Item 7: Enabling Electric Vehicles as Distributed Energy Resources - GFO-24-302

September 10, 2025 Business Meeting

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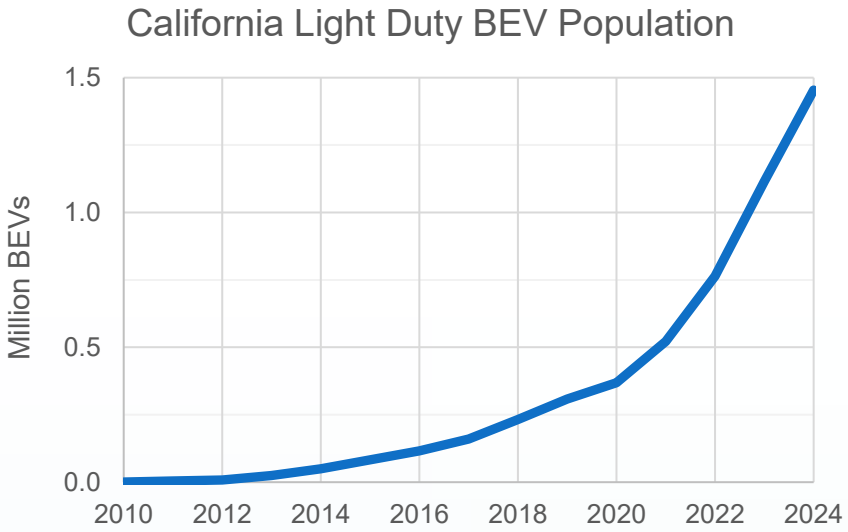
Energy Research and Development Division
Energy Systems and Transportation Branch

Role of Vehicle Grid Integration (VGI)

Fast-growing population of EVs



Source: CEC

VGI

Capacity-constrained grid

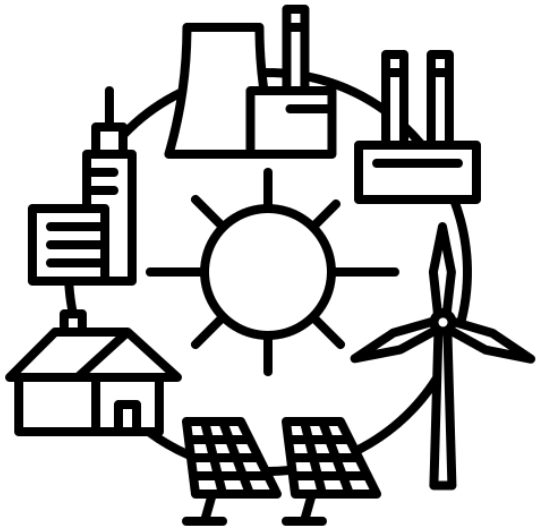
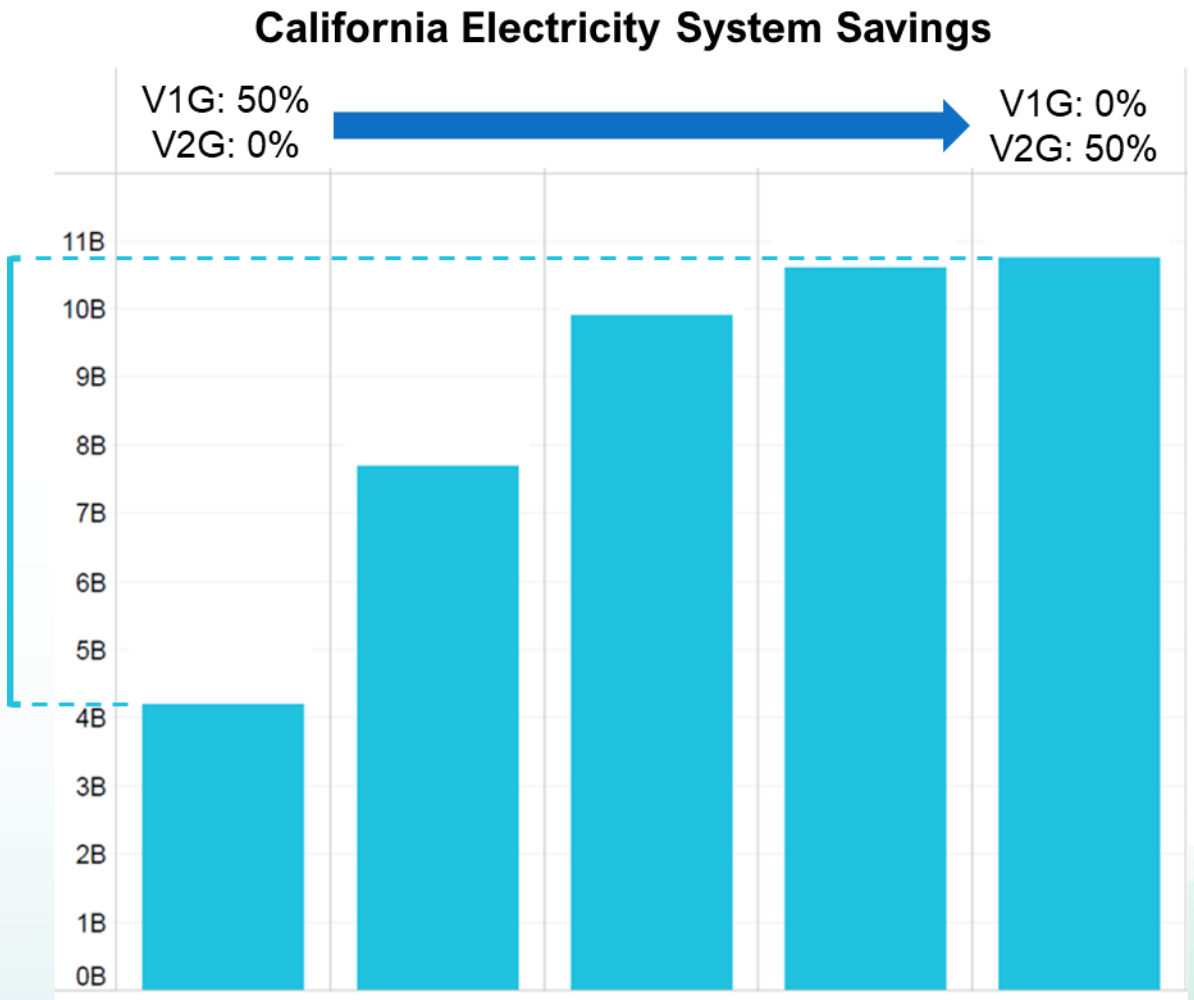


Image from Flaticon.com

VGI: Any method of altering the **time, charging level, or location** at which grid-connected electric vehicles **charge or discharge** in a manner that optimizes interaction with the electric grid and provides net benefits to ratepayers.

Market Potential

$4B - $10B electricity system savings by 2045



Source: Evolved Energy Research

Solicitation Overview

Accelerate the use of EVs as DERs

Group 1
Addressing VGI Knowledge Gaps

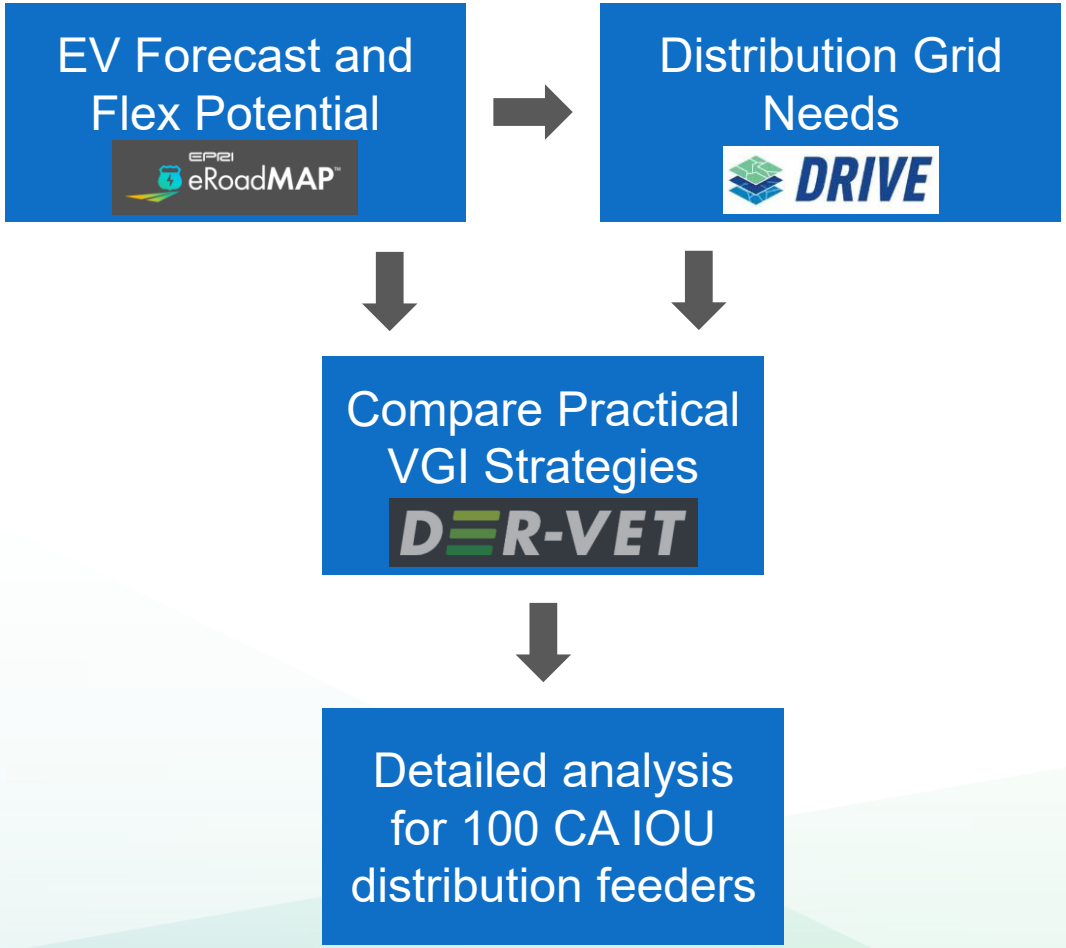
Group 2
Reducing the Cost of V2X Enabling Technology

Group 3
Submetering Solutions to Facilitate VGI

Images from Flaticon.com

7a. EPRI

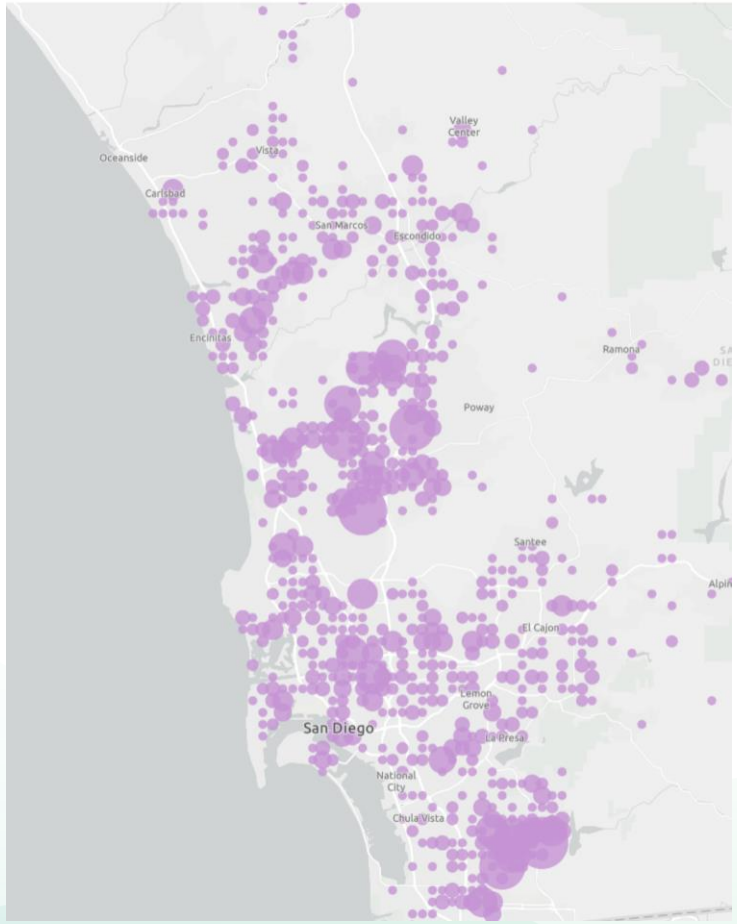
- Evaluate practical VGI strategies:
  - Flexible connections
  - Distribution grid services
  - Time varying pricing
- Methods to infer statewide insights from feeder-level analysis
- Strategies for equitable VGI access



7b. San Diego Community Power

- Analyze data from ongoing V1G pilot with Optiwatt
- Assess V1G for reducing resource procurement costs
- Collaborate with SDG&E to determine distribution grid value
- Inform optimal V1G for unbundled customers

Managed Charging Pilot-Eligible EVs

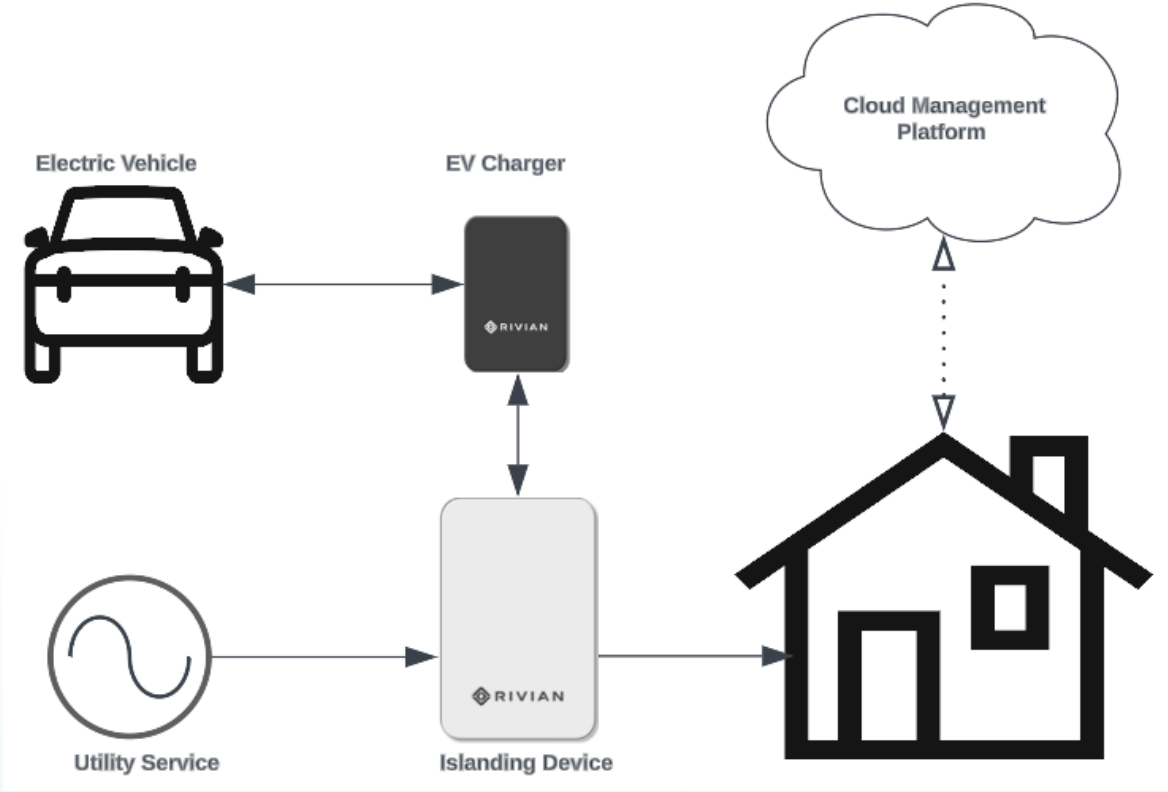


Source: Optiwatt

7c. Rivian Automotive

- Develop an AC bidirectional EVSE and automatic islanding device
- Load shedding capabilities
- Enable V2G, V2H
- Reduce installed cost by 35% - 65%
- Interoperable with non-Rivian EVs

Schematic of Rivian's Residential AC Bidirectional Charging System

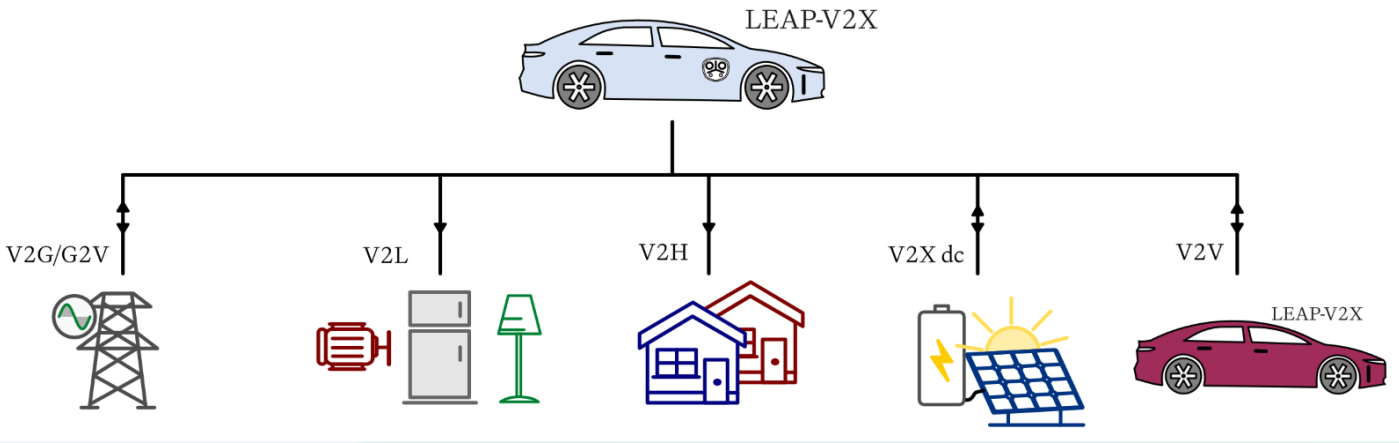


Source: Rivian

7d. Lucid Group, Inc.

- Single-stage bidirectional On-board Charger (OBC)
- 54% cost and 20% size reduction
- Enables V2X through DC or AC pathways
- OBC will enter scaled production
- Will license this technology to other OEMs

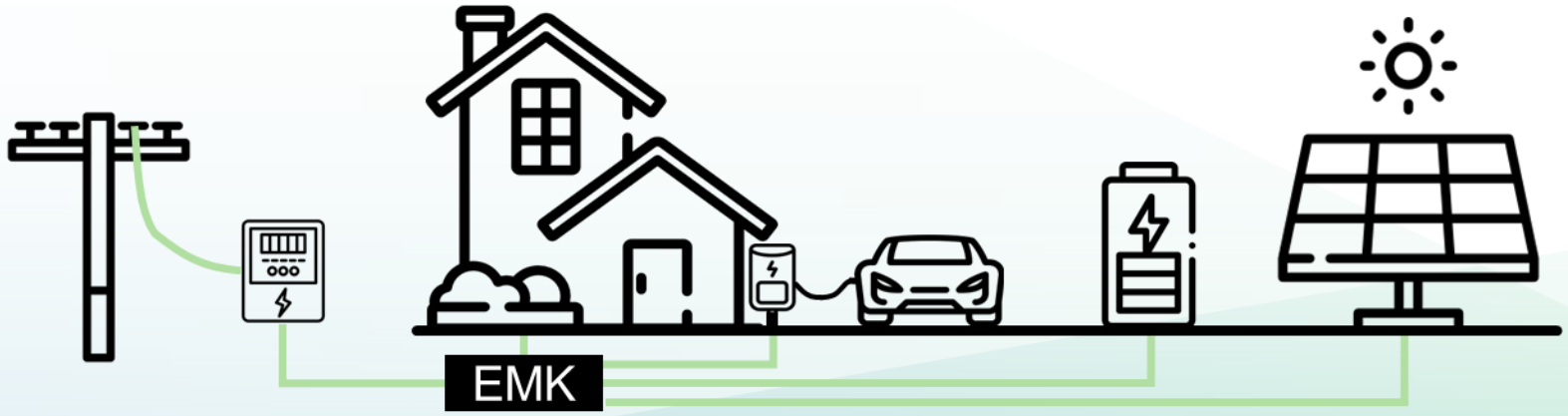
Lucid Bidirectional AC and DC Power-Flow Capabilities



Source: Lucid

7e. Nuvve Holding Corp.

- Vendor agnostic Energy Management Kit (EMK) to enable bidirectional charging
- Integrates with EVSE, solar, storage, and home energy management
- Optimize energy use for cost savings, grid stability, and customer resilience
- Designed to mitigate capacity limitations
- Demonstrate in at least 5 residential sites in California



Images from Flaticon.com

7f. UC Riverside

- Maximize fleet benefits from V2X services
- Minimize battery degradation from V2X
- Demonstrate V2X with medium-duty electric box trucks
- Provide distribution grid services near end of feeder

Source: UC Riverside

7g. It's Electric

- Bring-your-own cable model
- Develop curbside bidirectional EVSE
- Demonstrate at UC Berkeley Richmond Field Station
- Expands V2X benefits to MUDs and densely populated urban areas

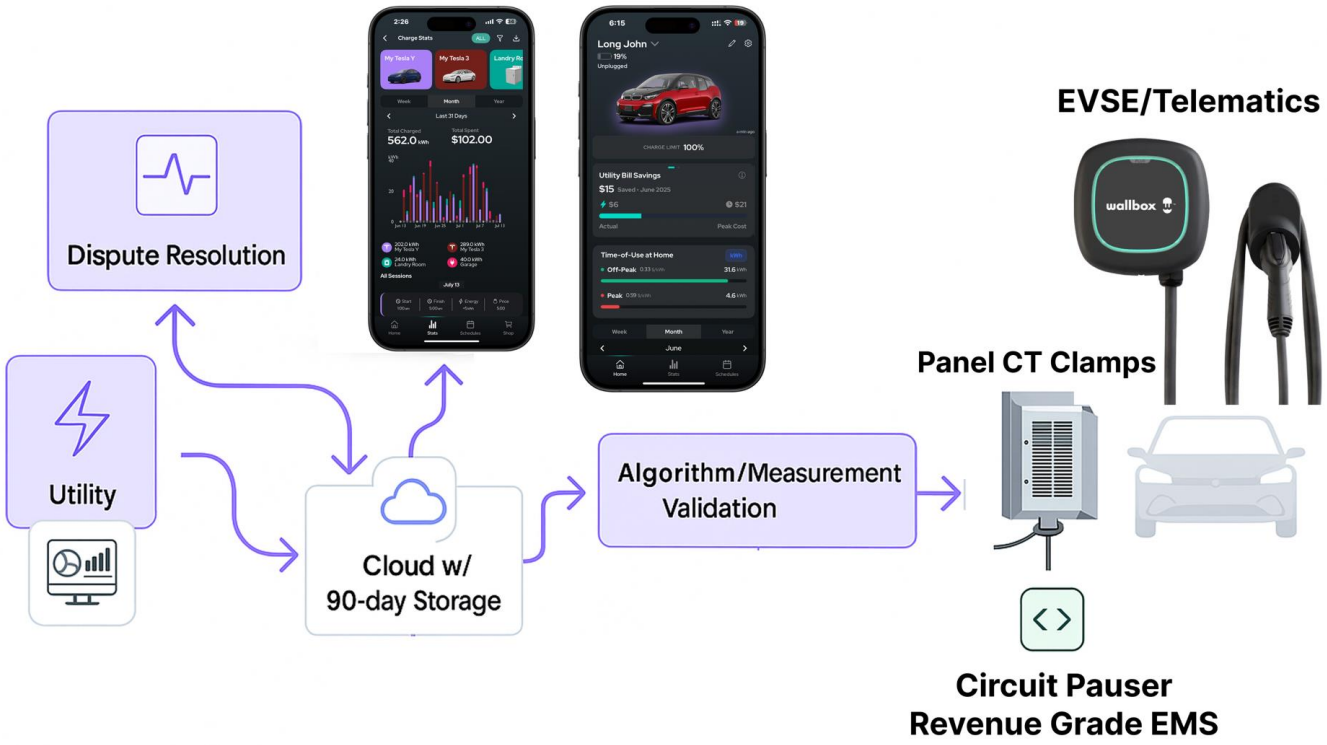
It's Electric Curbside Charging System

Source: It's Electric

7h. NeoCharge Inc.

- Reduce barriers to residential EV submetering
- Add Meter Data Management Agent functionality to App
- Target $500-850 installed cost
- Demonstrate at 75 homes

NeoCharge MDMA Platform and Measurement Framework

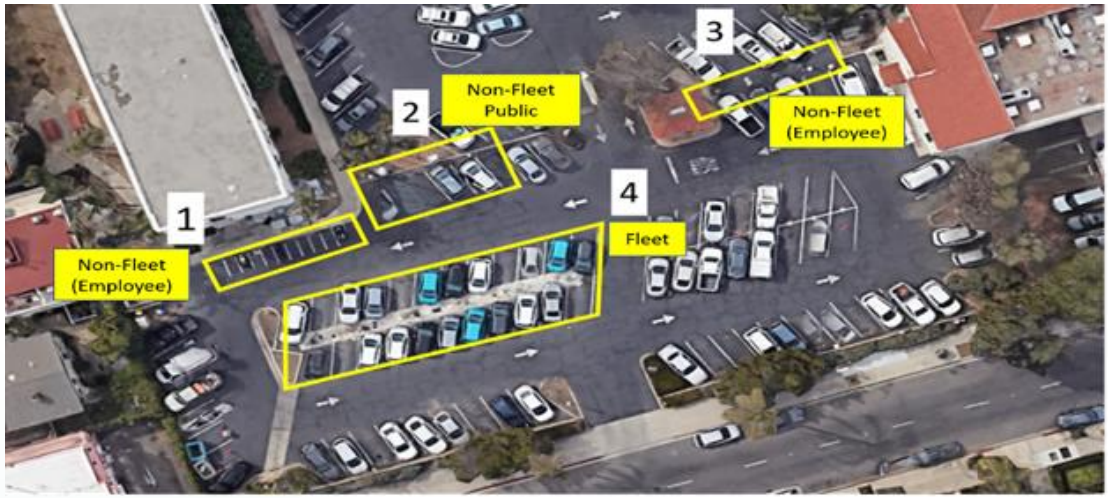


Source: NeoCharge

7i. UC Davis

- Virtual submetering solutions for commercial EV charging
- Test submetering use cases including:
  - EVSE group
  - Circuit level
  - User-based (stretch goal)
- Reduce site host burden for cost allocation

Demonstration Site: Santa Barbara Administrative Parking Lot



Source: UC Davis

Staff Recommendation

- Adopt staff's determination that projects are exempt from CEQA.
- Approve all 9 grant agreements.

Image from Flaticon.com