------------|----------|----------|----------|
| Total Unit Cost | \$14,420 | \$14,420 | \$16,420 |
| Installation Cost | \$15,025 | \$17,025 | \$19,025 |
| O&M Costs | \$600 | \$1,300 | \$2,040 |
| Incentives | \$12,000 | | |
| Total cost to City | \$18,045 | \$32,745 | \$37,485 |

City of Lindsay – Olivewood Plaza & Lindsay Branch Library

The city of Lindsay has a population of 13,303⁷⁰. Lindsay has no previously existing EV charging stations. The initial perception of EV adoption city-wide is very low. Despite low EV adoption, there is significant interest in implementing EV charging stations. City personnel have been transitioning city fleets to hybrid vehicles and CNG vehicles; expressing significant interest in electrification of fleets.

The suggested sites included eight locations, 3 on public property (Lindsay City Hall, Transit Center, Lindsay Branch Library). There was a general understanding of EVs at the city level, but community outreach on EV and EV charger education has not taken place.

We reached out to owners of privately-owned stores in the city to gauge interest in EV charger implementation at their sites but were unable to reach a person with decision making authority or they were not interested at this time due to perceived costs and time.

City of Lindsay

- Population: 13,303
- City handles EV charger permitting
- Point of Contact: Michael Camarena, City Services Director
- Site selection: Olivewood Plaza & Lindsay Branch Library

⁷⁰ Data reflects population estimates from July 1, 2018 estimates provided by the US Census Bureau: <https://www.census.gov/quickfacts/tularecitycalifornia>



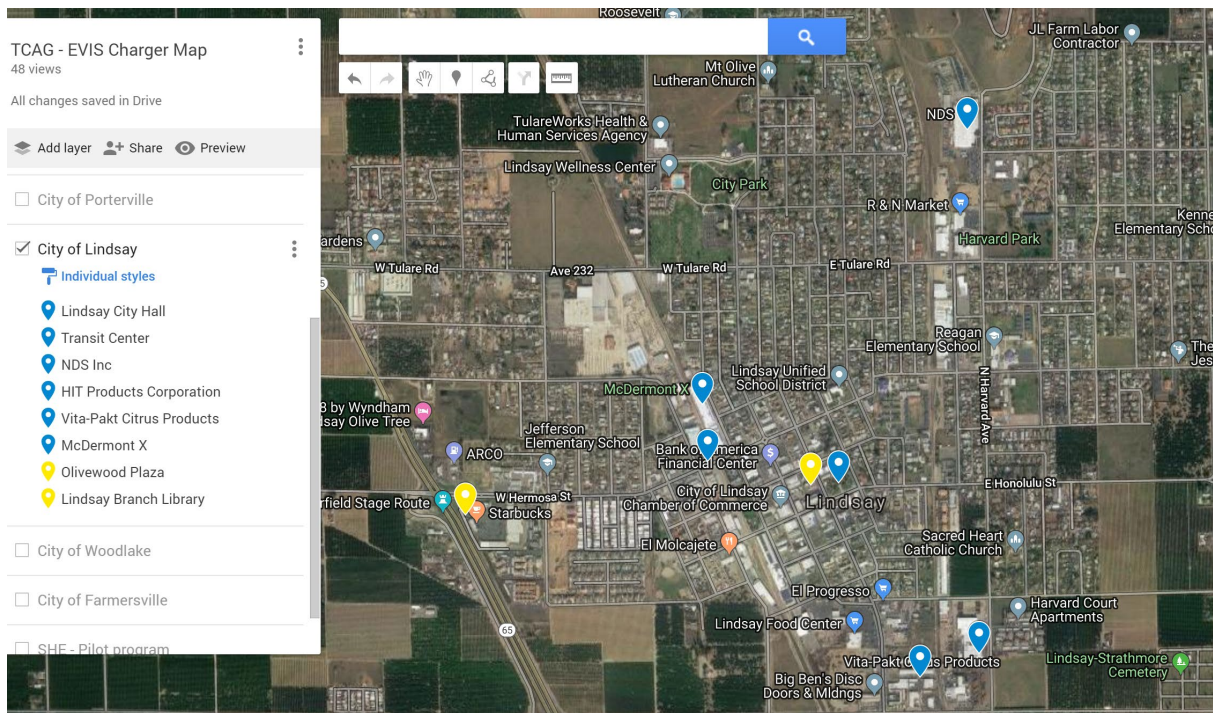


Figure 19 - EV Charger Map of Lindsay⁷¹

Site Analysis: Olivewood Plaza (Lindsay)

Using our EV Readiness Checklist and Siting Guidelines⁷², we visited Olivewood Plaza and evaluated the location. This site was selected due to stakeholder feedback based on heavy traffic to this lot. We were unable to determine a person with decision making authority for the lot but encourage the city to reach out to the property owner, as this would be an ideal location off CA-65. There are various retail and food stores surrounding the chosen location. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site.

⁷¹ Green pins are locations of existing EV chargers; blue pins are locations that were suggested by stakeholders; the yellow pin is the selected site location.

⁷² The Site Selection Guidelines can be found in the Barriers and Opportunities (Table 41).



Figure 20 - Aerial photograph of Olivewood Plaza: 210 CA-65, Lindsay, CA 93247

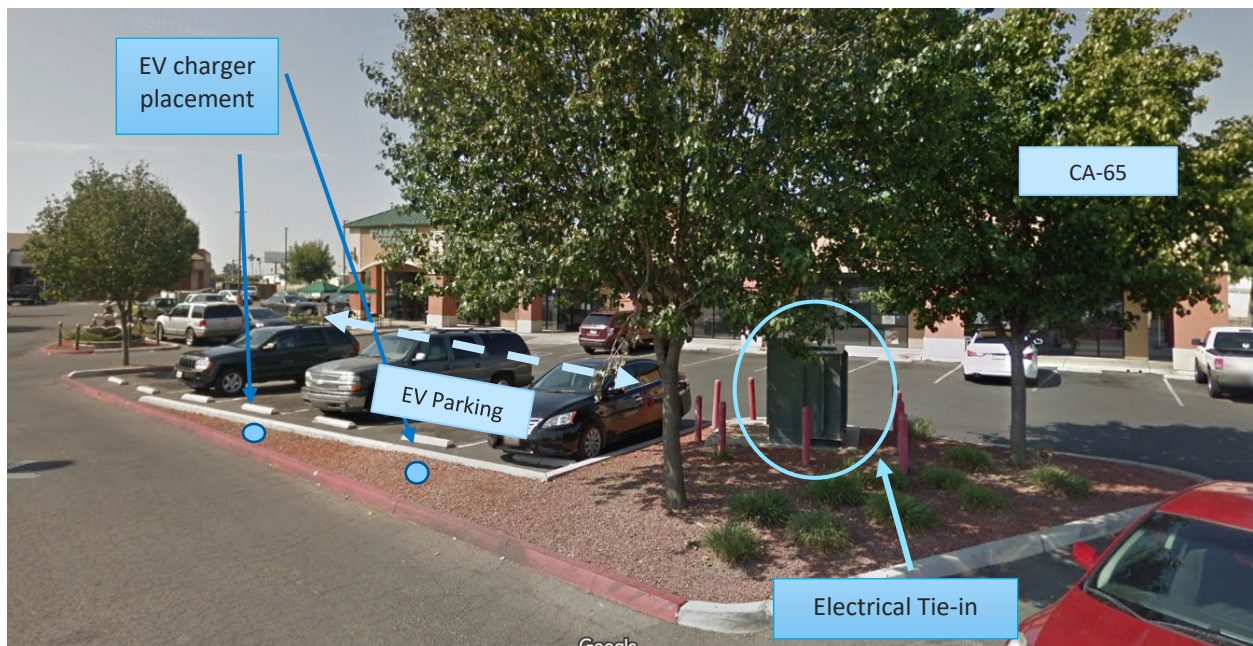


Figure 21 - Site location for EV charger placement – Olivewood Plaza (Lindsay)

We are suggesting two Level-2 chargers to be placed on adjacent sides, taking up a total of four parking spots. (Figure 3). The charger placement is also near the electric tie-in and accessible softscape⁷³. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

Site Analysis: Lindsay Branch Library

Using our EV Readiness Checklist and Siting Guidelines⁷⁴ we visited the Lindsay Library and evaluated the location. The Library is in 2-5 min walking distance to various retail, food stores, City of Lindsay Building Department, Lindsay City Hall and the Post Office. The off-street parking area is ADA compliant and there is ample parking, so designating parking for EVs would not impact visitors to the site.



Figure 22 - Aerial photograph of Lindsay Branch Library: 157 N Mirage Ave, Lindsay, CA 93247

⁷³ Softscape is landscaping that can include soil, plants, flower beds, trees; as opposed to hardscape, which is costlier to trench for EV charger implementation purposes.

⁷⁴ The Site Selection Guidelines can be found in the Barriers and Opportunities (Table 41).

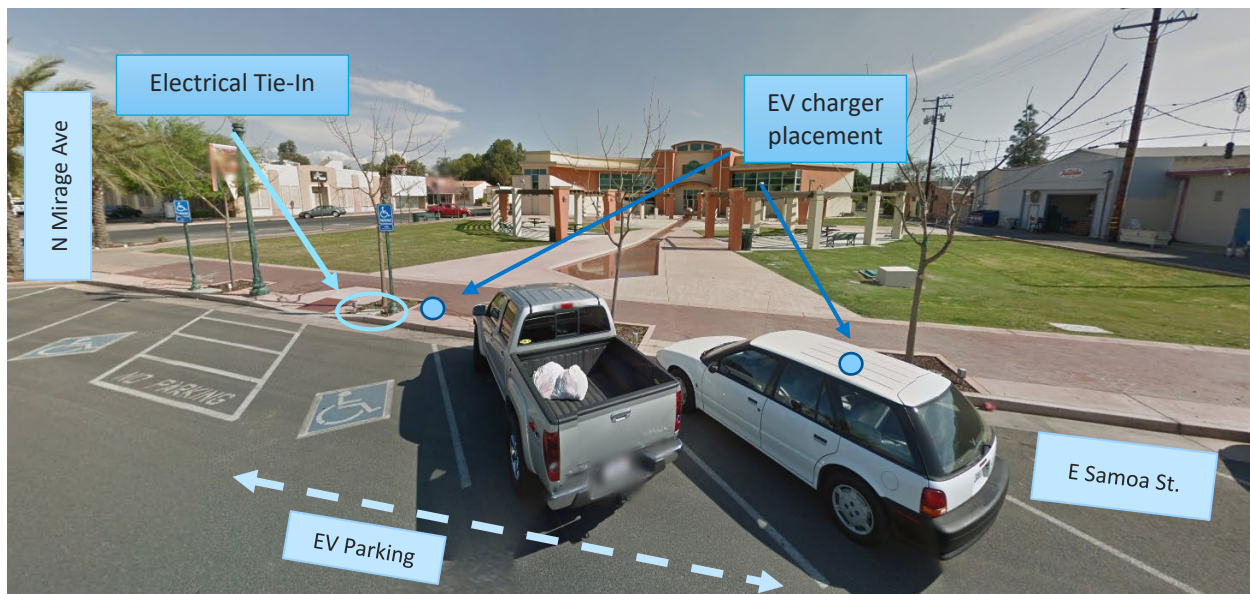


Figure 23 - Site location for EV charger placement – Lindsay Branch Library

We are suggesting two Level-2 chargers to be placed on adjacent sides, taking up a total of four parking spots on E Samoa Street (Figure 23). The charger placement is also in close proximity to an electric tie-in and accessible softscape⁷⁵. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

Barriers and Opportunities:

At the end of the Case Studies section we included two tables that summarize the similar barriers that were identified across Tulare County (Table 24). We also highlight opportunities and best practices to overcome the barriers associated with EVSE installation in Table 25. A detailed description of all barriers, opportunities and best practices can be found in the Barriers and Opportunities section on p.45.

Cost and Funding Opportunities:

Willdan analyzed available and eligible incentives and suggests stakeholders apply for the Charge Up! Program from San Joaquin Valley Air Pollution Control District. This incentive is stackable, and we encourage stakeholders to pursue applications for additional incentives (i.e. CMAQ⁷⁶) if applicable. Based on Charge Up! requirements⁷⁷ we created an estimated cost and funding analysis to include two scenarios (low/mid and high) with the dual port

⁷⁵ Softscape is landscaping that can include soil, plants, flower beds, trees; as opposed to hardscape, which is costlier to trench for EV charger implementation purposes.

⁷⁶ See Funding Table 45 for list of incentives and funding options.

⁷⁷ EV Requirements are on page 2: [http://www.valleyair.org/grants/documents/chargeup/CU! Guidelines.pdf](http://www.valleyair.org/grants/documents/chargeup/CU!%20Guidelines.pdf)

ChargePoint CT4021 – GW1 Gateway Unit⁷⁸ (CP CT4021) and the ChargePoint CT4025-GW1 Gateway⁷⁹ (CP CT4025).

The tables below show a breakdown of the cost differentials for the purchase of a single L2 charger (Table 16) and two L2 chargers (Table 17) at Olivewood Plaza. The low cost and mid cost option assumes the CP CT4021 charger is selected and the high cost option assumes the CP CT4025 is selected. The low cost option also applies the (SJVAPCD) incentive.

Table 16 – Estimated Cost and Funding Analysis (Single L2 charger): Olivewood Plaza (Lindsay)⁸⁰

| | Low Cost | Mid Cost | High Cost |
|----------------------------------|----------|----------|-----------|
| Total Unit Cost ⁸¹ | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost ⁸² | \$2,551 | \$3,551 | \$4,551 |
| O&M Costs ⁸³ | \$300 | \$650 | \$1,020 |
| Incentives ⁸⁴ | \$6,000 | | |
| Total cost to City ⁸⁵ | \$4,061 | \$11,411 | \$13,781 |

Table 17 – Estimated Cost and Funding Analysis (Two L2 chargers): Olivewood Plaza (Lindsay)

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$14,420 | \$14,420 | \$16,420 |
| Installation Cost | \$4,574 | \$6,574 | \$8,574 |
| O&M Costs | \$600 | \$1,300 | \$2,040 |
| Incentives | \$12,000 | | |
| Total cost to City | \$7,594 | \$22,294 | \$27,034 |

⁷⁸ [ChargePoint CT4021 – GW1 Gateway Unit](#) is a commercial electric vehicle charging station with an 18-foot retractable cable instead of the 23-foot. The length of the cable was suggested based on the parking dimensions at the City of Tulare.

⁷⁹ [ChargePoint CT4025 - GW1 Gateway Unit](#) is a commercial electric vehicle charging station. The unit is a dual port, bollard mount (self-supporting pedestal mount) with a 23-foot retractable cable with a power output of 7.2kW (AC).

⁸⁰ Assumptions made for the cost analysis are in Appendix C.

⁸¹ Ibid.

⁸² Ibid.

⁸³ Ibid.

⁸⁴ [SJVAPCD Charge Up](#) is an EVSE charger incentive program that reduces the total cost of the unit and installation of the charger. The main eligibility criteria for the charger is that it must be [SAE J1772](#) compliant, must be [UL Listed](#) and must be [OCCP compliant](#).

⁸⁵ The low cost assumes the incentive would be applied and the CT4021 is selected; the mid cost would be selecting the same unit (CT4021) without the incentives; and the high cost would be selecting the CT4025 charger (with 23ft cable vs 18ft).



The tables below show a breakdown of the cost differentials for the purchase of a single Level-2 charger (Table 18) and two Level-2 chargers (Table 19) at Lindsay Branch Library. The low cost and mid cost option assumes the CP CT4021 charger is selected and the high cost option assumes the CP CT4025 is selected. The low cost option also applies the (SJVAPCD) incentive.

Table 18 – Estimated Cost and Funding Analysis (Single L2 charger): Lindsay Branch Library

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost | \$6,650 | \$10,650 | \$14,650 |
| O&M Costs | \$300 | \$650 | \$1,020 |
| Incentives | \$6,000 | | |
| Total cost to City | \$8,160 | \$18,510 | \$23,880 |

Table 19 – Estimated Cost and Funding Analysis (Two L2 chargers): Lindsay Branch Library

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$14,420 | \$14,420 | \$16,420 |
| Installation Cos | \$11,330 | \$16,330 | \$21,330 |
| O&M Costs | \$600 | \$1,300 | \$2,040 |
| Incentive | \$12,000 | | |
| Total cost to City | \$14,350 | \$32,050 | \$39,790 |

City of Farmersville – Rest Stop

The city of Farmersville has a population of 10,788⁸⁶. Farmersville has no previously existing EV charging stations. The initial perception of EV adoption city-wide is very low. Despite low EV adoption, there is interest in implementing EV charging stations.

The suggested sites included one publicly owned property and three privately owned locations. There was a general understanding of EVs at the city level, but community outreach on EV and EV charger education has not taken place.

We reached out to owners of privately-owned stores in the city to gauge interest in EV charger implementation at their sites but were unable to reach a person with decision making authority or they were not interested at this time due to perceived costs and time.

City of Farmersville

- Population: 10,778
- County handles EV charger permitting
- Point of Contact: Jennifer Gomez, City Manager
- Site selection: Rest Stop

⁸⁶ Data reflects population estimates from July 1, 2018 estimates provided by the US Census Bureau: <https://www.census.gov/quickfacts/tularecitycalifornia>



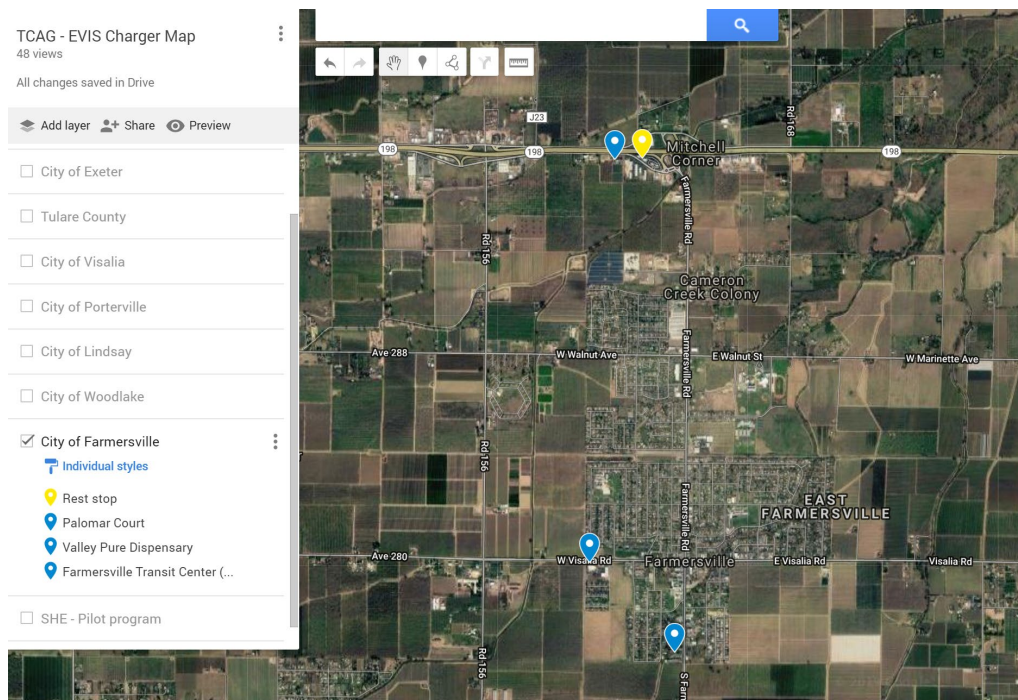


Figure 24 - EV Charger Map of Farmersville⁸⁷

Site Analysis: Rest Stop (Farmersville)

Using our EV Readiness Checklist and Siting Guidelines⁸⁸, we visited the rest stop off CA-198 and evaluated the location. This rest stop is in close proximity to a couple of fast food restaurants and a dispensary. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site. The dispensary nearby is under construction, but is owned by the same company as the one in Woodlake which brings a significant amount of vehicle traffic to the area.

⁸⁷ Green pins are locations of existing EV chargers; blue pins are locations that were suggested by stakeholders; the yellow pin is the selected site location.

⁸⁸ The Site Selection Guidelines can be found in the Barriers and Opportunities Section (Table 41).



Figure 25 - Aerial photograph of Farmersville Rest Stop: 452 Avenue 295, Farmersville, CA 93223

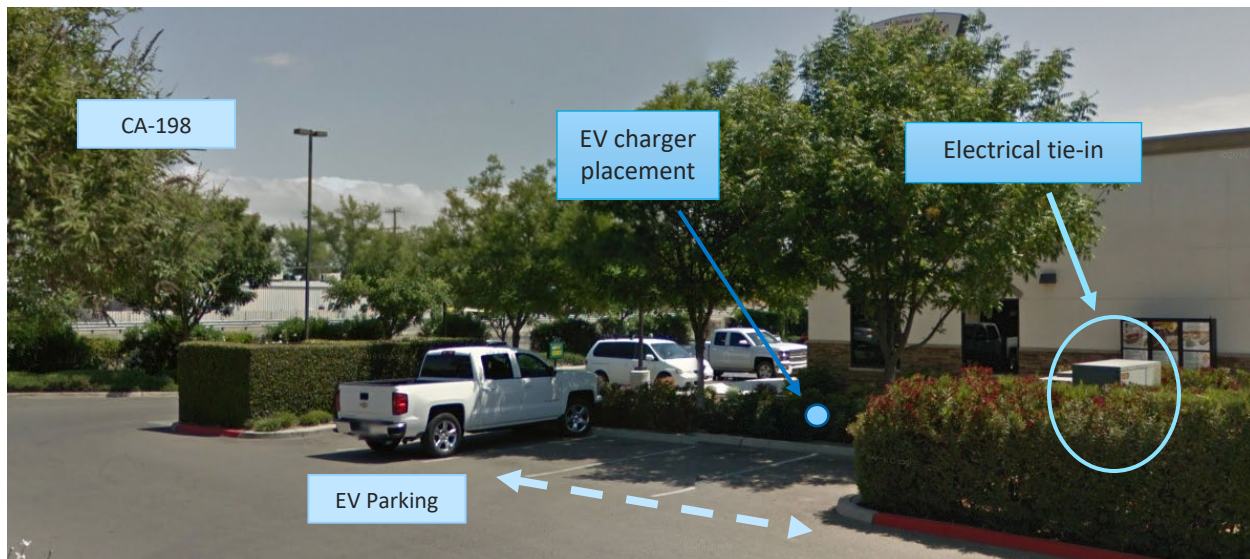


Figure 26 - Site location for EV charger placement – Farmersville Rest Stop

The suggested location for an EV charger installation was chosen based on the existing parking lot layout and access via soft scape⁸⁹ to an electrical tie-in. We are suggesting one level 3 charger to be placed in the middle of the two spots nearest the existing transformer, taking up a total of two parking spots adjacent to Subway (Figure 38). Conduit for this level 3 charger can be run through the soft scape for easier and more economical installation and any future expansions can be added further down this same parking row. Current California Building Code

⁸⁹ Softscape is landscaping that can include soil, plants, flower beds, trees; as opposed to hardscape, which is costlier to trench for EV charger implementation purposes.

requires that one of the two EV charging spots be van accessible so restriping may be necessary upon installation. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

Barriers and Opportunities:

At the end of the Case Studies section we included two tables that summarize the similar barriers that were identified across Tulare County (Table 24). We also highlight opportunities and best practices to overcome the barriers associated with EVSE installation in Table 25. A detailed description of all barriers, opportunities and best practices can be found in the Barriers and Opportunities section on p.45.

Cost and Funding Opportunities:

Willdan analyzed available and eligible incentives and suggests stakeholders apply for the Charge Up! Program from San Joaquin Valley Air Pollution Control District. This incentive is stackable, and we encourage stakeholders to pursue applications for additional incentives (i.e. CMAQ⁹⁰) if applicable.

The table below shows a breakdown of the cost differentials for the purchase of a single Level-3 charger (Table 21) with and without incentive. All three cost estimates below use the Chargepoint Express 250 60kW DC Fast Charger⁹¹. The low cost option also applies the (SJVAPCD) incentive.

Table 20 – Estimated Cost and Funding Analysis (Single L3 Charger): Woodlake Community Center⁹²

| | Low Cost | Mid Cost | High Cost |
|----------------------------------|----------|----------|-----------|
| Total Unit Cost ⁹³ | \$35,800 | \$35,800 | \$35,800 |
| Installation Cost ⁹⁴ | \$15,090 | \$23,890 | \$32,690 |
| O&M Costs ⁹⁵ | \$800 | \$1,600 | \$2,900 |
| Incentives ⁹⁶ | \$25,000 | | |
| Total cost to City ⁹⁷ | \$26,690 | \$61,290 | \$71,390 |

⁹⁰ See Funding Table 45 for list of incentives and funding options.

⁹¹ [ChargePoint Express 250 \(60kW DCFC\)](#) charger is a commercial electric vehicle fast charger (Level 3) a with a 12-foot retractable cable.

⁹² Assumptions made for the cost analysis are in Appendix C.

⁹³ Ibid.

⁹⁴ Ibid.

⁹⁵ Ibid.

⁹⁶ [SJVAPCD Charge Up](#) is an EVSE charger incentive program that reduces the total cost of the unit and installation of the charger. The main eligibility criteria for the charger is that it must be [SAE J1772](#) compliant, must be [UL Listed](#) and must be [OCCP compliant](#).

⁹⁷ The low cost assumes the incentive would be applied and the CT4021 is selected; the mid cost would be selecting the same unit (CT4021) without the incentives; and the high cost would be selecting the CT4025 charger (with 23ft cable vs 18ft).



City of Exeter – Shopping Plaza

The city of Exeter has a population of 10,553⁹⁸. Exeter has two previously existing EV charging stations. The initial perception of EV adoption city-wide is very low. Despite low EV adoption, there is interest in implementing EV charging stations.

The suggested sites included three publicly owned properties and three privately owned locations. There was a general understanding of EVs at the city level, but community outreach on EV and EV charger education has not taken place.

We reached out to owners of privately-owned stores in the city to gauge interest in EV charger implementation at their sites but were unable to reach a person with decision making authority or they were not interested at this time due to perceived costs and time.

City of Exeter

- Population: 10,553
- County handles EV charger permitting
- Point of Contact: Daymon Qualls, Public Works Director
- Site selection: Shopping Plaza

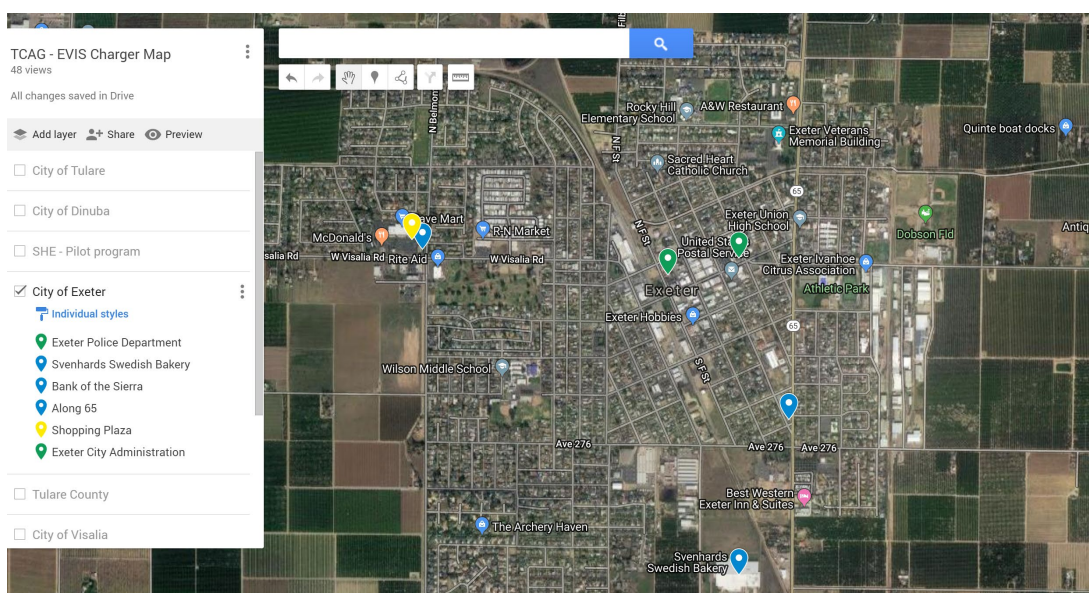


Figure 27 - EV Charger Map of Exeter⁹⁹

Site Analysis: Shopping Plaza (Exeter)

Using our EV Readiness Checklist and Siting Guidelines¹⁰⁰, we visited the shopping plaza and Citrus plaza to evaluate the sites. The shopping plaza on the north side had more traffic and Daymon confirmed it would be a better location. There are many retail stores surrounding the chosen site. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site. There are also two additional plazas in walking distance.

⁹⁸ Data reflects population estimates from July 1, 2018 estimates provided by the US Census Bureau:

<https://www.census.gov/quickfacts/tularecitycalifornia>

⁹⁹ Green pins are locations of existing EV chargers; blue pins are locations that were suggested by stakeholders; the yellow pin is the selected site location.

¹⁰⁰ The Site Selection Guidelines can be found in the Barriers and Opportunities Section (Table 41).

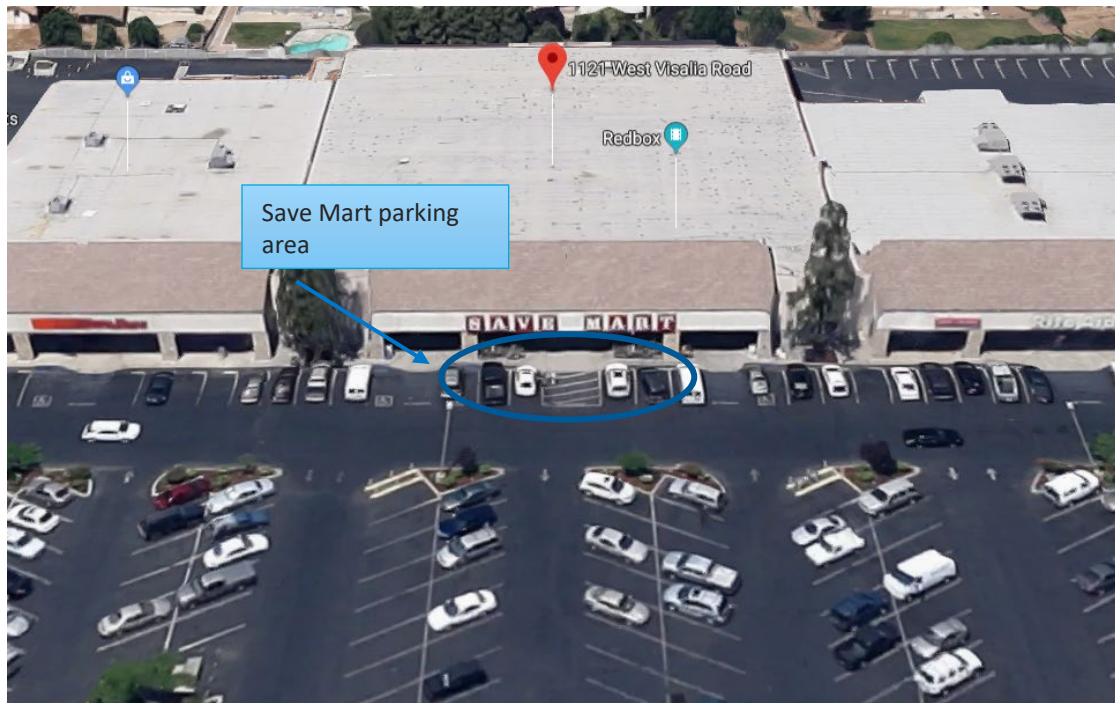


Figure 28 - Aerial photograph of Save Mart parking lot: 1121 W Visalia Rd, Exeter, CA 93221

The two locations suggested for EV charger implementation were chosen based on the existing parking lot disabled person parking space placement. We are suggesting two Level-2 chargers to be placed on either side of the van accessible spots, taking up a total of four parking spots in front of the Save Mart Shopping Center (Figure 31). The charger placement minimizes installation costs by locating close to approximate electrical tie-ins and by leveraging existing van accessible spots to avoid restriping. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

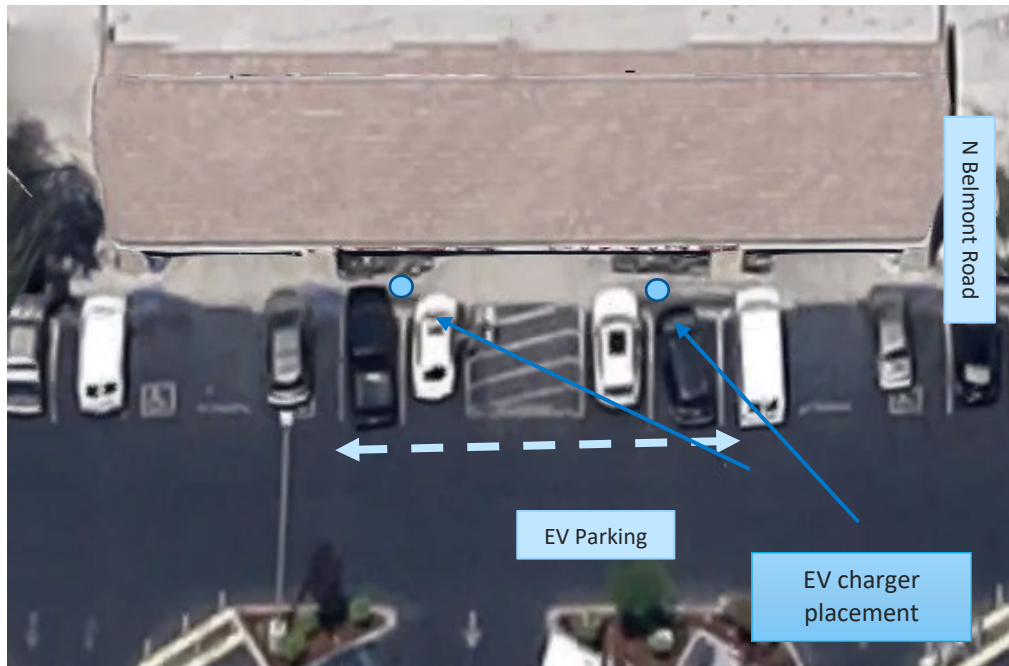


Figure 29 - Site location for EV charger placement – Save Mart (Exeter)

Barriers and Opportunities:

At the end of the Case Studies section we included two tables that summarize the similar barriers that were identified across Tulare County (Table 24). We also highlight opportunities and best practices to overcome the barriers associated with EVSE installation in Table 25. A detailed description of all barriers, opportunities and best practices can be found in the Barriers and Opportunities section on p.45.

Cost and Funding Opportunities:

Willdan analyzed available and eligible incentives and suggests stakeholders apply for the Charge Up! Program from San Joaquin Valley Air Pollution Control District. This incentive is stackable, and we encourage stakeholders to pursue applications for additional incentives (i.e. CMAQ¹⁰¹) if applicable. Based on Charge Up! Requirements¹⁰² we created an estimated cost and funding analysis to include two scenarios (low/mid and high) with the dual port ChargePoint CT4021 – GW1 Gateway Unit¹⁰³ (CP CT4021) and the ChargePoint CT4025-GW1 Gateway¹⁰⁴ (CP CT4025).

The tables below show a breakdown of the cost differentials for the purchase of a single L2 charger (Table 22) and two L2 chargers (Table 23). The low cost (recommended) and mid cost option assumes the CP CT4021 charger is selected and the high cost option assumes the CP CT4025 is selected. The low cost option also applies the (SJVAPCD) incentive.

¹⁰¹ See Funding Table 45 for list of incentives and funding options.

¹⁰² EV Requirements are on page 2: http://www.valleyair.org/grants/documents/chargeup/CU!_Guidelines.pdf

¹⁰³ [ChargePoint CT4021 – GW1 Gateway Unit](#) is a commercial electric vehicle charging station with an 18-foot retractable cable instead of the 23-foot.

¹⁰⁴ [ChargePoint CT4025 - GW1 Gateway Unit](#) is a commercial electric vehicle charging station. The unit is a dual port, bollard mount (self-supporting pedestal mount) with a 23-foot retractable cable with a power output of 7.2kW (AC).

Table 21 – Estimated Cost and Funding Analysis (Single L2 charger): Shopping Plaza (Exeter)¹⁰⁵

| | Low Cost | Mid Cost | High Cost |
|-----------------------------------|----------|----------|-----------|
| Total Unit Cost ¹⁰⁶ | \$7,210 | \$7,210 | \$8,210 |
| Installation Cost ¹⁰⁷ | \$13,530 | \$14,530 | \$15,530 |
| O&M Costs ¹⁰⁸ | \$300 | \$650 | \$1,020 |
| Incentives ¹⁰⁹ | \$6,000 | | |
| Total cost to City ¹¹⁰ | \$15,040 | \$22,390 | \$24,760 |

Table 22 – Estimated Cost and Funding Analysis (Two L2 chargers): Shopping Plaza (Exeter)

| | Low Cost | Mid Cost | High Cost |
|--------------------|----------|----------|-----------|
| Total Unit Cost | \$14,420 | \$14,420 | \$16,420 |
| Installation Cost | \$16,670 | \$18,670 | \$20,670 |
| O&M Costs | \$600 | \$1,300 | \$2,040 |
| Incentives | \$12,000 | | |
| Total cost to City | \$19,690 | \$34,390 | \$39,130 |

City of Woodlake – Community Center

The city of Woodlake has a population of 7,649. Woodlake has no previously existing EV charging stations. The initial perception of EV adoption city-wide is very low. Despite low EV adoption, there is interest in implementing EV charging stations, since the city gets many tourists on their way to the Sequoias.

The suggested sites included two publicly owned properties. There was a general understanding of EVs at the city level, but community outreach on EV and EV charger education has not taken place.

City of Woodlake

- Population: 7,649
- City handles EV charger permitting
- Point of Contact: Jason Waters, Community Services Director
- Site selection: Community Center

¹⁰⁵ Assumptions made for the cost analysis are in Appendix C.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

¹⁰⁹ [SJVAPCD Charge Up](#) is an EVSE charger incentive program that reduces the total cost of the unit and installation of the charger. The main eligibility criteria for the charger is that it must be [SAE J1772](#) compliant, must be [UL Listed](#) and must be [OCCP compliant](#).

¹¹⁰ The low cost assumes the incentive would be applied and the CT4021 is selected; the mid cost would be selecting the same unit (CT4021) without the incentives; and the high cost would be selecting the CT4025 charger (with 23ft cable vs 18ft).



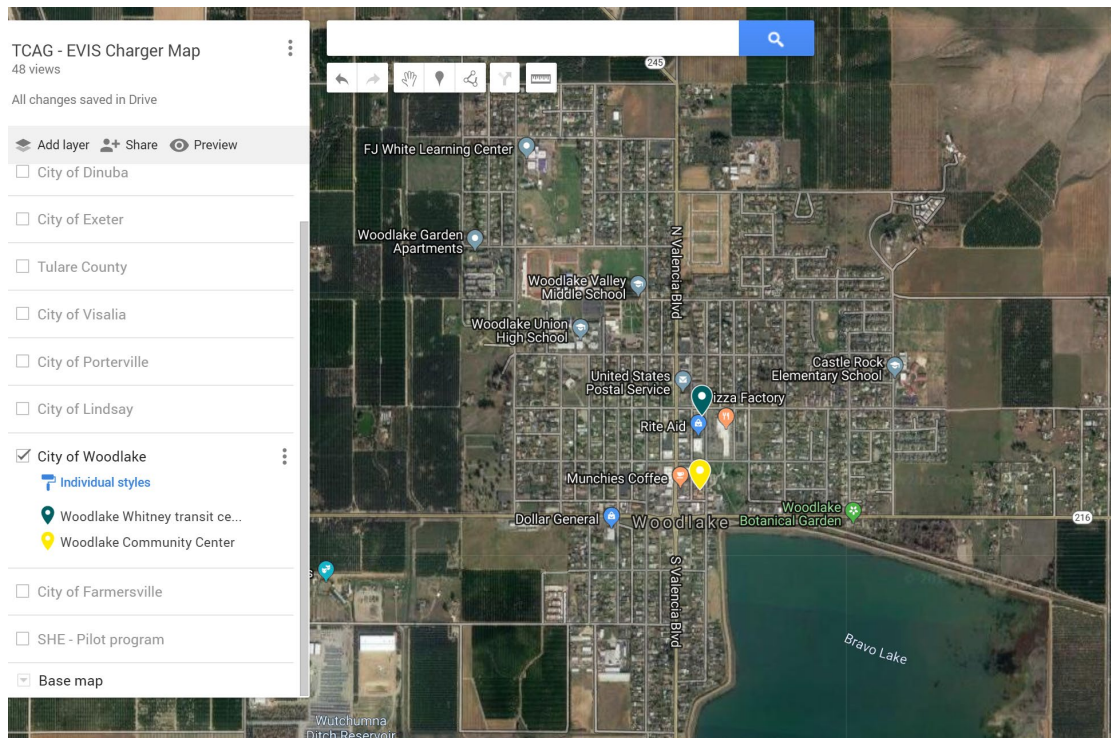


Figure 30 - EV Charger Map of Woodlake¹¹¹

Site Analysis: Community Center (Woodlake)

We met with Jason Waters and evaluated the community center at Woodlake using our EV Readiness Checklist and Siting Guidelines.¹¹² The community center is in downtown Woodlake and in walking distance to a coffee shop and dispensary. The lot is ADA compliant and has ample parking, so designating parking for EVs would not impact visitors to the site.

¹¹¹ Green pins are locations of existing EV chargers; blue pins are locations that were suggested by stakeholders; the yellow pin is the selected site location.

¹¹² The Site Selection Guidelines can be found in the Barriers and Opportunities Section (Table 41).

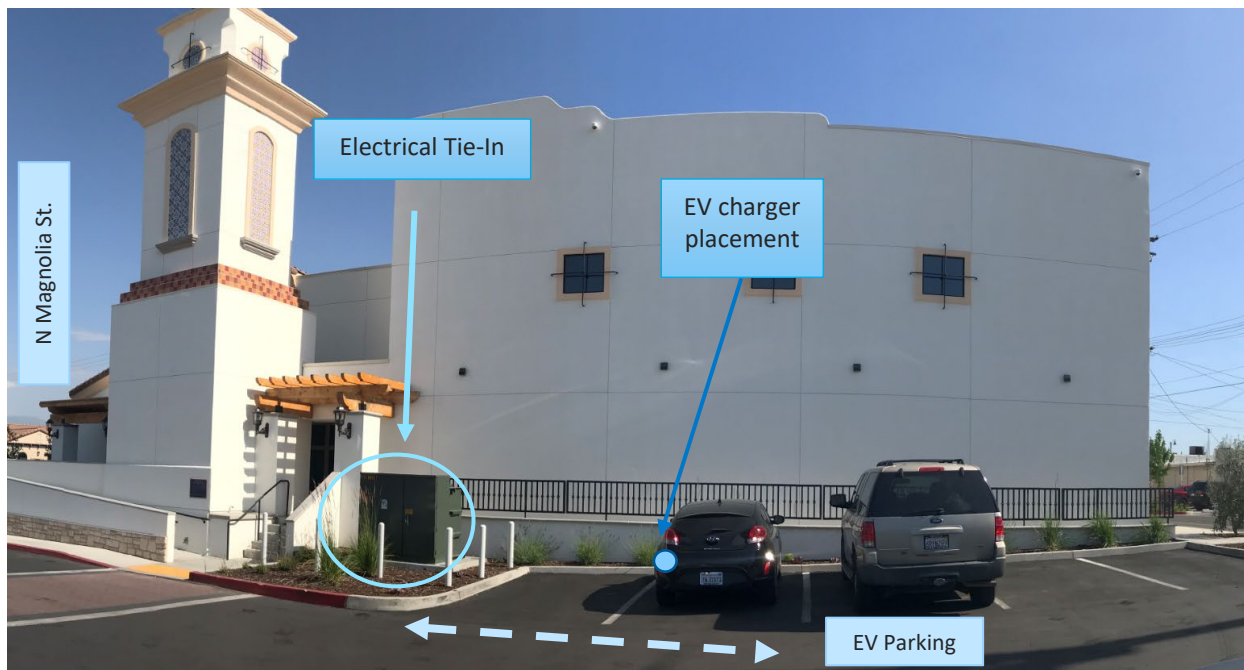


Figure 31 - Site location for EV charger placement

The location suggested for EV charger installation was chosen based on preferences of city staff and as an added feature for their new community center. Due to the site's proximity to the main thoroughfare in Westlake which is frequented by Sequoia-bound travelers, we are suggesting a single level 3 (L3) dual port charger to rapidly charge travelers vehicles, servicing two parking spots (Figure 33). The charger placement is also in close proximity to the electrical tie-ins and accessible softscape¹¹³. This lot is publicly accessible 24 hours a day and there is lighting on overnight.

Barriers and Opportunities:

At the end of the Case Studies section we included two tables that summarize the similar barriers that were identified across Tulare County (Table 24). We also highlight opportunities and best practices to overcome the barriers associated with EVSE installation in Table 25. A detailed description of all barriers, opportunities and best practices can be found in the Barriers and Opportunities section on p.45.

Cost and Funding Opportunities:

Willdan analyzed available and eligible incentives and suggests stakeholders apply for the Charge Up! Program from San Joaquin Valley Air Pollution Control District. This incentive is stackable, and we encourage stakeholders to pursue applications for additional incentives (i.e. CMAQ¹¹⁴) if applicable. Based on Charge Up! requirements¹¹⁵ we created an estimated cost and funding analysis to include two scenarios (low/mid and high) with a dual port 60kW Level-3 DC Fast Charger.

¹¹³ Softscape is landscaping that can include soil, plants, flower beds, trees; as opposed to hardscape, which is costlier to trench for EV charger implementation purposes.

¹¹⁴ See Funding Table 45 for list of incentives and funding options.

¹¹⁵ EV Requirements are on page 2: http://www.valleyair.org/grants/documents/chargeup/CU!_Guidelines.pdf

The table below shows a breakdown of the cost differentials for the purchase of a single Level-3 charger (Table 20) with and without incentive. All three cost estimates below use the Chargepoint Express 250 60kW DC Fast Charger¹¹⁶. The low cost option also applies the (SJVAPCD) incentive.

Table 23 - Estimated Cost and Funding Analysis (Single L3 Charger): Woodlake Community Center¹¹⁷

| | Low Cost | Mid Cost | High Cost |
|-----------------------------------|----------|----------|-----------|
| Total Unit Cost ¹¹⁸ | \$35,800 | \$35,800 | \$35,800 |
| Installation Cost ¹¹⁹ | \$15,090 | \$23,890 | \$32,690 |
| O&M Costs ¹²⁰ | \$800 | \$1,600 | \$2,900 |
| Incentives ¹²¹ | \$25,000 | | |
| Total cost to City ¹²² | \$26,690 | \$61,290 | \$71,390 |

Case Study Barriers & Opportunities Summary

The case studies highlighted in this report present a viable opportunity to expand EVSE infrastructure in Tulare County. There were many similarities amongst the barriers to EVSE implementation and EV adoption across sites and below is a table summarizing our findings (Table 24). The subsequent table indicates best practices that can be applied in each city and are recommended to ensure a comprehensive and streamlined EVSE network expansion.

Table 24 - Summary of Barriers for Tulare County

| Barrier | Description |
|--------------------------|---|
| Lack of Public Awareness | While most city personnel are aware of existence of EV chargers, the general public has minimal awareness of the availability of EV chargers; available incentives or current costs of EVs and EV chargers |
| Economic Challenges | Limited city budgets for EVSE infrastructure and the high concentration of low-income populations in Tulare County deter EV adoption and EVSE implementation; general perception of cost of EVs and installing EV chargers is considered high |

¹¹⁶ [ChargePoint Express 250 \(60kW DCFC\)](#) charger is a commercial electric vehicle fast charger (Level 3) a with a 12-foot retractable cable.

¹¹⁷ See Appendix C for installation cost analysis and assumptions.

¹¹⁸ Ibid.

¹¹⁹ Ibid.

¹²⁰ Ibid.

¹²¹ [SJVAPCD Charge Up](#) is an EVSE charger incentive program that reduces the total cost of the unit and installation of the charger. The main eligibility criteria for the charger is that it must be [SAE J1772](#) compliant, must be [UL Listed](#) and must be [OCPD compliant](#).

¹²² The low cost assumes the incentive would be applied and the CT4021 is selected; the mid cost would be selecting the same unit (CT4021) without the incentives; and the high cost would be selecting the CT4025 charger (with 23ft cable vs 18ft).



| | |
|------------------------------------|--|
| Charging Station Siting Guidelines | Local government agencies are unsure where EVSE should be installed |
| Parking and Signage | Existing EV parking signage demonstrated easy adoption and clear messaging; as EVSE designated parking increases EV parking enforcement may be a challenge |
| Building Code | No perceived barriers to building code adherence |
| Zoning Policy | No perceived barriers to zoning policy adherence |
| Permitting | No perceived barriers to permitting for EVSE implementation |
| Training | There are no perceived barriers to training electrical contractors and at places where EVSE implementation exists, there were no issues with installations |
| Workplace Charging | Installing EVSE at workplaces is a barrier due to the challenges with garnering initial support from key stakeholders, but with cooperation of lot/property managers, this can be overcome as a challenge. |
| Utility System Impacts | There is no perceived impact to the electric grid |

Table 25 – Overview of Best Practices

| Program Name | Synopsis | Barriers it helps to Overcome |
|---|---|--|
| San Joaquin Valley EV Readiness Plan and Planning Guide | Provides a variety of strategies and resources to assist local governments in the San Joaquin Valley to increase EV adoption | Public Awareness, Zoning Policy for PEVs, Parking and Signage, Permitting and Inspection |
| Car Sharing Programs: Mio Car ; Sacramento CarShare | Mio Car provides a car sharing service for local multi-unit dwellings and nearby residents; Mio Car has various features (i.e. ADA adaptive controls) and services (i.e. insurance for drivers/car) included in their program; Sacramento CarShare provides low cost options for residents to use a vehicle in lieu of owning their own | Public Awareness, Economic Challenge and Charging in MUDs |
| Valley Clean Air Now | Provides incentives to low-income to replace highly polluting cars with EVs | Public Awareness, Economic Challenge |
| SCE Charge Ready | Provides infrastructure needed to support EVs, provides rebates for chargers | Public Awareness, Economic Challenge, Charging in MUDs |
| Electrify America | Installs public DC fast charging stations, promotes EVs throughout the country; Partnership with Walmart is an encouraged source for EVSE implementation at all Walmarts in Tulare County | Public Awareness |



| Program Name | Synopsis | Barriers it helps to Overcome |
|--|---|---|
| Direct Financial Incentives: Federal tax credits , CA Clean Vehicle Rebate , SCE Clean Fuel Reward Program , Drive Clean | Rebates, discounts, and tax credits to reduce purchase price of EVs | Economic Challenge |
| Charging Incentives: SJVAPCD Charge Up , TOU EV rates | Rebates, discounts, and tax credits to reduce purchase price and installation costs of EV charging stations. Specific EV residential rates to reduce charging costs. | Public Awareness, Economic Challenge |
| Non-Financial Incentives | Provides additional, non-financial, benefits to EV ownership including access to HOV lanes, | Public Awareness |
| Ride and Drive Events | Allows community members to get behind the wheel of and learn the benefits of EVs | Public Awareness |
| Self Help Enterprises (S.H.E.) | Creating outreach plans and materials for residents at S.H.E. complexes and local CBOs; focusing on a community-based and informed approach to strategizing outreach. | Public Awareness, Economic Challenge |
| California Green Building Code | Requires new MUDs and commercial spaces to set aside parking spaces for EVs. Tenants cannot be prohibited from installing EV chargers in existing MUDs. | Public Awareness, Charging in MUDs, Parking and Signage |
| Siting Selection and Analysis | Guidelines on how Tulare County can evaluate different options for public charging stations | Siting Chargers |

Barriers and Opportunity Report



As part of the larger Electric Vehicle Implementation Study (EVIS), a Barriers and Opportunities Report is a key element to better understanding the challenges faced in electric vehicle (EV) adoption and electric vehicle service equipment (EVSE) expansion within Tulare County. Our goal is to increase EVSE implementation by identifying obstacles and highlighting ways and best practices tailored for Tulare County. Working from the implementation barriers identified through the 2014 *San Joaquin Valley Plug-In Electric Vehicle Readiness Plan*¹²³, Willdan conducted stakeholder interviews and research with the goal of developing a customized and updated Barriers and Opportunities matrix for municipalities within Tulare County. This report contains a list of barriers that were evaluated; a section detailing the barriers and opportunities; and a section on best practices for EVSE implementation.

Willdan's research revealed common barriers to EV adoption and EVSE implementation among the different municipalities within Tulare County. Many of the barriers identified were included in the San Joaquin Valley PEV Readiness Plan, but we did not anticipate the degree to which they impacted EV adoption or infrastructure development in the County given where municipalities are at in their own EV adoption process. We identified and listed a variety of resources and opportunities Tulare County can use to help overcome each of the barriers. Not all barriers apply to each city within Tulare County, as different barriers arise depending on the current level of EV adoption.

Table 26 – Summary of Barriers in Tulare County

| Barrier | Description |
|------------------------------------|--|
| Lack of Public Awareness | General population is not aware of the availability of EVs, EVSE's; available incentives and current costs |
| Economic Challenges | Tulare County has a significant population categorized as low-income, which may deter people from purchasing an EV |
| DACs and MUDs | DACs are adversely impacted by local air pollution and stand the most to gain from transportation electrification; MUDs may not have ideal EVSE opportunities |
| Charging Station Siting Guidelines | Local government agencies have suggestions for where EVSE should be charged based on proximity to retail and areas with high traffic but are open to guidance. |
| Parking and Signage | Existing EV parking signage demonstrated easy adoption and clear messaging; as EVSE designated parking increase EV parking enforcement may be a challenge |
| Building Code | No perceived barriers to building code adherence |
| Zoning Policy | No perceived barriers to zoning policy adherence |
| Permitting | No perceived barriers to permitting for EVSE implementation |
| Training | There are no perceived barriers to training electrical contractors and at places where EVSE implementation exists, there were no issues with installations |
| Workplace Charging | Installing EVSE at workplaces is a barrier due to the challenges placed on public usage, but with cooperation of lot owners, can be overcome as a challenge. |

¹²³ San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide: https://energycenter.org/sites/default/files/docs/nav/programs/pev-planning/san-joaquin/san_joaquin_valley_pev_readiness_plan-web.pdf



| | |
|------------------------|---|
| Fleet Electrification | The major barrier to fleet electrification is cost; Porterville has made plans to convert their fleet and other cities (Visalia and Lindsay) expressed interest, but initial capital cost is a barrier. |
| Utility System Impacts | There is a barrier with qualifying for existing utility programs for EVSE implementation and cities that have participated experienced a delay with design and installation. Unmanaged charging can add significant cost to utility spending. |

Lack of Public Awareness

While California has the highest EV market share and number of EV sales within the US, these purchases tend to be focused in more urban areas of the state, such as the San Francisco Bay Area, Los Angeles and Sacramento¹²⁴. During initial outreach calls, various stakeholders expressed a general lack of electric vehicle charging stations and electric vehicle usage within Tulare County. The exceptions were in larger cities (Visalia, Tulare and Porterville); amongst county officials; and during our discussion with Self Help Enterprises. Stakeholders indicated that they had “seen electric vehicles passing through”, but the majority “didn’t see too many [EVs] on a daily basis.” The City of Visalia and Stakeholders also mentioned that there is little to no EV adoption due to the “low income” demographics and the “high-cost” perception of EVs in smaller cities in Tulare county. There was also a lack of knowledge of functioning EV charging stations and those that knew of their locations, were not aware of cost structures. Of those who knew about EVs, they thought they couldn’t afford them or that they weren’t practical for their purposes.

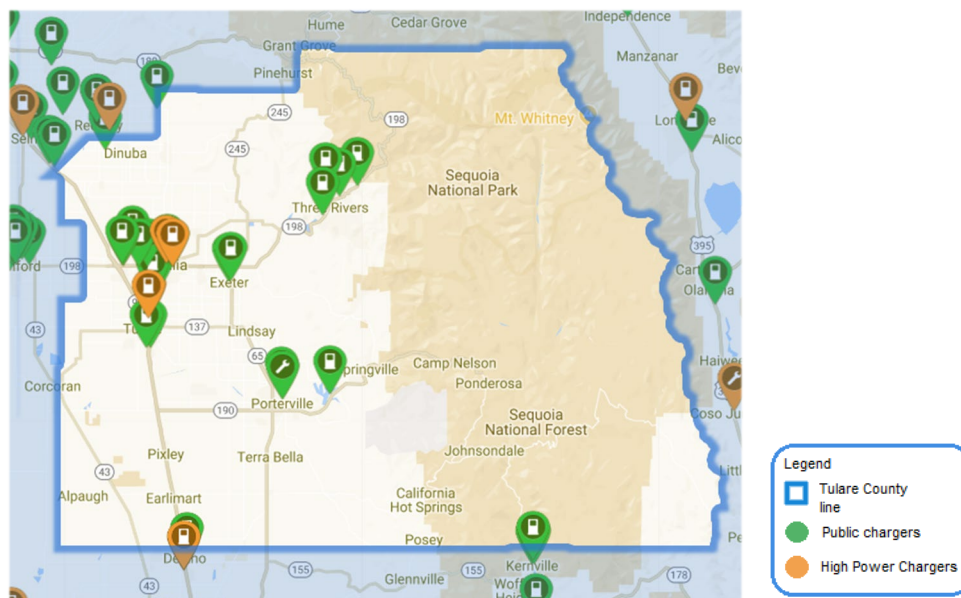


Figure 32 - EVSE in Tulare County¹²⁵

¹²⁴ <https://evadoption.com/ev-market-share/ev-market-share-state/>

¹²⁵ Tulare County outline showing EV charging stations registered in PlugShare

Significant advances have been made to fill the gaps between economic commuter cars with limited range and expensive luxury sedans. The chart below from [PlugStar](#) shows product offerings in the market today:

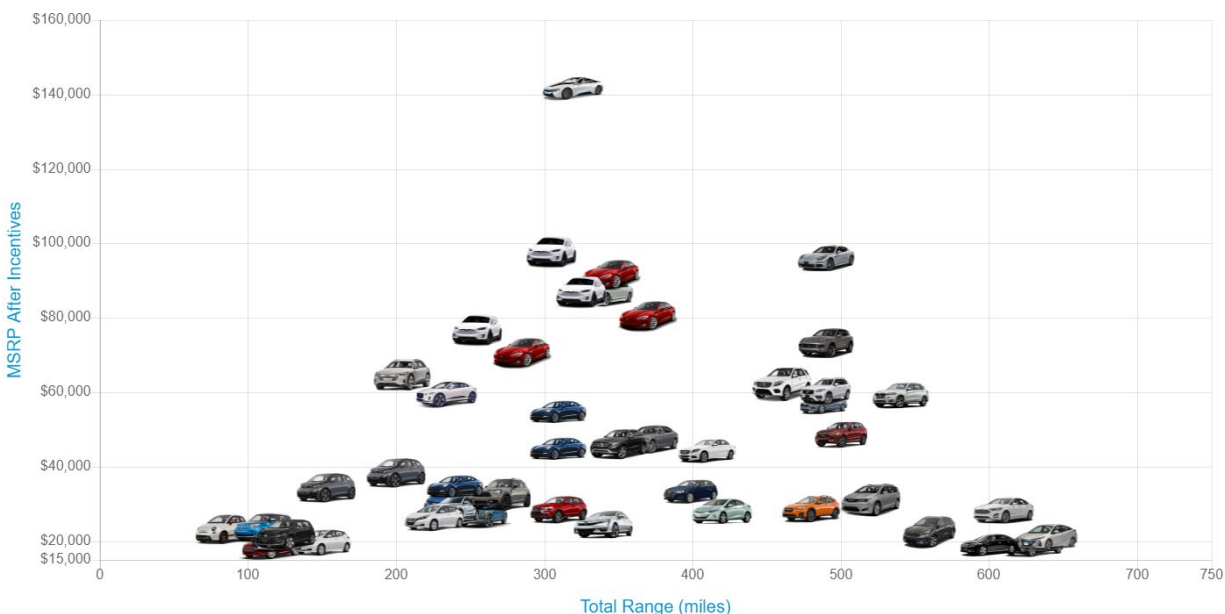


Figure 33 - Range and price of available EVs

PEV prices are falling in almost every vehicle segment, which can meet more of people’s personal transportation needs. Despite lower cost and more accessible PEV options, Tulare County has not adopted PEVs as much as they could have. This can be attributed to low awareness and education about PEVs resulting in lower demand for them. This misperception of PEVs is not unique to Tulare County as nationwide adoption of EVs has been slow. Focused educational campaigns should be implemented throughout Tulare County so consumers better understand the benefits of PEVs, spurring a demand for PEVs and EVSE. Table 3 below presents various opportunities and best practices for Tulare County municipalities to consider as they look to increase public awareness and education about electric vehicles.

Table 27 – Public Awareness Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|--|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | <ul style="list-style-type: none"> The Plan discusses who to target to increase community awareness about EVs and also how to conduct market research and develop a marketing plan towards communities in the San Joaquin Valley The Guide provides a high level overview of different types of PEVs and general statistics about vehicle charging |
| IOU Programs | <ul style="list-style-type: none"> SCE’s Charge Ready program provides online resources for those considering installing EV Chargers at their site including helpful diagrams and flow charts of the entire process PG&E provides an EV Savings Calculator tool on their website to help prospective buyers compare costs of an EV with a similar ICE car. |
| Internet Tools | <ul style="list-style-type: none"> Plugstar provides an online tool to help educate prospective buyers on EV options which fit their needs including a virtual shopping assistant, a comprehensive database and specifications on electric vehicles, local test drive event locator and EV vehicle dealer locator |

| Opportunity | Resources/Best Practices |
|---|---|
| | <ul style="list-style-type: none"> The Department of Energy, Alternative Fuels Data Center, and SCE have all created online calculators to help prospective EV buyers compare the total cost of ownership for EVs and traditional vehicles. These tools can help correct the misconception that EVs are expensive to own. |
| EV Test Driving Options | <ul style="list-style-type: none"> Ride and Drive Events like those done in Sacramento and Minnesota allow potential EV owners to test drive EVs and learn about them from their local community members. EV Car Sharing programs, such as Gig in Sacramento, allow users to rent an EV by the hour or a full day, providing a low-cost and low commitment option to expose people to EVs. |
| Other National, Statewide, and Local Outreach Efforts | <ul style="list-style-type: none"> Electrify America California Cycle 2 Investment Plan describes the investment it plans to make in California over the next two years, including targeting rural communities, and additional outreach efforts and strategies. Valley Clean Air Now provides several services in the San Joaquin Valley to reduce local smog pollution including vehicle replacement programs. This organization can help inform low-income Valley residents of available incentives programs for EVs during their Tune In & Tune Up events. |

Economic Challenges

The San Joaquin PEV Readiness Plan combines Economic Challenges together with Lack of Public Awareness as a barrier to EV adoption across the region, but as a result of stakeholder interviews in Tulare County, (perceived) Economic Challenges associated with an EV and EVSE installations was mentioned so often that we decided to make this a separate category. The majority of stakeholders interviewed had significant areas of their communities which were designated Disadvantaged Communities (DACs). Residents in DACs are often disproportionately affected by the vehicle tailpipe emissions from sources not only in their communities, but the surrounding communities as well, so it is important to address economic challenges that prevent adoption of EVs, especially in DACs.

Stakeholder interviews revealed perceived high economic hurdles for EV adoption in the following areas:

- **High Initial Cost of Purchase.** In 2019, EVs are still more expensive than similarly equipped vehicles in the same vehicle class. However, there are a plethora of local, state, and federal incentives designed to help close this gap and achieve initial cost parity.
- **High Cost of EVSE Installation.** Depending upon the level of charging desired, EVSE installation can be a major electrical project. However, with proper station siting practices as well as leveraging utility incentive programs, investments in EV Charging Infrastructure can be minimized or eliminated all together.
- **High Cost of Operation.** EVs contain energy dense and technologically advanced battery packs which have a high cost if they need to be replaced. However, “fueling” of EVs from the electrical grid (especially at off peak times) and maintenance costs are less than their ICE vehicle equivalent. Advancements are also being made currently on the use of “Second Life” Batteries, batteries no longer fit for use in a vehicle, as stationary grid storage. Once a value has been determined for used EV batteries, this should also help offset the cost of out of warranty battery replacement.



Below is a table of the opportunities available for municipalities within Tulare County to help offset either the initial cost of an EV purchase, the installation of EVSE or ongoing operational costs of EV use. A table showing the use of multiple sources of funding is available in Table 44 and Table 45.

Table 28 – Economic Challenge Opportunities and Resources

| Opportunity | Resources/Best Practices |
|----------------------------------|--|
| IOU Programs | <ul style="list-style-type: none"> SCE's Charge Ready program was a pilot that ended on May 19, 2019 to provide up to \$1,000 in rebates how homeowners to install Level 2 charging stations. No new applications can be submitted at this time, but this program is expected to reopen once new funding is approved by the CPUC. Half of the funding was reserved for DACs. EV-specific rates like SCE's TOU-D-Prime provide low-cost charging rates for EV owners who charge during off-peak hours. Off peak charging is equivalent to paying less than \$2/gallon for gasoline. |
| Local, State and Federal Funding | <ul style="list-style-type: none"> Federal tax credits provide up to \$7,500 in tax credits for purchasing an EV, can be stacked with other incentive programs. CA Clean Vehicle Rebate provides up to \$2,500 in rebates for purchasing an EV in California, currently limited to low-income households until more funding is issued. Rebate issued after verified purchase. CA Clean Vehicle Grant provides up to \$5,000 grants to low-income residents who want to purchase an EV; includes a free home charging station. An application must be filled out prior to purchasing the vehicle and the grant is given to the dealer so the discount is received at the point of sale. Program is currently closed, but new funding has been issued and is expected to reopen. Cannot be stacked with funds from the Clean Vehicle Rebate Project, Rebate Now, Tune in Tune Up, or Replace Your Ride. SCE Clean Fuel Reward Program, provides up to \$1,000 in rebates for purchasing an EV in SCE territory. Rebate issued after verified purchase. Drive Clean provides up to \$3,000 in rebates for purchasing an EV in San Joaquin Valley. Valley CAN provides up to \$9,500 in incentives for low-income households to replace old, polluting cars with EVs. Tulare County receives \$6.1 million in CMAQ funding per year, that is available for transportation projects that improve air quality including electrifying transportation. Applications are competitive and funding allocations are determined by the cost-effectiveness of the projects. |
| Car Sharing | <ul style="list-style-type: none"> These programs allow residents to reserve cars and use them on an hourly or daily basis. Users only pay for the time and fuel they have spent with the vehicle, avoiding monthly payments, maintenance, and insurance costs. Sacramento's Community CarShare program provides up to 3 free hours per day, 9 free hours per week for its zero-emission vehicles. |
| Charging Incentives | <ul style="list-style-type: none"> California's EV Charging Station Financing Program provides loans for the design, development, purchase, and installation of EVSE at small businesses. PACE programs provide financing for property owners to pay for EVSE, loans are repaid through property taxes. Charge Up provides funding for public agencies, businesses, and property owners of multi-unit dwellings to install Level 2 or fast charging stations within SJVAPCD. |



Access for Disadvantaged Communities (DACs) and Multi-Unit Dwellings

The majority of stakeholders stated that a significant portion of the population in their respective cities were considered “low-income.” Stakeholders from smaller cities (Farmersville, Woodlake, and Lindsay), mentioned seeing few, if any, EVs in the area and had not had any EV permit requests from residents. These cities mentioned a “financial gap” being larger than an educational one as a barrier to EV and EVSE access. There was no mention of EVSE infrastructure barriers due to residents residing in MUDs.

Based on the extensive history and breadth of work that Self Help Enterprises (S.H.E.)¹²⁶ has with low-income populations in the San Joaquin Valley region, we had several conversations with representatives to discuss their experience and knowledge on barriers to EV adoption and EVSE implementation amongst disadvantaged communities in Tulare County¹²⁷. Aside from the major cost barrier to EV and EV charger purchases, there is little to no EVSE infrastructure in most DACs. There was mention of areas in Tulare County, considered “transportation deserts,” that lack financial resources to implement EV charging stations, as it may not be a priority.

Initial research findings, based on a 2017 report, *Opportunities for Shared-Use Mobility Services in Rural Disadvantaged Communities in California's San Joaquin Valley: Existing Conditions and Conceptual Program Development*, offered viable opportunities for EV adoption via a pilot carsharing program in affordable housing complexes at three cities in Tulare County; Visalia, Dinuba and Orosi. This program, originally named “Valley Go,” and later renamed “MioCar,” services residents living in the S.H.E. complexes of Sierra Village (Dinuba), Highland Gardens (Visalia) and Sand Creek (Orosi) and is open to the public.

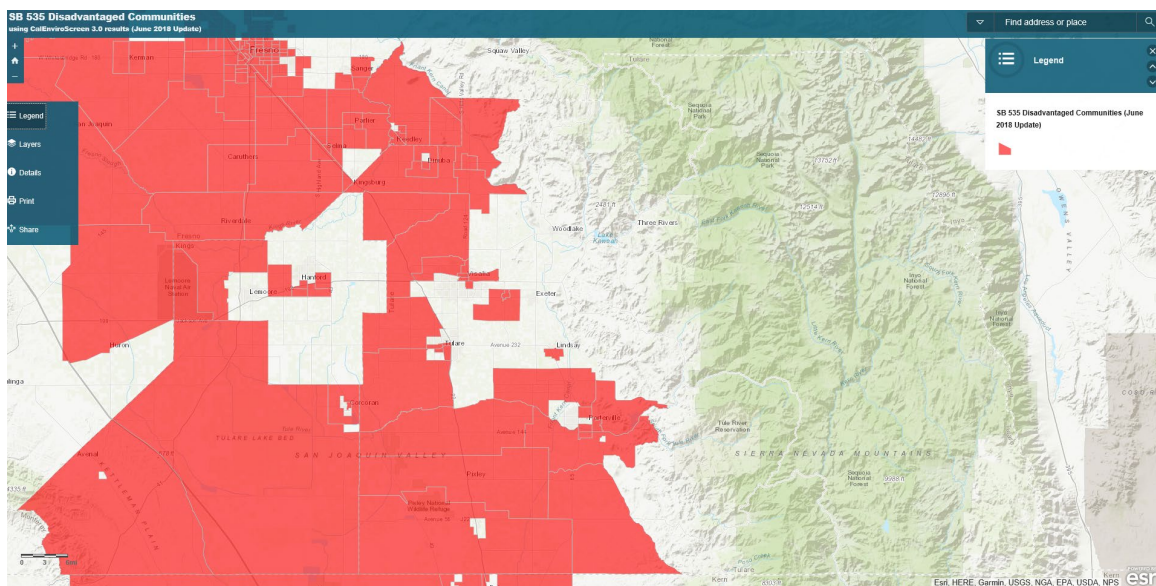


Figure 34 - Tulare County Disadvantaged Communities from CalEnviroScreen 3.0

¹²⁶ Self-Help Enterprises is a nationally recognized community development organization whose mission is to work together with low-income families to build and sustain healthy homes and communities; servicing 8 counties in the San Joaquin Valley <https://www.selfhelpenterprises.org/about-us/#service-area>

¹²⁷ As part of SB 535 and AB 1550, a screening tool was developed to determine areas that are designated as disadvantaged communities (CalEnviroScreen 3.0), taking into account high amounts of air pollution with low income populations.

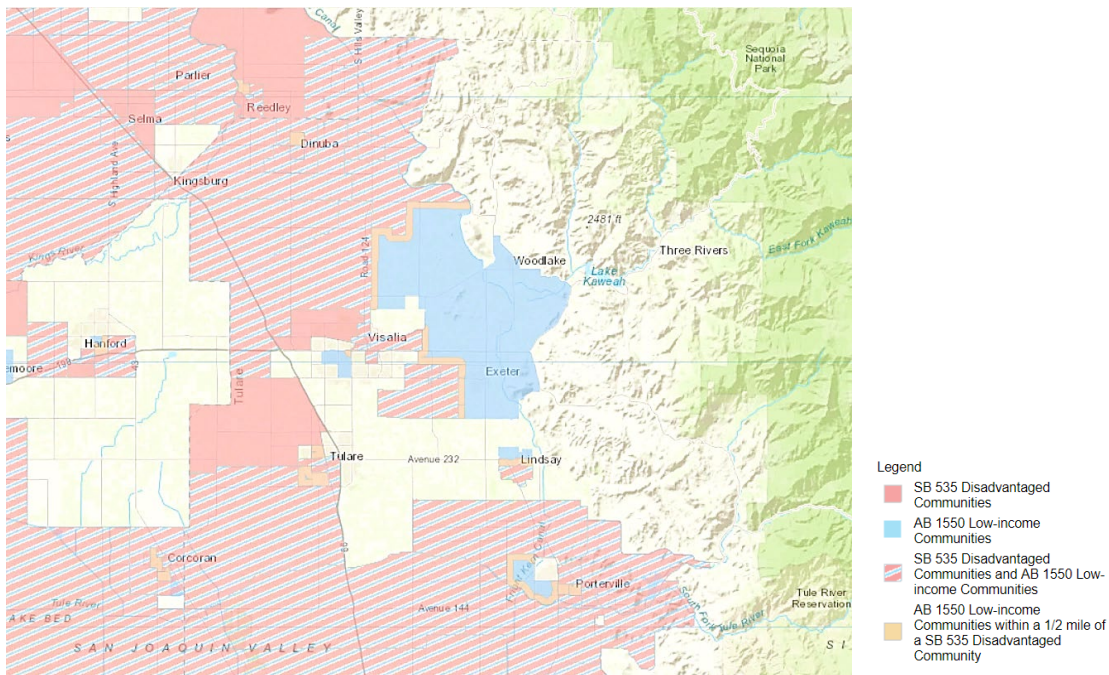


Figure 35 - Map of DACs and low-income communities in Tulare County¹²⁸

Residents of Tulare County who reside in Multi-Unit Dwellings also perceive significant challenges charging their electric vehicles, especially since around 80% of EV owners currently charge their vehicles¹²⁹ at home, commonly in private garages. Larger, multi-unit dwellings may not have dedicated garages or circuits set up to install charging stations. There may also be split-incentives between tenants and landlords to install the necessary EVSE to spur EV adoption. The table below presents opportunities and resources for Tulare County to consider when looking to increase EV adoption equitably at DACs and in Multi-Unit Dwellings.

Table 29 – DACs and MUDs Opportunities and Resources

| Opportunity | Resource/Best Practice |
|--|---|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | <ul style="list-style-type: none"> The plan includes permitting recommendations to require new multi-family residential projects to dedicate a minimum of 5% of their parking capacity with dedicated circuits and panels to facilitate future EVSE installation. This has since been formalized by the 2016 California Green Building Code. |

¹²⁸ 35% of California Climate Investments must benefit what California Air Resources Board (CARB) considers “priority populations.” These populations include disadvantaged communities, low-income communities, and low-income households. This map was developed under AB 1550:

<https://ww3.arb.ca.gov/cc/capandtrade/auctionproceeds/communityinvestments.htm>

¹²⁹ According to the National Office of Energy Efficiency and Renewable Energy

<https://www.energy.gov/eere/electricvehicles/charging-home>

| Opportunity | Resource/Best Practice |
|--------------------------|--|
| Subsidized Car Sharing | <ul style="list-style-type: none"> Commercial subsidized (by grant funds) carsharing service that offers short-term car rentals via phone-app; a car is checked out and returned to the same location. Miocar Carshare program: https://miocar.org/ Miocar carshare is located at 3 S.H.E. complexes (Sierra Village, Highland Gardens and Sand Creek; is membership based and open to the public |
| IOU Programs | <ul style="list-style-type: none"> SCE has created several tools and resources to assist MUD property owners on deciding if and what types of charging stations are appropriate for their specific location. They also provide a collection of rebates, incentives, and rate structures specific for MUD owners to encourage installing EVSE. SCE's Charge Ready program provides support to MUDs to install EVSE with a combination of free infrastructure upgrades and rebates for charging equipment. |
| California Building Code | <ul style="list-style-type: none"> The 2016 CA Green Building Code formally requires MUDs with at least 17 units to designate at least 5 percent of their parking spaces (with a minimum of 1 space) for EVs, of which 1 space must be in a common area. Existing MUDs cannot prevent tenants from installing EVSE. |

Charging Station Siting Guidelines

One of the main components of this EV Implementation Plan will be the development of an EV charging station siting criteria (see Appendix B). Through stakeholder interviews, the Willdan team found that most within Tulare County had not given much thought to where to locate EV stations within their communities and/or where to locate the chargers at suggested sites. To date, they had relied on vendors and other third parties to dictate site selection and charger placement. While this has worked reasonably well to date with the limited number of charging stations installed, we found that lack of knowledge about where to site charger stations is still a significant barrier to expansion of an EV charging network within Tulare County. Furthermore, without a guiding criterion in place, cities within Tulare County may not be able to direct the expansion of their EV Charging network in a way which meets their specific goals such as equitable access to EV Charging or as a key component of economic development. Additionally, stakeholders needed guidance on how to choose what type of charging (Level 2, Level 3/DCFC) to install at various locations.

During stakeholder interviews, each interviewee was asked where they thought that EV chargers should be located within their communities. Without prompting, suggestions were limited in nature and were centered around public charging on public land (city halls) or in obvious commercial centers on private land (malls). However, with some suggested areas to expand into, the site list became much more extensive. Below is a list of site types which may be suitable and beneficial for installing EV chargers.

Public Sites:

- City Hall
- Court Houses
- Municipal Parks / Tourist Attractions
- Libraries
- Police
- Parking Garages
- Public Street On-Street Parking
- Transit Hubs



Private Sites:

- Commercial Sites: Workplace Charging, Office Parks
- Retail Sites: Shopping Malls, Strip Malls, Restaurants and Bars
- Theaters
- Educational Facilities: USDs or Community Colleges
- Museums
- Hotels
- Multi-Family / Disadvantaged Community Sites (addressed separately above)

Below are a few opportunities that Tulare County municipalities can take advantage of when considering EV Charging siting. Additionally, the EV Charging Station siting and site selection criteria that the Willdan team used is included as a reference.

Table 30 – Charging Station Siting Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|---|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | <ul style="list-style-type: none">• The plan has installation guidelines for fleet, residential and nonresidential EVSE that includes considerations for owners, utility rates, contractors, governing and approving authority. |
| IOU Programs | <ul style="list-style-type: none">• While currently limited to MUDs, SCE’s Charge Ready program helps non-residential customers upgrade electrical infrastructure and provides rebates for charging equipment to accommodate EVSE. Once more funding is issued to this program, other commercial locations are expected to be included in this program. |

Parking and Signage

Because Electric Vehicles still require 30 minutes, or longer, to charge, even with Level 3/DC Fast Chargers, providing designated parking for charging is a requirement of successful EV charging network implementation. Clear signage that directs EV drivers where to park and charge helps ensure a positive and safe user experience. Conversely, the same clear signage also denotes where non-EV drivers cannot park to ensure spots are left open for EV charging.

Stakeholder interviews within Tulare County and site visits of existing EV chargers within Tulare county indicate that EV specific signage and designated parking for EV charging is well understood and not a significant barrier to implementation at this time. Vendors who have installed EV chargers have provided adequate signage and designation of EV-only parking.

However, as EV ownership increases in Tulare County, there is the potential for parking and signage to become a barrier due to an inconsistent application of codes and policies which determine how many spots should be designated as EV charging in a new or resurfaced parking lot. Additionally, there is potential for unclear parking enforcement policies to adequately enforce EV charging-only restrictions allowing non-EV vehicles to occupy spaces needed for EV charging.





Figure 36 - EV/Disability Parking signage at City of Visalia Administration parking lot

Therefore, the team has compiled a list of resources detailing out current parking codes and policies which carve out EV charging spaces as part of a parking lot construction as well as innovative parking enforcement policies which ensure EV charging spaces remain free of non-EV vehicles.

Table 31 – Parking and Signage Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|--|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | The readiness plan provides sample parking and signage examples Tulare County can use to identify EV charging stations, EV spaces, and EV parking restrictions. These examples can then be modified to meet Tulare County’s specific needs and requirements. |
| CA Plug In Collaborative | California Plug in Vehicle Collaborative provides sample EV parking and charging signage. |
| Update Parking Policies | The City of Santa Monica’s EV Action Plan provides insight into the driving legislation used to standardize signage, revise parking policies for EVs and justify parking enforcement for EV Charging. |

Building Code for PEV Charging

The 2014 San Joaquin Valley EV Readiness Plan notes that most of the areas within Tulare County have not adopted unique requirements for EVSE charging and are in various stages of considering specific policies. The EV Readiness Plan noted that local governments would like to reference other local municipal EVSE codes when developing their own local codes. During our stakeholder outreach and interviews, this was not identified as a major barrier to EV adoption in the region. Tulare County; however, can be proactive about this issue and start designing building code now to be prepared for EVs in the future.

Table 32 – Building Code Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|---|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | <ul style="list-style-type: none"> The Plan provides issue background and key issues surrounding Building Code’s role in supporting EV Charger installations. The Plan provides recommendations for how local governments can use building code to encourage PEV charger installations by requiring provision for the future installation of EV Chargers and designation of dedicated places for EV parking. |
| Legislation | <ul style="list-style-type: none"> California Assembly Bill 1092 (2013) required that the next version of California Building Standards Code to publish mandatory building standards for the installation of EVSE for parking spaces in MUDs and nonresidential buildings. |
| Local Government Best Practices | <ul style="list-style-type: none"> Santa Clarita County provides resources which are designed to help other local governments play an important role in the development of public and private EV charging infrastructure due to their authority over zoning, parking signage, building codes and permitting. This includes an EV Best Practices Compendium, and a Webinar on EV Charging Infrastructure as Novel Land Use. |
| CALGreen | <ul style="list-style-type: none"> The 2016 CALGreen Building Codes and Standards mandated the designation of parking spaces as Clean Air/Vanpool/EV when constructing new parking lots. Additionally, it makes provisions for the installation of EVSE related infrastructure (see p.68 for more info). This is explained in further detail on p. 66. |

Zoning Policy for EVs

The 2014 San Joaquin Valley EV Readiness Plan notes that zoning policy can be a barrier to EV Charging infrastructure installation across the region. Unclear or non-specific zoning policies, which do not specifically call out EV charging as an allowed land use can lead to delays in approval of permits for EV charger installations.

In talking with stakeholders within Tulare County, the Willdan team specifically asked about perceived challenges with zoning related to the installation of EV chargers. None of the recipients interviewed voiced concerns with regard to specific zoning for EV charger installations. However, the below table outlines some of the opportunities and industry best practices for Tulare County to emulate should zoning become a barrier to installing EV charging.

Table 33 – Zoning Policy Opportunities and Resources

| Opportunity | Resources/Best Practices |
|---|--|
| San Joaquin Valley Plug-in Electric Vehicle | <ul style="list-style-type: none"> The Plan provides issue background and key issues surrounding Zoning Policies for EV Charger installations |



| | |
|--|--|
| Readiness Plan and Guide | <ul style="list-style-type: none"> The Plan provides recommendations for how local governments can use zoning to encourage PEV charger installations by coordinating with subsequent parking space zoning requirements and provisions. The Plan provides a sample zoning code provision for EV Charging Stations in the appendix. |
| Local Government Best Practices | <ul style="list-style-type: none"> Santa Clarita County provides resources which are designed to help other local governments play an important role in the development of public and private EV charging infrastructure due to their authority over zoning, parking signage, building codes and permitting. This includes an EV Best Practices Compendium, and a Webinar on EV Charging Infrastructure as Novel Land Use |
| Industry Groups | <ul style="list-style-type: none"> California Plug in Vehicle Collaborative provides example EVSE configurations and guidelines Tulare County can use for a variety of settings including parallel, diagonal and perpendicular curbside charging, and off-street charging. |

Permitting and Inspection

Because EV Chargers are attached to existing or new electrical infrastructure to draw power from the electrical grid, permits are typically required for a successful installation. If a municipality does not have a clear permitting process in place or installing contractors do not know about the process, this can be a significant barrier to EVSE installation.

In 2014, the San Joaquin Valley EV Readiness plan found that there was no regionwide standards for permitting EVSE installations and that many jurisdictions required multiple permits and different permitting fees for approval of an EVSE installation by the Authority Having Jurisdiction (AHJ) over the project. Subsequently since this report, [California Assembly Bill 1236](#) was approved, requiring a streamlined process for EVSE installation permitting.

Stakeholder interviews revealed no specific concerns regarding the permitting process for EVSE installations nor any specific streamlined process for the permitting of EVSE installations. Of those cities who did their own permitting (the County is responsible for Farmersville and Exeter), the general opinion was that their inspectors had sufficient knowledge to permit EVSE installations. The same held true for the County who is also responsible for permitting in Farmersville and Exeter. The City of Lindsay outsourced their engineering and permitting to firms like Willdan, and had no concerns that their on-call Engineers would have trouble reviewing and approving EVSE installations. Below is a table of entities that handle permitting around Tulare County.

Table 34 – AHJs in Tulare County

| Municipality | Permitting AHJ |
|----------------------|---|
| City of Dinuba | Use of third party |
| City of Exeter | County |
| City of Farmersville | County |
| City of Lindsay | Simple permits by the City; Complex permits are outsourced to third parties (e.g. Willdan) |
| City of Porterville | City |
| City of Tulare | City |
| City of Visalia | City |



| | |
|------------------|---|
| City of Woodlake | City |
| County of Tulare | Permitting for County Facilities only; County handles Exeter and Farmersville |

However, this report is providing resources and recommendations for further streamlining the permitting process across the region to help support the expected increase in EV Charger installations. Best practices can be seen in the table below.

Table 35 – Permitting and Inspection Siting Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|--|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | <ul style="list-style-type: none"> The Plan provides issue background and key issues surrounding Permitting of EV Charger installations The Plan provides a general idea of installation scenarios and the different permits required The Plan makes recommendations to streamline the permitting process for EVSE installations |
| Industry Publications | <ul style="list-style-type: none"> Plug-In San Diego published a report in June 2016 as a guide for local governments to streamline and standardize their EVSE Charging Permitting Process. This includes addressing permitting fees, developing checklists, standardizing review times and providing clear points of contact for permitting questions. This resource has helpful appendices which provide sample templates for permitting inspection checklists, plan review correction sheets |
| Legislation | <ul style="list-style-type: none"> California Assembly Bill 1236 (2015, Chiu) requires all cities and counties to develop a streamlined permitting process for EV charging stations by September 30, 2017 The California Building Officials (CALBO) organization have published a toolkit for large and small jurisdictions providing sample checklists, staff reports, model ordinances and timelines |

Training for Electrical Contractors

EVSE installations, especially where DCFC or large numbers of chargers are installed, require specific skillsets and knowledge of electrical codes to be installed safely and in compliance with regulations. Contractors need to be technically savvy with regard to EVSE installations and be able to communicate with the site owners, charging station manufacturers and local government officials to facilitate a smooth install. Because EV chargers have the potential to significantly increase the load on a facility, installing contractors need to also be able to assess the electrical requirements for the planned installation including existing electrical capacity at a site. They should be knowledgeable in estimating the cost of an electrical upgrade and be able to facilitate the permitting process to complete the installation inspection. Without this experience or certification, electrical contractors could introduce significant project delays as they unsuccessfully try to permit EVSE installations or, worse, endanger the general public with an improperly located or installed EV charger.

Stakeholder interviews, conducted by Willdan, revealed that most municipalities within Tulare County do not see electrical contractor training as an issue at this time. Contractors who had installed Level 1 or 2 EVSE to date have successfully permitted their installations and successfully completed their installs. Porterville was the lone exception noting that because of their participation in SCE's Charge Ready Transport Pilot program, "a lot of learning" was happening through the engineering, design and permitting process for the DCFC installed as part of



this program. As part of the design services SCE offered as part of this program, its engineers were working the appropriate jurisdictions through the permitting process.

Porterville’s experience with more complex EVSE installations is indicative of the challenges that others in Tulare County will face as they install more EV Chargers. Additional contractor training will be necessary so they can understand the applicable codes, tools, site capacity, siting and permitting requirements for an EVSE installation. Therefore, we are providing helpful resources for this information should the need for electrical contractor training become a more widespread issue in the future.

Table 36 – Electrical Contractor Training Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|---|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | <ul style="list-style-type: none"> The Plan provides issue background and key issues surrounding Electrical Contractor Training for EV Charger installations The Plan provides additional skillsets which Electrical Contractors will need in order to successfully install an EV Charger. The Plan provides resources for organizations who provide EVSE training such as the IBEW. |
| Workforce Training Programs | <ul style="list-style-type: none"> The Electric Vehicle Infrastructure Training Program provides training to electrical contractors interested in learning how to install EVSE. It also provides a list of EVITP certified contractors if municipalities in Tulare County are looking for certified installers. |

Workplace Charging

The San Joaquin Valley EV Readiness Plan notes that workplace EV charging can help EV drivers overcome the educational barrier of “range anxiety” allowing them to charge while they work, typically for extended periods of time and prepare their vehicles for the return trip home. As shown in this graphic (Figure 37) from a [recent DOE study on EV range](#), in 2018, median EV range is now around 125 miles, which slightly decreases the need for workplace charging, especially for long commuters (60+ miles) who can charge at home.

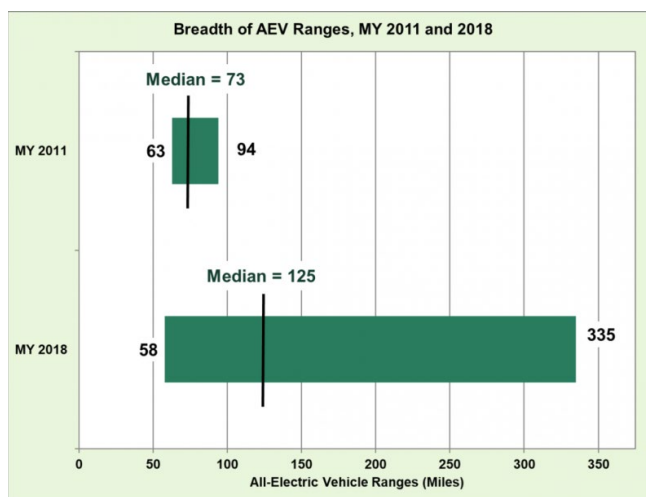


Figure 37 - Median EV ranges between Model Year 2011 and Model Year 2018 Vehicles



Stakeholders interviewed had a very clear ideas where large local employers were located and were able to suggest their sites as potential candidates for installation. Unfortunately, most employers parking lots were private property and the specific employer would need to be involved in the installation of EV chargers as well as the decision on whether these chargers would be available to the general public or just their employees. For the purposes of this TCAG EV Implementation Study, our priority was choosing sites where chargers would be publicly available, although employers who are interested in installing EV chargers can easily use the content generated here to better understanding station siting, permitting, and incentives available to them to offset the cost of providing EV charging for their employees.

Table 37 – Workplace Charging Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|--|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | <ul style="list-style-type: none"> Provides issue background and case for employers to offer workplace charging Raises key issues for employers to consider before embarking on installation of workplace EV charging. Provides installation guidelines for employers to consider when installing workplace charging. |
| IOU Programs | <ul style="list-style-type: none"> SCE provides resources to employers who are considering installing EV chargers including surveys to gauge interest in workplace charging, details about EV charging infrastructure and Transportation Electrification Advisory Services, as well as special rates to minimize the impact of EV charging on a businesses bottom line. Employers in SCE Territory can also participate in SCE's Charge Ready Program (pending CPUC approval) which provides customers with assistance in installing EV Chargers at their location. Assistance includes pre approved lists of vendors and equipment to be installed, site scoping, design assistance, construction support and financial incentives to offset or cover the costs of the EV Charger Infrastructure PG&E had a workplace EV Charge Network program which offered incentives for employers to install workplace charging. However as of publication, this program is fully subscribed. |
| Workplace Charging Incentive Programs | <ul style="list-style-type: none"> CALSTART's Charge to Work NY program is a good example of where properly aligned incentives can help employers install EV chargers and employees save money on commuting costs by switching to an electric vehicle. The program further incentivizes employees to charge off-peak by offering additional savings. |
| Government Publications | <ul style="list-style-type: none"> The US Department of Energy published a Plug-In Electric Vehicle Handbook for Workplace Charging Hosts in 2013 which provides guidance and benefits to employers considering installing workplace charging. |

Fleet Electrification

As pointed out in the San Joaquin Valley EV Readiness Plan, electrification of fleets can be a particularly challenging topic with many potential barriers to implementation. However, electrifications of fleets can also be a significant source of air pollution reduction, which disproportionately affects those located in disadvantaged communities (DACs) as those found in Tulare County. For the purposes of this study, fleet electrification was specifically excluded, but the following advances in this area are worth noting since 2014:

- The California Air Resources Board has issued their [Innovative Clean Transit](#) Ruling, requiring transit agencies in California to fully convert their bus fleets to Zero Emissions Vehicles (ZEVs) by 2040. Phase in of ZEVs must begin by 2026, and only ZEV transit vehicles may be purchased from 2030 and beyond.



- SCE has committed \$356M to assist with transit fleet conversion through expansion of their [Charge Ready Transport](#) program beyond its Pilot phase. Similar support to what Porterville has received is expected to continue statewide to facilitate a successful conversion.
- Cities within Tulare County have started to integrate plug in electric vehicles (PEVs) into their fleets on a limited basis. Porterville has committed to converting its fleet to align with California’s Climate plan, for example. However, there is a large financial hurdle to overcome to convert their fleets to fully electric vehicles. Additionally, EV market offerings have not yet caught up with all the vehicle types owned and operated by a city. Specifically, absent at this time is a reliable, cost effective light duty work truck, although major manufacturers are currently talking about offering such a product in the next 1-3 years.
- There are now numerous firms and calculator tools specifically working to guide municipalities through the feasibility study and development of a business case for fleet electrification. These efforts can often be subsidized by local, state and federal money to offset the cost of such a study.

Table 38 – Fleet Electrification Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|---|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan | <ul style="list-style-type: none"> • Provides key issues summary for converting a standard fleet to EV bringing awareness to the issue. • Provides examples of fleet electrification in the San Joaquin Valley which can be resources to those in Tulare County • Provides high level recommendations on how fleet managers should begin to assess benefits of fleet electrification |
| IOU Programs | <ul style="list-style-type: none"> • SCE’s Charge Ready Transport Program dedicates funding to help public agencies electrify their fleets. SCE designs and installs EV charging infrastructure, chargers, and meter at no cost to customer to support fleet electrification. Their EV-specific rate tariffs have a moratorium on demand charges for 5 years while fleet operators learn how to manage and optimize fleet charging. |
| Financial Incentives | <ul style="list-style-type: none"> • California’s Hybrid Truck and Bus Voucher Incentive Project (HVIP) provides incentives for the purchase of new cleaner fuel trucks and buses, up to \$150,000 off the purchase of a new Battery Electric Bus • San Joaquin Valley Air Pollution Control District has incentives available to help offset the cost of Level 2 and Level 3 Chargers through their Charge Up! Program |

Utility System Impacts and Rate Design

In the 2014 San Joaquin Valley EV Readiness Plan, it was noted that utilities in the region had a role to educate customers about EVs and the benefits of their use, provide cost-effective charging options, ensure grid reliability and support charging infrastructure. Looking at the support that both PG&E and SCE are providing to EVs currently, there is every indication that they have stepped into this role and are supporting EV adoption and charging network expansion in a major way.

SCE’s Charge Ready Program provides resources for educating customers, a special EV Charging Time of Use (TOU) rate, and even a moratorium on demand charges for 5 years while customers learn how to manage the increase in site demand due to EV Charging. This program also provides funding and resources to install the in-front of the meter, a dedicated EV charging meter and behind the meter infrastructure to support EV charger installation at sites ranging from residential to small and large commercial. PG&E has a similar offering as they are the utility provider for Dinuba and other unincorporated areas along the northern edge of Tulare County.



Interviewed stakeholders in Tulare County who were aware of these programs were extremely grateful for the support offered by the IOUs, but did note that the minimum barriers to entry of 5 (DAC only) or 10 EVSE installations per site were high for their needs at this point in time. Specifically from Porterville, who had participated in SCE's Charge Ready Transport Pilot program, they commented that a longer-than-expected design and installation process had left their grant-funded buses unable to charge or be used for an extended period of time while they were waiting for the EV charger installation projects to complete. The table below provides helpful resources and best practices for Tulare County to draw upon when considering Utility System Impacts and Rates related to EV Charging.

Table 39 – Utility System Impact and Rate Design Opportunities and Resources

| Opportunity | Resources/Best Practices |
|--|--|
| San Joaquin Valley Plug-in Electric Vehicle Readiness Plan and Guide | <ul style="list-style-type: none"> The Plan provides an overview of the key issues surrounding Utility Rates for EV Charging. Since publication, SCE and PG&E have addressed many of these issues in their EV Program Offerings and specific EV rate designs. |
| IOU Rates | <ul style="list-style-type: none"> SCE's Charge Ready Transport Program dedicates funding to help public agencies electrify their fleets. SCE designs and installs EV charging infrastructure, chargers, and meter at no cost to customer to support fleet electrification. SCE's EV-specific rate tariffs have a moratorium on demand chargers for 5 years while fleet operators learn how to manage and optimize fleet charging. They also have rate structures designed to incentivize users and charging station owners to save money by charging during off-peak times. |

Overview of Best Practices

Through our research, the Willdan team found various programs designed to educate customers about electrical vehicles, and their current attributes. There are several best practices and effective strategies when it comes to EV implementation and adoption of EVs. First off, with the revisioning of transportation-as-we know it, public focus has shifted to include a social justice aspect to vehicle electrification. Since residents in DACs are often disproportionately affected by vehicle tailpipe emissions, vehicle electrification not only hopes to reduce these harmful pollutants, but also provide more affordable and accessible clean transportation. This can be seen through efforts like Self Help Enterprises' EV carsharing programs at multi-unit dwellings/low income housing within Tulare County. There are many strategies and programs available that Tulare County can use to overcome the barriers from the earlier section of this report. The following table summarizes different strategies, where to locate the resource, and identifies which barriers it helps to overcome. Then each resource is discussed more fully on how it can help Tulare County increase EV adoption.

Table 40 – Overview of Best Practices

| Program Name | Synopsis | Barriers it helps to Overcome |
|---|--|--|
| San Joaquin Valley EV Readiness Plan and Planning Guide | Provides a variety of strategies and resources to assist local governments in the San Joaquin Valley to increase EV adoption | Public Awareness, Zoning Policy for PEVs, Parking and Signage, Permitting and Inspection |



| Program Name | Synopsis | Barriers it helps to Overcome |
|--|---|---|
| Car Sharing Programs: Mio Car ; Sacramento CarShare | Mio Car provides a car sharing service for local multi-unit dwellings and nearby residents; Mio Car has various features (i.e. ADA adaptive controls) and services (i.e. insurance for drivers/car) included in their program; Sacramento CarShare provides low cost options for residents to use a vehicle in lieu of owning their own | Public Awareness, Economic Challenge and Charging in MUDs |
| Valley Clean Air Now | Provides incentives to low-income to replace highly polluting cars with EVs | Public Awareness, Economic Challenge |
| SCE Charge Ready | Provides infrastructure needed to support EVs, provides rebates for chargers | Public Awareness, Economic Challenge, Charging in MUDs |
| Electrify America | Installs public DC fast charging stations, promotes EVs throughout the country | Public Awareness |
| Direct Financial Incentives: Federal tax credits , CA Clean Vehicle Rebate , SCE Clean Fuel Reward Program , Drive Clean | Rebates, discounts, and tax credits to reduce purchase price of EVs | Economic Challenge |
| Charging Incentives: SJVAPCD Charge Up , TOU EV rates | Rebates, discounts, and tax credits to reduce purchase price and installation costs of EV charging stations. Specific EV residential rates to reduce charging costs. | Public Awareness, Economic Challenge |
| Non-Financial Incentives | Provides additional, non-financial, benefits to EV ownership including access to HOV lanes, | Public Awareness |
| Ride and Drive Events | Allows community members to get behind the wheel of and learn the benefits of EVs | Public Awareness |
| Self Help Enterprises (S.H.E.) | Creating outreach plans and materials for residents at S.H.E. complexes and local CBOs | Public Awareness, Economic Challenge |
| California Green Building Code | Requires new MUDs and commercial spaces to set aside parking spaces for EVs. Tenants cannot be prohibited from installing EV chargers in existing MUDs. | Public Awareness, Charging in MUDs, Parking and Signage |
| Siting Selection and Analysis | Guidelines on how Tulare County can evaluate different options for public charging stations | Siting Chargers |

San Joaquin Valley Plug-In Electric Vehicle (PEV) Readiness Plan and Planning Guide

The San Joaquin Valley PEV Readiness Plan highlighted several areas where consumers show a gap in knowledge about EVs and EVSE that are consistent with what we have found in our research overall. As a result, several of the strategies identified in that plan are useful to Tulare County. Some opportunities to educate the community about EVs include at local car dealerships, utility websites, local municipality websites and community events.



San Joaquin Valley's EV plan identified that car dealerships are not very well educated in available incentives and typically referred potential buyers to SJAVPCD's website for incentive information. When a potential EV buyer does not have all of the available information readily available, they are less likely to purchase the EV. This made it more difficult for potential EV buyers to be aware of all the potential incentive sources and decreases the likelihood of someone from purchasing an PEV. Tulare County can work with SJV PEVCC and SJVAPCD to create a dealership educational program.

Our research and outreach showed that municipal governments are also not well educated on PEVs and EVSEs which may make it difficult for them to create educational materials and conduct outreach efforts. Municipal governments can easily create a page on their websites with a collection of online PEV resources directing people to PEV utility programs, state incentive programs, and general PEV information, including but not limited to the sources identified in this report. Municipal staff can then self-educate themselves on the available programs. If municipal government staff want additional education about EVs and EVSE they can work with SJV PEVCC, SCE and other partner organizations to host Clean Vehicle Rebate Workshops and other educational events so municipal staff feel more comfortable discussing EVs in their communities. Then, flyers and other educational material can be made available in city halls and other consumer facing city offices that are most applicable to their local communities.

Even though during Willdan's research we found that parking and signage, zoning policies, and permitting were not identified as major barriers, Tulare County should be proactive about these issues so they do not become barriers as more EVs are used in the region. The San Joaquin EV Readiness Plan provides example EV and EVSE related signage used throughout the region and California. The [California Plug in Vehicle Collaborative](#) is another resource for signage options. These examples can then be customized to meet Tulare County's specific parking needs. The plan references CA building code and EV space requirements, which is discussed more in depth in the California Building Code Section.

The San Joaquin EV Readiness Plan describes how permitting for EVSE should be a simple and transparent process when possible. Municipalities should collaborate with each other to ensure that the permitting process is consistent and ideally similar to other permitting processes in the San Joaquin Valley and the rest of California. Given that most charging occurs at home, EVSE permitting for single-family homes should be particularly simple, low-cost, and online if possible. Municipalities with higher levels of MUDs and public charging opportunities can customize their permitting processes to meet those specific needs. The plan also discusses creating a communication channel with the local utility to expedite EVSE permit notifications and processing. As municipalities find successful permitting processes, they should be shared throughout the county.

The San Joaquin Valley EV Readiness Plan recommends that Level 1 and Level 2 charging be seen as an accessory land use, thus requiring only an electrical permit to install. Additionally, it recommends that cities clearly define EV chargers as a permitted use or provide specific direction as to the land use type (primary or accessory) for EV chargers, especially when it comes to Level 3 / DCFC to better guide planners on which permits are needed for installation. Cities can also create specific zones which have a streamlined permitting process in order to encourage EV charger installations in certain locations which are in accordance with local planning goals.

Self Help Enterprises (S.H.E.) Outreach

S.H.E. partnered with Mobility Development to support with site selection for Miocar, the San Joaquin Valley carshare program (originally called *Valley Go*). Their experience and knowledge of working with the residents from their rental communities and local community-based organizations (CBOs) gives them greater visibility on strategic outreach methods that are effective and community-centered. S.H.E. has a designated person that is developing outreach material and strategies to inform residents of the three participating rental communities Sierra Village, Highland Gardens and Sand Creek; as well as reaching out to CBOs in neighboring areas.

SCE Charge Ready



The SCE Charge Ready program is designed to deploy infrastructure to accommodate EV adoption. Based on current funding amounts, it is only accepting applications for MUDs - which is applicable to many communities within Tulare County. Additional funding is expected to be added to this program and increase the quantity of qualifying sites including commercial and public sites. This program provides infrastructure upgrades free of charge and offers rebates on eligible charging stations. SCE will work with applicants on their specific infrastructure needs based on the EV demand expected at that site. Normally this program requires a commitment of 10 charging stations, though this is reduced to 5 in DACs to reduce that cost barrier. This program includes EV specific rate schedules to encourage charging during lower-cost, off-peak times.

SCE's Charge Ready Transport program is still open for transit operations within Tulare County. Similar to the MUD services, SCE will work with transit agencies and provide free infrastructure upgrades for those that look to electrify their fleets.

Educational material for the SCE Charge Ready Program should be included with other educational material and targeted to MUDs within Tulare County. SCE in general has developed a significant amount of content for educating residential customers on EVs and is a valuable resource for educating customers on charging incentives, EV specific rates, and the benefits of EV ownership.

Electrify America

Created as a result of Volkswagen's emission settlement, Electrify America has installed many DC Fast charging stations throughout the country to reduce range anxiety. Electrify America is currently starting its California Cycle 2 ZEV Investment Plan which includes a focus on rural and low-income communities. Electrify America plans to include residential charging stations in this investment cycle and offers a no-money-down option to increase accessibility to low-income households. They are dedicating \$2-3 million to support education and awareness efforts in low income and DACs throughout California, as well. Tulare County can reach out to Electrify America to coordinate public outreach events and attend PEV workshops.

Electrify America has also partnered with Walmart and is focusing on rural parts of the US to increase access to EV charging stations. As of April 2018, Electrify America has installed 120 charging stations at participating Walmarts near major highways and is slated to install 180 more in the upcoming months. Tulare County has two participating Walmarts in the City of Tulare and Dinuba. The County has three Walmart stores in Visalia and one in Porterville that are also eligible to participate in this program. We spoke with a representative from Electrify America that encouraged [submissions](#) for site location suggestions, as they are accepting them on a rolling basis.

Valley Clean Air Now

This non-profit helps low income residents in Tulare County replace old highly polluting vehicles with newer, cleaner vehicles including electric vehicles. The program provides incentives for low-income drivers who have cars from 1999 or earlier that do not pass smog checks to purchase newer plug-in hybrid vehicles or electric vehicles. The incentive amount is proportional to the participants need (based on household income level), as well as the type of vehicle being purchased (EVs have a greater incentive than plug-in hybrid vehicles). They also help participants receive other financial incentives. Many residents in Tulare County already use Valley Clean Air Now's other services including free smog checks. This provides an ideal partnering opportunity to leverage their relationship in the community and expand access to PEV materials. As an example, a PEV workshop can be hosted in conjunction with one of their *Tune In, Tune Up* events.

Ride and Drive Events

Ride and Drive Events have been hosted throughout the country to great success about raising awareness of PEVs in areas including [Sacramento](#) and [Minnesota](#). It can be implemented on smaller, local scales or larger scales as needed for the size of the target audience. These events give people a chance to learn about PEVs from other PEV owners and drive one for themselves. Prospective PEV buyers can learn how their neighbors and community



members went about purchasing and regularly charging their vehicles and could reinforce available incentive programs.

Direct Financial Incentives

Directly lowering the purchase price of PEVs has shown to be the most effective method of spurring PEV adoption and there are several options to accomplish this. In a 2018 study done by the [National Association of State Energy Officials and Cadmus](#) cash rebates at the point of sale were *the* most effective influence on a customer's decision to purchase an EV vs all other programs, particularly for low income buyers. Even though PEVs typically cost less to own and operate over its lifetime than a conventional ICE vehicle, low-income households may lack the capital needed for the upfront expense. These methods directly lower the purchase price of the vehicle and reduce one of the largest barriers for low income communities. There are a variety of existing funding sources available Tulare County can connect its residents to help them purchase EVs. Tulare County can also negotiate discounts with dealerships as part of promotional efforts or coordinate bulk purchases of vehicles with manufacturers. In an effort to provide the greatest benefit to DACs, rebates and discounts should be prioritized or increased for low-income households.

Rebates issued after the point of sale, such as the [CA Clean Vehicle Rebate](#), San Joaquin Valley [Drive Clean](#) and [SCE Clean Fuel Reward Program](#) are the next most favorable financial incentive. If the rebate process is simple, transparent, and can be issued quickly after the point of sale, this can effectively reduce the purchase price of a vehicle. The more complicated the rebate process, and the longer it takes to issue the rebate, the less effective this method becomes. Finally, [federal tax credits](#) have been influential in spurring EV adoption. EV buyers still need to come up with the total purchase price up front, but they could see a significant tax discount at the end of the year. However, some EV make and models no longer qualify for the \$7,500 tax credit and only qualify for a \$3,750 tax credit. It should be recognized that this may be less effective for low-income households because they may not carry enough tax liability to claim the entire credit, and their incentive is effectively reduced. Other smaller financial incentives could include exempting sales tax on EVs, or reduced registration fees.

Using a combination of these strategies, the purchase price of EVs can be lowered substantially. [Minnesota](#) was able to offer EVs at 40-50% below retail price through a combination of a bulk buy program, manufacturer's discount, and the federal tax credit.

Charging Incentives

A significant barrier to owning an EV is having reliable access to affordable charging. The majority of charging is done at home and both SCE and PG&E have developed specific rate schedules for EV owners to incentivize charging during low-cost off-peak times. Tulare County can complement these rate schedules by partnering with utilities, charging companies and other turnkey installers to facilitate the distribution of subsidized smart chargers that allow an EV owner to program when the charger actually charges the vehicle. This type of technology can allow EV owners to plug in their vehicle any time they are home, but still take advantage of only charging during off-peak hours. This type of charging incentive is primarily applicable for EV owners that can put a charger at their primary residence.

Beyond charging at home, common charging locations include work, and public spaces. Tulare County can also facilitate the same type of partnerships with employers in DACs to provide the same charging benefits for their employees. Tulare County should direct employers and commercial property owners to EVSE installation incentive programs like the [SCE Charge Ready](#) program and [SJVAPCD Charge Up](#) or turnkey installers who will cover a majority of the cost of the installation or encourage charging providers to provide subsidized charging in DACs.

Non-Financial Incentives



In conjunction with the financial incentives previously mentioned, municipal governments can offer non-financial incentives that make EVs a preferential purchase over a gas-fueled vehicle. Some options include: free or preferential parking in public areas and airport preferential drop off and pick up zones. The county can develop an EV "[Bill of Rights](#)" as seen here in this sample document from PlugIn America. While this would not be enforceable legislation, it shows good faith that the local government is supportive of PEV owners and adoption.

Car Sharing Programs

Even with other financial incentives and charging availability, some low-income households may not want to or be able to purchase a vehicle. Car sharing programs eliminate the need for a household to purchase a vehicle at all. Residents can rent vehicles near their primary residence to get to work or run errands. These types of programs must be accompanied with a large educational campaign to explain how car sharing works and why it may be beneficial for a particular area. These programs are particularly useful in areas that are not served well by public transit.

California Building Code

The [2016 CALGreen code](#) has adopted formal building code standards to help spur EV adoption. Specifically, new nonresidential construction or alterations, that add 10 more parking spaces, must designate a minimum number of spaces for EVs and other clean air vehicles in accordance with Table 5.106.5.2 (Figure 38). Furthermore, the new code requires a minimum number of EV charging spaces in new nonresidential construction in accordance with Table 1.106.5.3.3 (Figure 39).

| TOTAL NUMBER OF PARKING SPACES | NUMBER OF REQUIRED SPACES |
|-----------------------------------|------------------------------|
| 0–9 | 0 |
| 10–25 | 1 |
| 26–50 | 3 |
| 51–75 | 6 |
| 76–100 | 8 |
| 101–150 | 11 |
| 151–200 | 16 |
| 201 and over | At least 8 percent of total |

Figure 38. Designated parking for clean air vehicles from 2016 CALGreen code¹³⁰

¹³⁰ Minimum clean air vehicle spaces for nonresidential new construction or alterations that add 10 or more spaces (p.34 in [2016 CALGreen code](#)).



| TOTAL NUMBER OF ACTUAL PARKING SPACES | NUMBER OF REQUIRED EV CHARGING SPACES |
|--|--|
| 0-9 | 0 |
| 10-25 | 1 |
| 26-50 | 2 |
| 51-75 | 4 |
| 76-100 | 5 |
| 101-150 | 7 |
| 151-200 | 10 |
| 201 and over | 6 percent of total ¹ |

Figure 39. EV charging space calculation from 2016 CALGreen code¹³¹

California Building Code requires new single-family homes to install a 208/240-volt branch circuit in attached private garages to facilitate the future installation of a Level 2 EV charger. California Building Code also requires new MUDs with at least 17 units to designate at least 5 percent of their parking spaces (with a minimum of one space) for EVs, of which one space must be in a common area. Physical EVSE do not need to be installed during new construction of MUDs, but the EV spaces must allow for future EVSE installation. Additionally, existing MUDs cannot prohibit a tenant from installing an EV charger; however, the tenant is responsible for the installation costs. Local municipalities in Tulare County can not only adopt these codes as part of their new construction standards for new or refurbished parking lots, but also strive to meet these requirements as they consider installation of EV chargers, or approval of EV chargers in existing parking lots.

Other General Strategies and Best Practices

Given that there are significant EV education, awareness and economic barriers within the region, the multiple best practices identified should be implemented in tandem so efforts can be complementary when possible. Municipal governments can easily dedicate a page on their website with a collection of online EV resources directing people to EV utility programs, federal, state and local incentives, and general PEV information, including but not limited to the sources identified in this report.

During Willdan's outreach we learned that there is a misconception that PEVs cost more than a comparable gasoline vehicle. While the upfront cost of PEVs is typically higher, they can have a lower total cost of ownership when factoring in the cost of electricity, and lower maintenance costs. Cost of ownership calculators like the ones from the [Department of Energy](#), [Alternative Fuels Data Center](#), and [SCE](#) should be included in municipal websites so residents can better understand the financial benefits of EV ownership.

Government agencies can electrify their fleets to increase the visibility to the viability of PEVs in DACs. Similarly, electrifying transit and school buses can bring visibility of PEVs in DACs because they are more likely to use those services. They also gain the additional benefit of reduced local air pollution when their routes are electrified.

Talking with stakeholders also revealed that there is a general concern with municipalities within Tulare County to budget for the significant increase in summer bills due to higher on-peak energy rates with the additional load of EV charging. To manage this spike, municipalities can consider the following options:

- For Public Charging, set up time-dependent charging rate, which mirrors electricity costs charged by the utilities. When electricity costs more, EV drivers pay more. Not only does this cover additional costs

¹³¹ Minimum EV charging spaces for nonresidential new construction (p.35 in [2016 CALGreen code](#)).



incurred by municipalities, but it also encourages the general public to ease additional load on the grid and consider on-peak charging only if necessary.

- For municipalities charging fleets of their own vehicles, they can install smart charging software to manage charging of EVs in real time, based on telematics data from the vehicles themselves.
- Municipalities can also consider the installation of solar PV and stationary battery storage to reduce or eliminate grid-facing load during peak times. A more detailed study would be necessary to investigate the interplay between fleet charging needs, solar PV, batteries and smart charging software, but many transit agencies around the state are currently exploring this option as they are required to convert transit buses to zero emissions vehicles.
- Bill payment plans exist currently within utilities in which qualifying customers can levelized their bill over the entire year, paying more than their actual bill in the winter, and less than their actual bill in the expensive summer months. It is not know whether these plans exist now for EV charging, but it is worth engaging with local utility representatives to discuss this concept further.

Finally, Naseo and Cadmus have developed a [EV Policy Evaluation Rubric](#) Tulare County can use to evaluate different EV policy proposals they may be considering.

Siting Selection and Analysis

Industry best practices for siting EV charging stations relate mainly to:

- Placing EV chargers at sites where electric vehicle drivers park their cars for extended periods of time
- How to locate the optimal placement of an EV charger at a specific site:
 - With reasonable access to the power from the electrical grid (electric tie-in/transformer)
 - Where the charging cables do not create any hazards or impediments to traffic
 - Where parking stalls can be reconfigured to meet necessary ADA compliance requirements
 - Where appropriate safety and security measures can be implemented to maximize user safety and minimize chances of vandalism
- Managed/Smart EV chargers also require access to the internet so they need to be located in areas with cellular, wifi or internet access. With the prevalence of cellular modems, even more remote areas in Tulare County should be able to obtain the connectivity needed for a networked EV charger, even if a high-speed hard-wired connection is not readily available.

As part of this process, the Willdan team has compiled industry best practices into a Siting Guidelines document and has customized them to apply to the Tulare County stakeholders (Table 50).

Table 41 – Site Selection Guidelines¹³²

| Description | Question | Explanations |
|-------------|---|---|
| | Does the site have a dedicated circuit? | Installation of dedicated branch circuits may reduce safety risk and assist with peak load management in scenarios with multiple charging stations. Dedicated circuits should have conduits apart from conduit running from the panel to the EVSE's location. |

¹³² Siting and Design Guidelines for Electric Vehicle Supply Equipment:

<https://www.transportationandclimate.org/siting-and-design-guidelines-electric-vehicle-supply-equipment>



| | | |
|-----------------------------|--|---|
| Connection to Power | Length of the cable to be installed? | Costs rise with increase in cable length (experienced installers recommend not exceeding 25 feet of conduit from panel to EVSE site). |
| | Access to power? | Level – 1 = 120V; Level - 2 = 208-240V and at least 15 to 30 amps. |
| | Age of the existing electrical panel? | (before 1960 will not able to handle large and continuous loads). |
| Networks and Communications | Does the EVSE have advanced metering system? | Advanced metering systems link to a network and tracks usage, bills to the customer, and manage electrical loads. Some EVSE connect to telecommunication networks using wi-fi, Ethernet. (Important for user messaging) |
| Existing Infrastructure | How much existing infrastructure is present? | Construction costs are the driver for added expenses for EVSE, and the cost differential depends on the work required. Existing elements such as landscaping, walkways, curb cuts and other structural elements should be considered for an EVSE. These elements add costs for removal or relocation, in addition to acting as barriers to accessible charging. When possible, consider trenching through soft landscaping (aka softscape). |

Table 42 – Site Design Elements¹³³

| Installation | Access | Operation |
|--|--|--|
| <i>These elements are considered for initial planning and design. They contribute to costs and determine what type of EVSE to install.</i> | <i>These elements relate to the user experience.</i> | <i>These elements of site design relate to day-to-day use of the EVSE as well as long-term goals of hosts and operators.</i> |
| Charge Level | Network Connection | Host-Operator Agreements |
| Proximity to Power | Accessibility | Visibility |
| Mounting Approach | Proximity to Traffic | Location in Lot |
| Number of Cord Sets | Proximity to Building Entrance | Metering |
| Parking Space Dimensions | Proximity to ramp | Length of Stay |
| Environmental Conditions | Lighting | Future Proofing |
| Technology | Signage and Wayfinding | |
| Hazards | Pedestrian Traffic | |

Table 43 – Factors Affecting EVSE Installation¹³⁴

¹³³ Siting and Design Guidelines for Electric Vehicle Supply Equipment:
<https://www.transportationandclimate.org/siting-and-design-guidelines-electric-vehicle-supply-equipment>

¹³⁴ Siting and Design Guidelines for Electric Vehicle Supply Equipment:
<https://www.transportationandclimate.org/siting-and-design-guidelines-electric-vehicle-supply-equipment>



| Category | Factor | Question to be Answered |
|----------------------|-----------------|--|
| Market Analysis | Target Markets | What are the host's motivations and goals for EVSE installation? |
| | Demand | How does anticipated use determine the scope of work for charging stations and EVSE-ready sites? |
| | Host Location | Does the retail, commercial or residential location affect the rate of use? |
| Economic Feasibility | EVSE Cost | Will grant or future program funding be available? |
| | Construction | Is trenching or heavy work required? |
| | Service Upgrade | What is the cost of a service upgrade? How does this impact location? |
| | Revenue | What business model is the best for recuperating the host's or network's capital outlay? |
| | Fiscal Impacts | What costs and benefits are associated with public or government-installed EVSE? |
| Legal | Regulations | What codes and ordinances apply to the site, construction and electrical installation? |
| | Land Use | Are there any local barriers to where EVSE can be installed? |
| | Liability | What entity takes responsibility for any necessary insurance or liability measures? |
| | Terms | What agreements and contracts are necessary or advisable to install and operate EVSE? |
| Operations | Management | What entity will operate and maintain the EVSE? |
| | Utility | What upgrades to service, conduit installation, and metering are needed? |
| | Equipment | Will installation require equipment or technology upgrades beyond the charging station itself? |
| | Scenarios | What alternative installation scenarios could reduce cost or increase revenue? |





Funding Rebate and Incentive Options for EVs and EVSEs

The funding tables below summarize available funding options for EVs (Table 44) and EVSEs (Table 45). The program names contain links to their respective websites and each program is organized by funding type; sponsor; funding limits; timing; whether they are stackable; and with relevant notes.

Table 44 – Summary of Funding, Rebate and Incentive Options for EVs

| Program | Funding Type | Sponsor | Funding Limits | Timing | Stackable with other sources | Notes |
|---|--|-------------------------|-----------------|------------------------|--|--|
| Federal Tax Credits | Tax Credit | Federal Government, IRS | \$1,875-\$7,500 | Rolling | No known conflicts | Tax credit varies depending on make, model, and technology. Credit decreases as manufacturers meet sales thresholds. Credit capped at a filer's annual tax liability. |
| CA Clean Vehicle Rebate | Rebate | CARB, CSE | \$3,500-\$7,000 | First Come first serve | Not stackable with Clean Vehicle Assistance Program if grant chosen. No known conflicts with other funding sources | Only low-income households up to 400% of federal poverty level are eligible. Other applicants placed on a waitlist until more funding is issued to the program. |
| CA Clean Vehicle Assistance Program | Grant or financing at sale of vehicle | CARB | \$2,500-\$5,000 | First Come first serve | A Clean Vehicle Assistance Program grant cannot be stacked with funds from the Clean Vehicle Rebate Project, Rebate Now, Tune in Tune Up, and Replace Your Ride. | Recently received additional funding, will be accepting applicants soon. Only households with an annual income up to 400% of federal poverty level are eligible. Includes free charging unit and up to \$2,000 towards installation. Awarded applicants receive an approval packet that they take to a qualified dealership and receive the discount at the point of sale. Program allows applicants to receive financing at a max of 8% in lieu of a grant. |
| Valley CAN Vehicle Replacement | Incentive in the form of down payment check for new vehicle purchase | Valley Clean Air Now | \$2,500-\$9,500 | Rolling | Stackable with Utility Fuel Reward programs, federal tax credits, and Clean Vehicle Rebate Project. Not stackable with Drive Clean in the San Joaquin Rebate. | Only households with an annual income up to 400% of federal poverty level are eligible. Vehicle must be MY 1999 or older, owner must have had vehicle for at least 6 months and vehicle must have failed a smog test within the last 6 months to qualify. Incentive varies depending on vehicle technology and income level. New vehicle must be purchased from authorized dealers. Only one car replacement per household per lifetime. |
| SCE Clean Fuel Reward Program | Rebate | SCE | 1000 | First Come first serve | No known conflicts | Vehicle must have a current registration at an active SCE residential address. A vehicle can only claim this incentive a maximum of 3 times, determined by its VIN. |



| | | | | | | |
|--|--------|---|-----------------|------------------------|--|--|
| PG&E Clean Fuel Reward Program | Rebate | PG&E | 800 | First Come first serve | No known conflicts | Vehicle must have a current registration at an active PG&E residential address. A vehicle can only claim this incentive 1 time, determined by its VIN. |
| Drive Clean | Rebate | San Joaquin Valley Air Pollution Control District | \$2,000-\$3,000 | First Come first serve | Not stackable with Valley CAN Vehicle Replacement. No known conflicts with other funding sources | Applies to residents and businesses that reside the San Joaquin Valley. |

Table 45 - Summary of Funding, Rebate and Incentive Options for EVSEs

| Program | Funding Type | Sponsor | Funding Limits | Total Available Funding | Timing | Competitive /Formula | Stackable with other sources | Notes |
|--|--------------------------|---------|--|-------------------------|------------------------|----------------------|--|--|
| California Capital Access Program (CalCAP) | Loans, rebates | CEC | \$500,000 per application | ~\$2M | Rolling | Competitive | No known conflicts | Used for the design, development, purchase, and installation of electric vehicle charging stations at small business and MUDs locations in California. Funded through CEC. CalCAP puts 20% of loan principal into a loan-loss reserve fund, 30% if DACs or MUDs. Lender issues full loan and has flexibility on setting its own terms, rates, and conditions. If loan is paid within 48 months, the borrower gets half of the CalEVP contribution as a rebate. |
| Charge Up! | Incentive /reimbursement | SJVAPCD | Level 2 Single Port \$5,000; Level 2 dual port \$6,000; DC Fast Charger \$25,000 with 30% cost share, \$50,000 application cap | Unclear | first come first serve | Competitive | Not stackable with other SJVAPCD funding sources, stackable with outside funding sources | This Program provides funding for public agencies, businesses, and property owners of multi-unit dwellings (i.e. apartment complexes, condominiums, etc.) in the San Joaquin Valley to install electric vehicle (EV) chargers. Single family homes are not eligible. Applicant must get approved voucher before purchasing EVSE |



| | | | | | | | | |
|----------------------------------|-------------------|---|---|---|--|-------------|------------------------------------|---|
| SCE Charge Ready | Incentive, rebate | SCE | Covers all infrastructure and capacity upgrades to support charging stations. DACs can receive a rebate for 100% of base costs (purchase and installation) of approved charging stations. | TBD, SCE requesting \$22M in bridge funding | | Competitive | No known conflicts | Program currently limited to MUDs, expected to expand when additional funding is issued. Applications must have a minimum of 5 charging stations in DACs, 10 Charging stations minimum in other sites. Half of installed charging ports targeted in DACs. |
| PACE | Financing | California Alternative Energy and Advanced Transportation Financing Authority | Varies per lending agency | | | Competitive | No known conflicts | Available for residential property owners, 3 or fewer units. EVSE can be installed with no money down and repaid through property taxes. CAEATFA puts funds into a loan loss reserve fund for mortgage lenders. |
| VW Mitigation | TBD | CARB/VW | TBD | \$10 million | Funding expected to be available Fall 2019 | Competitive | TBD when funding details announced | 50% of total VW funding is expected to benefit DACs |
| CMAQ | Incentive | FHWA/TCAG | N/A | \$6.1 million per year | Rolling | Competitive | No known conflicts | Federal funding allocated to TCAG for reducing congestion and improving air quality. Funding priority is based on cost effectiveness of improving local air quality. |



Conclusion

Currently, there is a significant amount of money, time and effort being invested to push towards zero emissions transportation in California. However, a majority of existing efforts to date have been concentrated in more urban areas of the state, leaving some more rural and disadvantaged communities with a significant amount of work to do to support the widespread adoption of electric vehicles.

The good news is that by using the work of those who have gone before them, Cities within and the County of Tulare itself can embrace policies which promote the adoption of EVs and make charging convenient and economical for its citizens. By focusing on educating the public on the availability and benefits of EVs, especially the economic incentives available and long term financial benefits of EV ownership, as well as a specific support for EV adoption in DACs and at MUDs, municipalities in Tulare County can support efforts to drive higher awareness and demand for EV purchases and use. Through publishing clear EVSE station sighting guidelines, parking and signage requirements, EV-specific building codes, zoning policies and permitting, local jurisdictions within Tulare County can streamline the approval process for future EVSE installations and support their successful use. Finally, by supporting EVSE specific vocational training, already established Utility workplace charging efforts and fleet electrification efforts, Tulare County can become an active participant in managing the expansion of EV charging in their County to minimize impacts to the electrical grid and maximize usefulness to its citizens. Using the best practices and case studies in this report as a starting point, Tulare County can catch and/or surpass other areas in the state and nation with regard to electric vehicle adoption, contributing to significantly cleaner air for its citizens and a brighter future for generations to come.



APPENDICES

APPENDIX A – List of City Contacts in Tulare County¹³⁵

| Location | Site POC | Title |
|---------------------|----------------------|--|
| Tulare County | | |
| * | Aaron Bock | Assistant Director of Planning |
| | Reed Schenke | RMA Director |
| | John Hess | General Services Agency Director |
| * | Brooke Sisk | Assistant GSA Director |
| | Katrina Fernandez | Supervising Staff Services Analyst |
| | Christopher Martinez | Staff Services Analyst |
| | Mila Orth | Department Secretary |
| City of Visalia | | |
| * | Paul Bernal | City Planner |
| | Mario Cifuentez | Director of GSA |
| | Leslie Blaire | Cities Traffic Engineer |
| | Randy Groom | City Manager |
| City of Tulare | | |
| | Steven Sopp | Planning Department |
| | Josh McDonnell | Community & Econ Director |
| | Rob Hunt | Interim City Manager |
| * | Mike Miller | City Engineer |
| | Steve Bonville | General Services Director - Fleet/Transit |
| City of Porterville | | |
| | Julie Phillips | Community Development Manager |
| | John Lollis | City Manager |
| * | Mike Reed | Public Works Director |
| * | Richard Tree | Transit Manager |
| | Eric Mittlestead | Vice Chancellor, Construction & Facilities |
| City of Dinuba | | |
| | Daniel James | Interim Asst. City Manager |
| * | Ismael Hernandez | Public Works Director |
| | Luis Patlan | City Manager |
| City of Lindsay | | |
| | Brian Spaunhurst | City Planner |

¹³⁵ * Indicates lead contacts



| | | |
|----------------------|-----------------------|---|
| | Bill Zigler | City Manager |
| | Michael Camarena | City Services Director |
| City of Exeter | | |
| * | Daymon Qualls | Public Works Director |
| | Adam Ennis | City Manager |
| | Marie Arroyo | Administrative Assistant |
| City of Woodlake | | |
| * | Jason Waters | Community Services Director |
| | Ramon Lara | City Manager |
| City of Farmersville | | |
| * | Jennifer Gomez | City Manager |
| Self Help Enterprise | | |
| | Paul Boyer | Program Director, Community Development |
| | Betsy McGovern-Garcia | Program Director, Real Estate Development |
| | Abigail Solis | Senior Community Development Specialist |
| * | Andrea Barnier | Senior Asset Management Specialist |
| | Patrick Isherwood | Director of Asset Management |

List of Contacts for Case Study Sites:

| Name of the City | Place | Places Around | Address | Contact Name | Contact Title |
|------------------|----------------|---|--|---------------|--------------------------------|
| Dinuba | Parking Lot | California Tacos, Dinuba Pharmacy, Retail Stores, Platinum Theatres | W Fresno St, between N M St. and N L St. | Daniel James | Interim Assistant City Manager |
| Exeter | Shopping Plaza | Extreme Shooting Sports, Subway, Save Mart, McDonald's, Taco Bell, Bank of the Sierra, AutoZone | 1121 W Visalia Rd, Exeter, CA 93221 | Daymon Qualls | Public Works Director |
| Exeter | Citrus Plaza | Rite Aid, Fortune Cookies, Me n ed's Pizza, Bank of Sierra, | W Visalia Rd and N Belmont Rd | Daymon Qualls | Public Works Director |



| | | | | | |
|------------------|-----------------------------------|---|--|------------------|-------------------------------------|
| Farmersville | Rest Stop | Taco Bell, Save Mart McD, Subway and Taco Bell | 452 Avenue 295, Farmersville, CA 93223 | Tim Boone | COO |
| Lindsay | Olivewood Plaza | Little Caesar's, Starbucks just outside. Various other shops around | 210 CA-65, Lindsay, CA 93247 | Michael Camarena | Director of City Services |
| Lindsay | Lindsay Branch Library | Community Theatre | 157 N Mirage Ave, Lindsay, CA 93247 | Michael Camarena | Director of City Services |
| Porterville | Target | Starbucks, Marshalls, Dollar Tree, Wingstop, McDonalds, Kohl's | 1363 W Henderson Ave, Porterville, CA 93257 | Dallas | Property Manager |
| Porterville | Downtown Parking Lot | Bank Of Sierra, Downtown Porterville | E of 2nd Street, between E Garden Ave & Olive Ave | Mike Reed | Public Works |
| Tulare | Public Library | Library, Transit Center, Plaza just across the street | 475 N M St, Tulare, CA 93274 N L Street and Tulare Sante Fe Trail. Parking on the N L street | Steven Bonville | General Services Director |
| Visalia | Goshen Village II | Apartment Complexes | 30940 Road 72, Goshen, CA | Andrea Barnier | Senior Asset Management Specialist |
| Visalia | Visalia Mall | Department stores, Food courts, Retail shops | 2031 S Mooney Blvd, Visalia, CA 93277 | Rick Feder | General Manager |
| Visalia (County) | Tulare County Superior Courthouse | Tulare County Public Defender, Traffic Court; Public Law Library | 221 S Mooney Blvd, Visalia, CA 93291 | Brooke Sisk | Assistant General Services Director |
| Woodlake | Community Center | Downtown Woodlake, Dispensary | 145 N Magnolia Street | Jason Waters | Community Services Director |



APPENDIX B – EV Readiness Checklist Q&A Summary

<<Still being cleaned up for report>>

APPENDIX C – Cost Analysis Assumptions

1. The total unit cost is inclusive of both hardware and software costs. The unit costs are affected by the charging level, number of ports, communication system, data analysis, and other additional features like access controls which have [radio-frequency identification](#) (RFID) cards or mobile phone applications. The cost analysis for this report evaluates a level 2 charger, ChargePoint CT4021 – GW1 Gateway Unit (for low and medium costs), and ChargePoint CT4025 – GW1 Gateway Unit (for high costs). The level 3 charger being evaluated is the ChargePoint Express 250 (low, medium and high). The unit cost includes the cost of the dual ports, the costs of the cable length, the communication system and the cost of mounting. Level 3 chargers are recommended at the Community Center in Woodlake, the Visalia Mall (Visalia) and a Rest Stop in Farmersville.
2. [Installation costs](#) are driven by factors like trenching, materials, labor, electrical upgrades, traffic protection etc.
For the analysis, the installation costs include: -
 - a. The cost for conduit and wiring which is assumed to be an average value of \$2/ft.
 - b. The cost of trenching is assumed to be an average value of \$125/ft for asphalt or concrete and \$15/foot for soil. The number of hours for trenching is assumed to be the same as the number of hours spent for conduit and wiring.
 - c. The electrician labor cost and the labor costs for mounting and signage which is assumed as \$75/hour.
 - d. The costs for engineering review and drawings is assumed to be in the range of \$1000 - \$3000.
 - e. The substation upgrade cost for Level 3 chargers is assumed to be in between \$10,000 - \$25,000.
 - f. The permitting (plan check) cost is assumed as \$131/hour and the assumed inspection cost is \$157/hour for Visalia. The remaining cities have been assumed at \$120/hour for permitting (plan check) and \$150/hour for inspection.

The costs are also driven by the age of the panel, traffic protection, etc. (not included in the costs as they can vary with location).

3. [Operation and Maintenance Costs](#) will include costs related to maintenance and repair, labor and materials, network fees (internet costs) and electricity.
For this analysis, the maintenance costs include: -
 - a. The labor and materials cost is assumed in the range of \$50 - \$120.
 - b. The charging network fees cost which ranges between \$100 - \$900 annually.
4. Incentives for this analysis include the [Electric Vehicle Supply Equipment \(EVSE\) Incentives for the San Joaquin Valley](#) which states that a Level 2, dual port charger may receive up to \$6,000 per unit and a Level 3 charger may receive up to \$25,000 per unit.

