



CUUATS

CHAMPAIGN URBANA URBANIZED AREA
TRANSPORTATION STUDY

1776 East Washington Street
Urbana, IL 61802

Phone 217.328.3313

Fax 217.328.2426

www.ccrpc.org

To: Scott Tess, Environmental Sustainability Manager for City of Urbana
From: Prateek Mittal, Transportation Planner for CCRPC
Date: January 13, 2015
Re: Feasibility of a Public EV Charging Station in the Champaign-Urbana Urbanized Area

This memo presents a brief summary of a preliminary study to evaluate the feasibility of a public electric vehicle (EV) charging station in the Champaign-Urbana urbanized area. The study consists of three main considerations: location of potential EV owners, target demographic, and limitations of predicting or modeling potential benefits. The broader conclusion of the study is that the need for a public charging station in Champaign-Urbana urbanized area is very small as most of the commuters reside within the driving range of EVs and the target demographic for EVs is also very small in the area. Moreover, due to lack of baseline data, estimating potential benefits of a public charging station is probably not possible.

The need for a public charging station would primarily depend on the length of the commute of current or potential EV owners. With technological innovations, the driving ranges of EVs have been increasing and as such, their users are able to travel increasingly long distances without having to recharge at a public station. For instance, considering a conservative EV driving range of 50 miles, the EV owner can safely travel as far as 20 miles to a workplace and back without having to use a public charging station. To illustrate this point, a simple network analysis was designed for the Champaign-Urbana urbanized area, the results of which are presented in the map attached. Using density of jobs in the urbanized area, major employment centers were identified, and service areas were estimated for each employment center based on driving distance to the employment center. As presented in the map, a 20-mile service area covers almost the entire Champaign County. Also shown on the map is a larger 40-mile service area designed to reflect driving ranges of newer EVs. The 40-mile service area extends well beyond the Champaign County boundary and includes large portions of the surrounding counties. As such, almost all commutes to major employment centers in the urbanized area are very much within the range of most EVs which reduces the demand for a public charging station.

Being significantly more expensive than conventional vehicles, the target demographic for EVs is very small. As many as 70% to 80% of current EV owners are households that have annual incomes higher than \$100,000, and about 50% have annual incomes higher than \$150,000^{1,2,3}. According to the ACS 2008-12 data, in Champaign County, out of about 79,267 households only 14,541 are estimated have income greater than \$100,000 and only about 5,636 households have incomes greater than \$150,000. Moreover, only about 2000 of the households that have incomes greater than \$100,000 are located further than 10 miles away from

¹Institute of Transportation Studies of UC Davis, 2013, *Who Is Buying Electric Cars in California? Exploring Household and Vehicle Fleet Characteristics of New Plug-In Vehicle Owners*.

²International Council of Clean Transportation, 2012, *Consumer Acceptance of Electric Vehicles in the US*

³Center for Sustainable Energy, California Environmental Protection Agency, 2012, *California Plug-In Electric Vehicle Owner Survey*

the major employment centers in the urbanized area. As such, the target demographic for EVs is very limited in Champaign County. Moreover, unlike in big densely populated cities, most of the population in Champaign County lives in single-family residential developments where EV owners are much more likely to have a private charging station at their homes further reducing the need for a public charging station.

The other important issue is the lack of appropriate framework or even relevant data to reliably estimate benefits of installing a public charging station. Currently, there is no data available to estimate current ownership of EVs in the area and as such, it is difficult to predict future ownership of EVs. The lack of baseline data also makes it impossible to reliably estimate change in EV ownership in response to adding a public charging station. Moreover, given the very narrow target demographic, benefits accrued such as lower GHG emissions would likely be too small to be measured at the county-level or even at the city-level which are the geographical areas at which GHG emissions are currently estimated. As such, overall, it is very difficult to quantify potential benefits of a public charging station.

Electric Vehicle Commuting Distances

