

Project Title: Information System for Infrastructure Deployment in Support of Future Vehicles

Principal Investigator:

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Center Project Number: Y4-01

Award Amount: \$ 74,822

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Project Summary

Mass production electric vehicles (EVs) will be coming on the market en masse during the next few years. Their adoption will depend on the availability of charging stations. A few cities have started deploying such stations and many are in the planning stage. The decision makers, being city governments, utilities, or private entities such as mall and fast-food restaurant operators, are in need of information systems that will assist them in deploying such an infrastructure, including (1) EV demand consideration, (2) the actual location of stations, (3) the implied service time on car owners, and (4) power grid implications. All of these aspects should be addressed through analytical methodologies, such as discrete choice modeling to capture the demand, optimization for actual location recommendations, and comprehensive simulations to estimate the overall impact on the system. While some of these questions have already been addressed at the macro level, thorough research is required to conduct assessments at the micro level, which is required to actually build the infrastructure.

The developed decision support system and service will be subscription based with a broad market spreading from city governments and municipalities (installing charging stations in public parking spaces, curbside charging), utilities, and private entities (retailers, mall operators, fast-food and restaurant chains, garage owners, etc.). While the actual savings of using analytics for deployment vs. more judgmental approaches are hard to estimate, the proposed system will drastically reduce labor needs, and it will open the door to easily conduct what-if analyses.

The initial phase of the project will be focused on developing such a system for the EVs, however the underlying concepts and methodologies are also applicable to deploying the infrastructure of other possible alternative fuel vehicles (compressed natural gas (CNG), hydrogen, biofuel stations).