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Improving Preparedness of Communities for Evacuations using ZEVs

Workshop #3 With Community Partners

Date: October 2nd, 2025

Location: UC Merced, Conference Center, Room 110

Summary: Over the past 2 years, UC Merced, UC Davis, UC Santa Cruz, and UC Berkeley have collaborated to develop decision-support tools aimed at helping communities prepare for evacuations using electric vehicles (EVs) during climate-related disasters. As we reach the conclusion of this project, we invite community partners and stakeholders to join us for a final workshop to review and reflect on the outcomes of our research.

This event will include presentations on the key findings, demonstrations of the latest versions of our tools, and interactive sessions to discuss policy implications and practical applications. The goal of this final meeting is not only to present what we've developed, but also to gather your insights on future directions and potential improvements.

Click on this link to access the zoom meeting:
https://ucmerced.zoom.us/j/82397665212?pwd=uWdt7fvgLUDxbOtRrdbkAbUbnt2EGb.1
-   Meeting ID: 823 9766 5212
-   Passcode: 494139

All supporting documents are provided in this folder:
https://ucmerced.box.com/s/iblkpyxoxf39xq8fah4jc48besbozyqc

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-   Clotilde Robert: +1 (209) 291-4052
-   Joseph Moyalan: +1 (864) 207-1880

Agenda:

Time	Description	Presenter
10:00-10:25am	Coffee	-
10:30-10:40am	Welcome introduction	Ricardo (UCM) + All
10:45–11:05am	Public policy implications for effective EV-based evacuations: Discussing the public policy brief *(Public policy brief available on the Box folder, see the file named "Task5_PublicPolicy")*	Sam (UCM)
11:05–11:25am	How to evaluate your readiness level for evacuation? *(Report available on the Box folder, see the file named "Task1_Report")*	Osman (UCSC), Clotilde (UCM)
11:30–12:20pm	Interactive session – Assessing evacuation readiness: Orientation, group creation, and discussion (Supplementary materials available in the Box folder, under the files named "Interactive Session")	Clotilde (UCM), Osman (UCSC), Ali (UCM)
12:25–12:30pm	Group Photo	–
12:35-1:30pm	Lunch	–
1:35-1:55pm	Modeling a real-world evacuation scenario in Mariposa, CA	Qijian (UCB)
2:00-2:30pm	Optimal vehicle routing, scheduling, and mobile charger dispatch during EV evacuations	Xuchang (UCD), Joseph (UCM), Qijian (UCB)
2:35-2:45pm	How to use LLMs for preliminary evacuation of communities? Opportunities and pitfalls.	Joseph Moyalan (UCM)
2:50-3:10pm	Optimizing Power System Resilience for ZEV-Based Evacuations	Saeed Aliamooei Lakeh (UCSC)
3:15-3:30pm	End-of-Day and Project Conclusion	Ricardo

List of Participants

- **Community partner:**
    1. Noah (from Perimeter)
    2. Wonuola Olagunju (from CCAC)
    3. Joseph Kwong (from EvenRecharge)
    4. Meenakshi Venkatraman (from LBL)
    5. Natalie Reavey (from CARB)
    6. Captain W. Smith (from Mariposa County)
    7. Raquel Sandoval (from Mariposa County)
    8. Sgt. Rumfelt (from Mariposa County)
    9. Adam Amaral (from Merced OES)
    10. J. Hicks (from TID)

- **Researchers:**
    1. Ricardo deCastro (UCM)
    2. Clotilde Robert (UCM)
    3. Joseph Moyalan (UCM)
    4. Dilawer Ali (UCM)
    5. Qijian Gan (UC Berkeley)
    6. Gavin Wang (UC Santa Cruz)
    7. Xuchang Tang (UC Davis)
    8. Osman Saleem (UC Santa Cruz)
    9. Keith Corzine (UC Santa Cruz)
    10. Saeed Lakeh (UC Santa Cruz)
    11. Sam Markolf (UC Merced)
    12. Xinfan Lin (UC Davis)

Workshop Summary

1. **General Feedback from Community Partners (During Presentations)**

(Source: Note from Ricardo)

Community partners from Mariposa and Merced Counties OES provided constructive, policy-oriented feedback:

- **Building codes & private sector role:** Local and state codes should require EV-charger installation, especially for short-term rentals or vacation homes (e.g., Airbnb). Private companies could help enforce these requirements.
- **Routing tools vs Google Maps:** Participants asked how the project's routing model differs from Google Maps. They noted that Google often sends all drivers along the same route, creating congestion.
- **Road conditions:** Mariposa County asked if the model includes dirt roads or side roads. Answer: roads are pre-filtered to avoid unsafe paths.
- **Information to the public:** Question on how "best routes" are communicated. Answer: integration with existing apps (e.g., Google Maps or Perimeter) is planned.
- **Energy distribution planning:** Merced County observed that California has a fuel distribution plan for emergencies but no equivalent for EV energy. Partners suggested developing a state-level EV energy distribution plan to manage evacuation and post-event recovery.
- **Emergency declarations:** Suggestion to include explicit provisions for EV charger access in state emergency declarations, giving local authorities more flexibility.
- **Regulation and funding:** State laws already require hazard analysis and evacuation plans. Partners asked if the state should require counties to revisit these plans to include ZEV constraints, and who would fund such revisions.

2. **Readiness Indicators – Format and Structure**

(Sources: Note from Ricardo + Gavin's Notes + Keith's Notes + Clotilde's Notes)

Consensus: the indicator tables should be simpler and easier to understand for local governments and the public. The tool should serve as a **self-assessment guide**, not a compliance test.

- Reduce the number of levels from four to three ("Not Ready – Somewhat Ready – Ready").
- Rename levels to avoid negative wording (e.g., *Bad → Poor or Insufficient*; *Excellent → Very Good*).
- Add color coding (Red, Yellow, Green) for quick visual understanding.
- Use integer values (0, 1, 2...) or a 1–10 scale instead of decimal ranges to make the scoring clearer.

- Adjust the range width: the variation for *Bad* and *Excellent* could be narrower, while the *Good/Medium* range could be wider, since most communities fall in between these two extremes.
- Make sure that each table includes a short, clear description for every level, written in plain English.

3. Community Engagement & Preparedness Feedback

(Detailed synthesis from Gavin + Keith + Note from Ricardo)

➢ **CEP1 – EV User Communication Readiness**
  - No consistent communication strategy for EV owners.
  - Counties mainly use social media (through PIOs, sheriff offices, Everbridge) but lack content specific to ZEV evacuations.
  - Private companies sometimes distribute safety information instead of local agencies.
  - Language barriers remain a major challenge (e.g., Planada evacuation, most residents spoke Spanish).
  - Need for bilingual, simple messages and possibly physical assistance for vulnerable residents.
  - Suggested establishing a minimum legislative standard for communication on EV evacuations.

➢ **CEP2 – Emergency Charging Access & Public-Private Coordination**
  - Price gouging concerns during high demand periods (e.g., like hotel price spikes).
  - Lack of coordination with private utilities and charging operators.
  - Suggest including provisions in executive orders to let local governments mobilize power resources.
  - Need for an EV energy distribution plan, similar to the existing fuel distribution plan.
  - County representatives noted that EV charging stations are often installed without county oversight or permits → urge for better data sharing and coordination.

➢ **CEP3 – Community Planning for ZEV Evacuations**
  - EV considerations should be integrated into existing evacuation plans, not developed separately.
  - These plans must also cover communication, logistics, shelters, utilities, and recovery.
  - Counties need funding to update plans and comply with new requirements.
  - Current laws mandate plans but don't specify EVs; future Senate or Assembly bills should add multilingual and EV-specific provisions.
  - Without an EV database, governments can't target charging investments effectively.

➢ **CEP4 – Emergency Response for EVs Left Behind**
  - Based on Palisades Fire experience: lack of training led to secondary fires during cleanup of burned EVs.

o Need for clear recovery protocols and training for contractors handling damaged EVs.

o Suggest renaming indicator from *Response* to Recovery, as it focuses on post-event management.

o Federal and state support required to document and reimburse cleanup costs.

4. Transportation Feedback

➢ **T1 – EV-Ready Evacuation Routes:** Participants emphasized the need to compare charger distribution with EV population density. Route planning should prioritize areas where charging demand is expected to be higher.

➢ **T3 – First Responder and Roadside Assistance Protocols:** The group discussed the need to clarify what "awareness" means in the scoring tables, specifically, whether it refers to basic knowledge, training, or access to materials. It was also noted that readiness may differ between agencies: for example, firefighters are generally trained for EV fires, but tow truck operators may not be. To simplify evaluation, participants suggested focusing the scoring on towing capabilities only, instead of mixing different responder types within a single assessment.

5. Charging Infrastructure Feedback

➢ Criteria for the different readiness levels could be defined using the ratio of EV population to the number of charging stations. This quantitative approach would help standardize how communities are evaluated.

6. Mobile Charging and Power Backup

➢ **MB3 – Critical Charger Locations and Backup Power:** Participants proposed using V2X-capable vehicles to deploy mobile charging in the identified priority locations, strengthening resilience and flexibility during emergencies.

7. Other Stakeholder Comments and Observations

(Mainly from Gavin's Notes)

- Vacation rentals and Airbnbs should be EV-ready and require permits for charging infrastructure.
- Stakeholders want to control which roads are used for evacuation and avoid unsafe dirt paths.
- Local utilities already face high summer demand and may struggle to supply extra power during evacuations.
- Policy insight (Sam Markolf): Mobile chargers along routes and at origins were ranked as the most effective strategy; departure time management was ranked least effective.