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Conveniently Located Fast Charging for High Density Apartment Complexes:

A Look at Fresno

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Purpose

- Assess various options to provide electric vehicle charging to multi-unit dwellings.
- Determine what types of chargers and the placement of the chargers that would provide the most benefit to the targeted EV purchaser.
- Conduct the assessment on a very localized level.

Case Study: California Plug-In Electric Vehicle Collaborative (Summary)

Complex	Rent/ Purchase	Other	# Units	# Parking Sp.	# Res PEV Drivers	PEV charger provided	Cost to PEV owner	Charger type	Notes/ Challenges
200 Brannan – 1 Federal San Francisco	\$3,495 - 1/1 \$5,900 - 2/2	\$619 HOA fee per mo.	241	335 (all deeded) 0 guest parking	6	EverCharge	\$1,000 to \$2,800 for wiring runs, \$1,000 for unit, \$15/mo + usage fee \$/kWhr	Level 2 - 6	2 Bldgs – 10 Story and 3 Story Lower level parking Built in 2004
Broadstone Corsair San Diego	\$2,040 – 2,160 1/1 \$2,667 – 3352 2/2	No HOA	360	713 (assigned) 2 visitor spaces	5	ChargePoint	\$0.25 per kilowatt-hour	Level 2 - 32	Parking garage and permit parking Built 2013
Madera Apartments Mountain View	\$3,791 – 4,316 1/1 \$5,253 – 5,735 2/2	No HOA	203	300	5	ChargePoint provides three level 2 chargers. All res have level 1.	ChargePoint charges \$0.50 per Kwh for level 2. Level 1 charging subject to peak and off-peak prices.	Level 1 – 300 Level 2 - 3	Underground parking Built 2013

Source: PEV Collaborative



Case Study Issues

Case Study

- Parking was exclusive to building/complex. No extensive wiring runs needed
- High rents/purchase price of units indicates higher than average income
- EV Drivers have resources to purchase private chargers
- Chargers that were available for guests would most likely be in use by existing EV residents and prone to non-use parking
- Small EV population in proportion to total drivers
- Charging is an amenity



Ideal Prospect Questions

- I. What kinds of apartments are for middle income dwellers?
- II. What are the attributes of those types of apartments?



Desirable Qualities

- Rent and location that is in the range of middle class worker
- Public Access
- High density residential areas
- In close proximity to multiple types of drivers and buildings
- Existing market of EV drivers



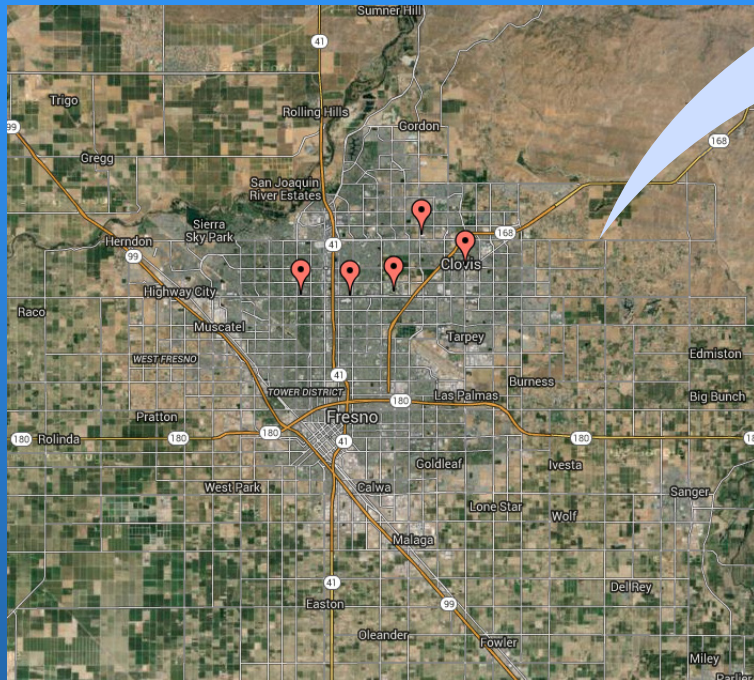
Geographical Attributes



- San Joaquin County
- Centrally located
 - Confluence of highways
 - Dense concentration of MUDs in metropolitan areas

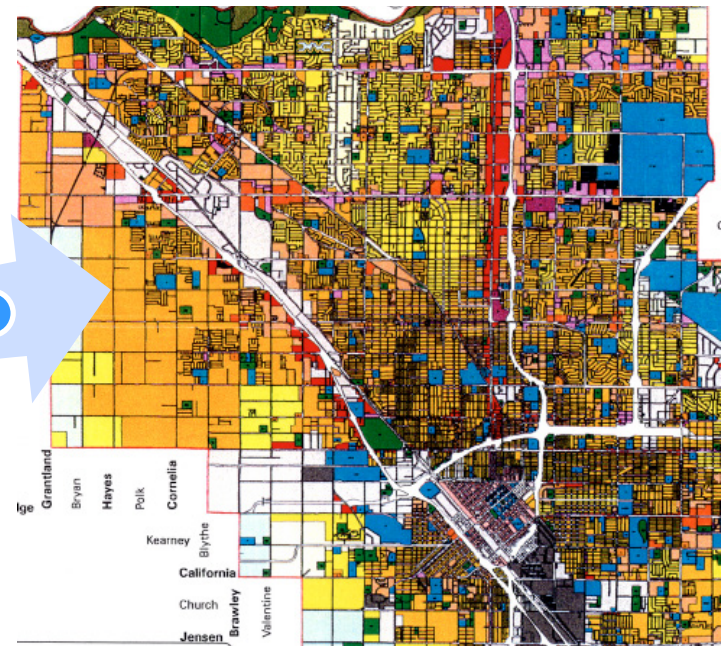


Current DC Charging, Limitations and Potential



Source: Google maps

Med High
Density
Residential
(Orange)

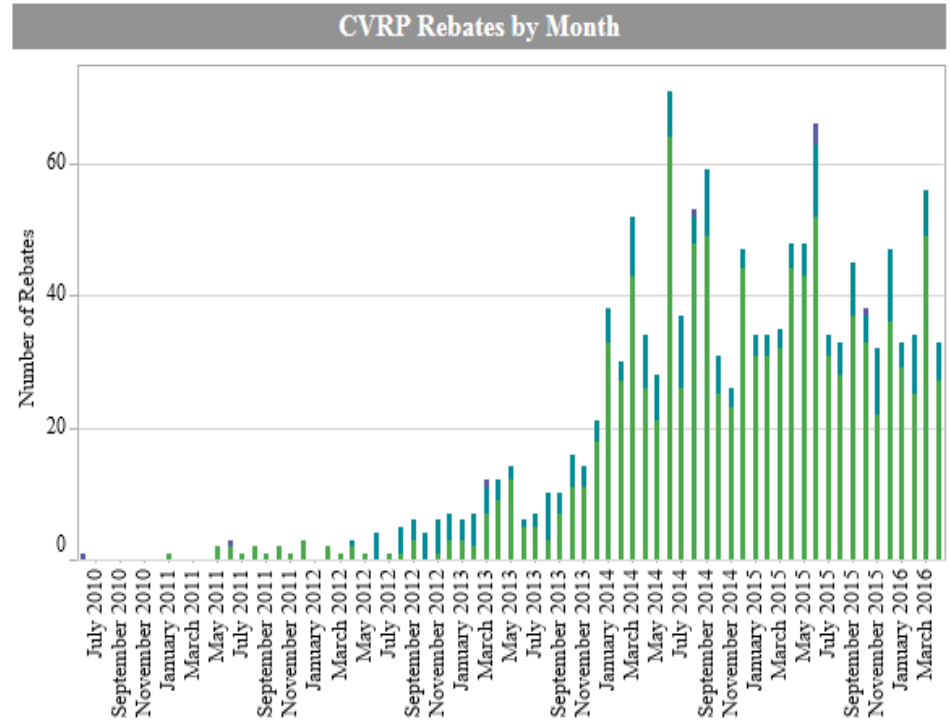


Source: Fresno General Plan

- 4 DC chargers
- Residents have limited resources to home charging
- New DC chargers would be in close proximity to MUDs.

A Prospective City

- Accessibility to a large potential populace of EV buyers
- Accessibility to a diverse pool including commuters and destination drivers
- Chargers will be needed to continue to push growth in the EV market

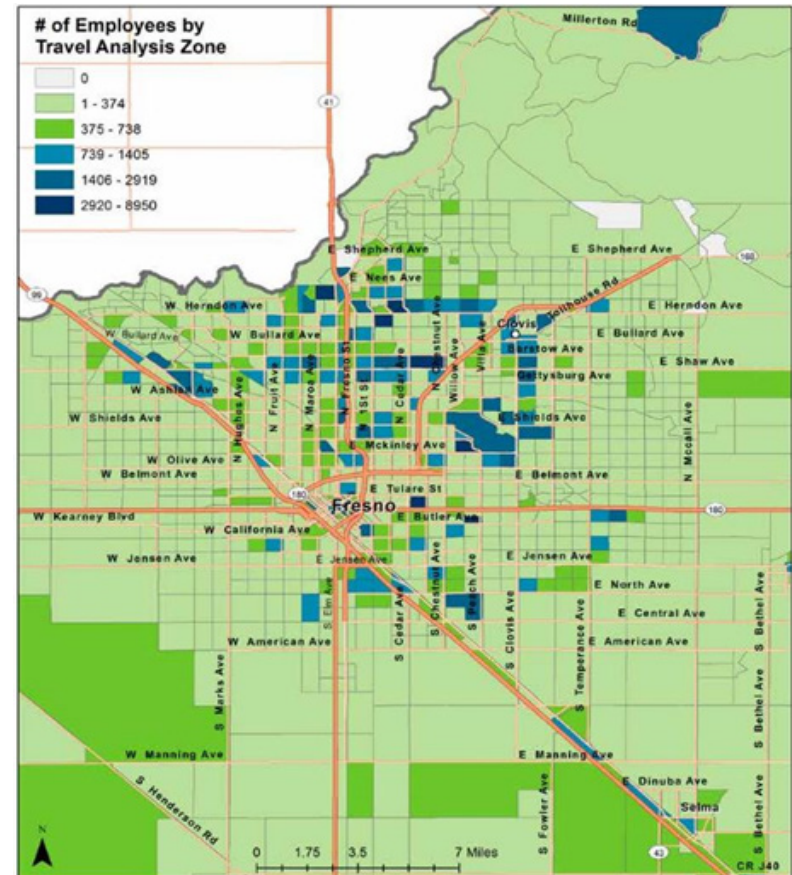


Source: California Vehicle Rebate Program



Continued

- High density of apartments bound by SR-99, SR-41, SR-168 and SR-180
- San Joaquin PEV Readiness Plan cited effective locations for employee charging among high density residential units



Source: San Joaquin PEV Readiness Plan



Looking Forward

- Need to consider commute distances and patterns

Questions

- Is the “gas station” model with 50 kW DCFC a good proxy for apartments with no assigned parking or difficulty in putting in on-site chargers?
- Do we also need to look at strategic level 2 chargers for cars that can’t use DC FC and for opportunity charging for destination drivers?
- Electricity supply sufficient for 50 kW DCFC?
- Impact to site host?



Sources

- Chiladakis, Lisa. "Case Studies with MUDs." *California Plug-In Electric Vehicle Collaboration* (2016): n. page. 1 Feb. 2016. Web. 1 June 2016.
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