Grant Deliverables and Reporting Requirements for UTC Grants

UTC Project Information	
Project Title	Electric Vehicle Sharing Planning and Operations
University	University of South Florida
Principal Investigator	Xiaopeng Li Yu Zhang
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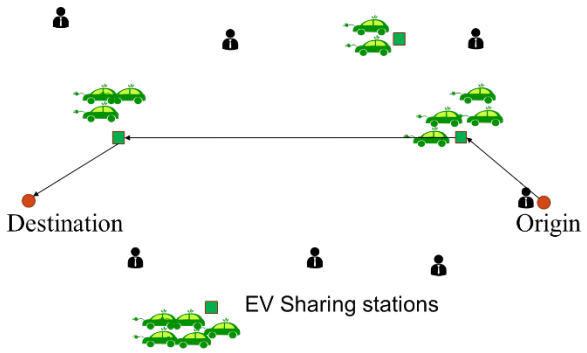
Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT: $47,532 USF: $32,508
Total Project Cost	$80,039
Agency ID or Contract Number	Sponsor Source: Federal Government CFDA #: 20.701 Agreement ID: 69A3551747119
Start and End Dates	Start date: 11/30/2016 End date: 11/29/2017
Brief Description of Research Project	Car sharing has been recognized as a missing link to sustainable transportation that integrates flexibility, mobility and accessibility from private vehicles and economy and sustainability from public transits. The environmental and social benefits of car sharing can be further enhanced by using electric vehicles (EVs). This research aims to propose methodologies and tools for planning, designing and operating EV sharing systems, considering the interdependent relationships among the EV service, the power system, and society. The focus of this research is one-way station based EV sharing. These developments expect to promote clean energy transportation and shared mobility in society. This project has four tasks: (i) First, we will conduct relevant literature review to understand the research frontier and relevant research gaps in this area; (ii) Second, we will analyze problem settings and propose mathematical models; (iii) Third, we will develop an efficient solution approach and (iv) test the proposed models with numerical examples and case studies. The four tasks are planned to be accomplished in two years. The work in the first year (Phase I) will focus on Task i and ii.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	This research is being implemented as planned.  Fig. 1. Illustration of station based one way EV sharing system
Impacts/Benefits of Implementation (actual, not anticipated)	Numerical experiments are conducted with data of Yantai city, China to illustrate the efficiency of the proposed simulation rules, the optimization model and the customized solving algorithm. We found that given a specific set of installed stations and fleet sizes, average objective value of only 40 simulations could approximate the true expectation of system dynamic operation costs very well. Several groups of experiments are conducted to illustrate how the key parameters influence the best feasible cost items, total numbers of built charging stations and deployed vehicles, also the optimal EV sharing system design.
Web Links • Reports • Project website	http://ctech.cee.cornell.edu/final-project-reports/