Project Summary

Widespread adoption of Electric Vehicles (EVs) is a promising pathway to reduce carbon pollution from transportation. However, one of the largest barriers to the widespread adoption of EVs is a lack of convenient, affordable, and reliable infrastructure for charging vehicles – especially for disadvantaged communities that lack home charging access. Therefore, the main goal of this project is to develop and analyze charging management strategies that promote equitable access to public charging infrastructure, contributing to increased EV adoption among disadvantaged groups and improved local air quality. In pursuit of this goal, a diverse set of researchers from UC Merced will collaborate with UC Merced Transportation and Parking Services and community partners such as Kern Community College District, CalStart, and the San Joaquin Valley Air Pollution Control District to complete several tasks:

i. development of equity metrics for prioritizing access and use of public charging infrastructure;
ii. investigate frameworks and outcomes for including equity factors in the management of EV charging stations; and
iii. a pilot demonstration on UC Merced campus to experimentally validate the proposed concepts and strategies mentioned above.

At the campus-scale, the actionable outcomes of the project include the installation of five new EV charging stations that would be available for the campus and broader Merced community to use. Additionally, most of the project resources are dedicated to the training of student researchers (many from groups underrepresented in engineering) and the development of the next generation of clean energy researchers and practitioners. Regionally, lessons learned from the project can catalyze the adoption of equity-informed charging strategies for other campuses and municipalities throughout the Central Valley (and beyond). Finally, the project directly addresses several California climate priorities including (but not limited to) the widespread adoption of zero-emission vehicles (e.g., Executive Order N-79-20), establishing a robust network of publicly available EV charging infrastructure (e.g., Executive Order B-48-18, Assembly Bill 2127), and emphasizing equitable outcomes while addressing climate change (e.g., California Air Resources Board 2022 Scoping Plan).