# Electric Vehicle (EV) Charging Hotspots

Overview

This report develops a methodology for identifying potential electric vehicle (EV) charging hotspots. These hotspots are defined as places where EV motorists may park for some duration and places with the wherewithal to install one or more EV charging stations. Using Geographic Information Systems (GIS) analysis we mapped charging hot spots using block level census data for New Castle County, Delaware and Cecil County, Maryland. The map below illustrates the hotspots. Later in the report, we will review the index used to create it, as well as provide profiles of the dozen hotspots identified.

EV Charging Hotspots, WILMAPCO Region

Total Points Per Census Block

- 9 to 13
- 6 to 9
- 3 to 6

Source: U.S. Census, WILMAPCO
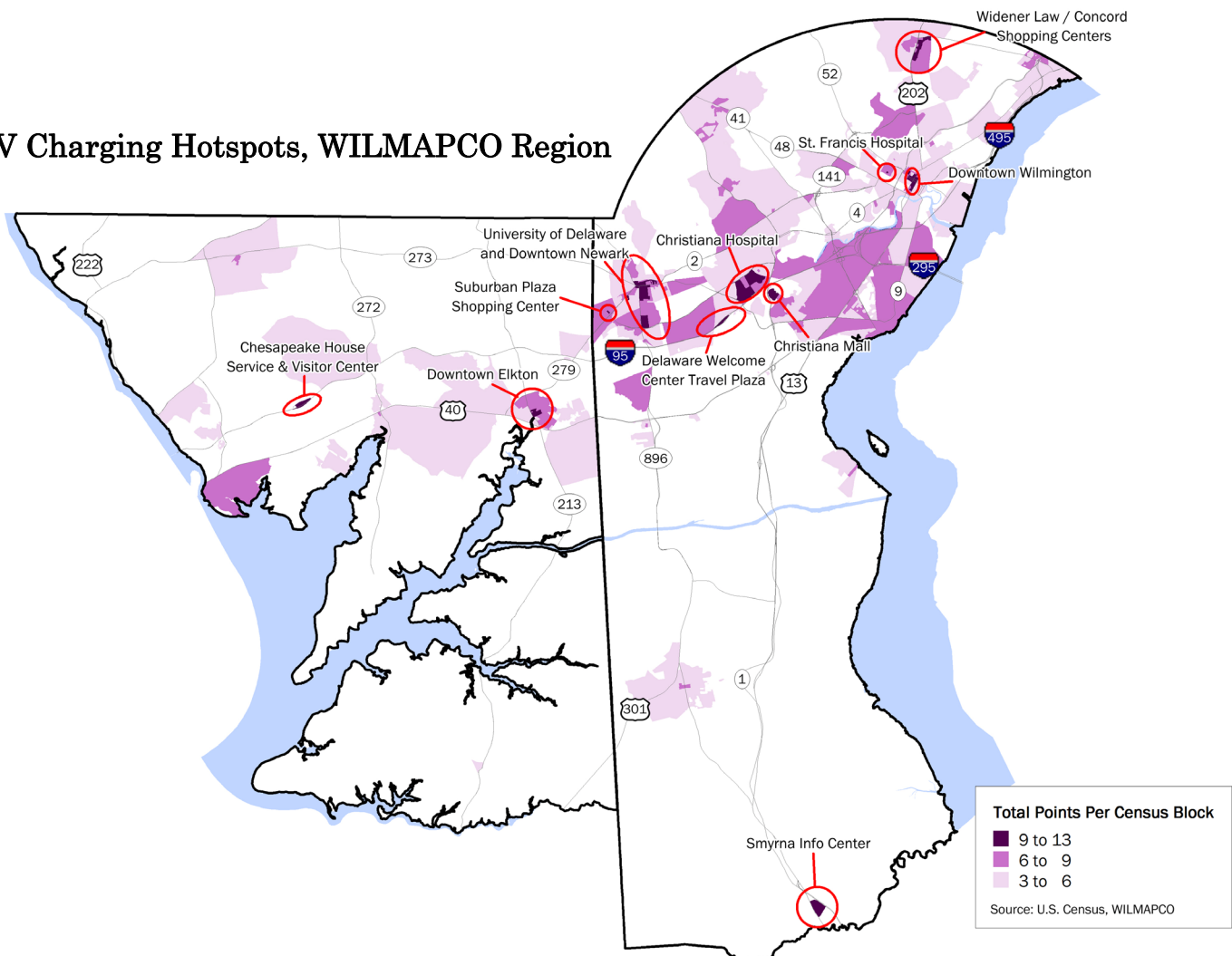
EVs in the United States

EVs are a growing segment of the private vehicle industry. The Environmental and Energy Study Institute notes that more than 200,000 plug-in vehicles were sold in the U.S., as of May 2014. EVs are part of the solution to reducing our greenhouse gas emissions, one-third of which are released by the transportation sector. Indeed, today's EV owners often cite awareness of their personal contributions to global warming as a key motivating factor in their purchase, according to a 2012 Electric Vehicle Information Exchange (EVIX) survey. That same survey found that today's typical owner is a middle-aged white male, with above average-income and education.

Widespread adoption of EVs has been hindered by their cost, unfamiliarity with the technology and their limited range. As the technology develops these concerns should evaporate.

The present report is among other efforts underway to help build a skeleton EV charging network to decrease "range anxiety" among consumers. Charging stations are generally plentiful in large cities, such as Baltimore and Philadelphia, but are few and far between in suburban, rural and small urban places like the WILMAPCO region. According to PlugShare.com, there were only four public charging stations across the region in June 2014.

Types of Charging Stations

The vast majority of daily EV trips occur on a charge made at home. The range of EVs (50 miles to 70 miles) provides most motorists plenty of energy for a trip to work, an errand or two, and the return home. Public charging stations will generally only be utilized to extend trips on the odd day when a lengthy trip occurs.

There are different charging levels, each with varying charging speeds and costs. Home charging from a regular electric socket, Level 1 (4.5 mi/hr), generally involves an overnight charge. Level 2 (26—75 mi/hr) charging stations are found both in homes and in public places. These units typically cost under $3,000 for purchase and installation. Direct current (4 mi/min) stations, the fastest available, are found in public places and require a $30,000 investment per unit, excluding installation.

pluginamerica.com

A 6 kW (Level 2) public charging station

EV Charging Hotspot Index

An index was created to identify EV charging hotspots. Work from the Georgetown Climate Center's land-use cluster analysis informed the selection of factors, along with consultation from the University of Delaware and member agencies. Generally, we sought out places with the ability and desirability to host a public charging station. Below is a listing of the factors in our EV charging index.

Expressway Rest Areas

- 9 points
- Air photo identified

Employment

- 2 – 6 points (scaled by number of jobs)
- Cropped Traffic Analysis Zones

Shopping

- 1 – 5 points (scaled by land area)
- Cropped atlas destination polygons

Downtown

- 3 points
- Downtown or Main Street Program

Hotels

- 1 – 2 points (scaled by land area)
- Cropped polygons

Hospitals

- 1 – 2 points (scaled by land area)
- Cropped polygons

Universities

- 2 points
- Cropped polygons

Municipalities

- 1 point
- Political boundaries

EV Charging Station Hotspots

Census blocks were scored individually using the index in a Geographic information Systems (GIS) analysis. High-scoring, nearby blocks were joined together to form "hotspots." These places, which are mapped on page 1, warrant more exploration as possible locations for EV charging units. Below are profiles of the main feature within these identified blocks.

Delaware Welcome Center

- Index points: 13

- Location: I-95 (between Wilmington and Newark)

- Ownership: State

- This location is already home to a Tesla charging station. Additional stations are already planned.

ediscompany.com

University of Delaware

- Index points: 10—13

- Location: Newark

- Ownership: Private

- The largest university in the region is already home to a charging station. Many more opportunities exist on this sprawling campus.

udel.edu

Downtown Elkton

- Index points: 9—12

- Location: Elkton

- Ownership: Mixed

- Elkton's downtown is home to many small businesses, public offices, a community hospital, and residential dwellings.

wikipedia.org

EV Charging Station Hotspots (continued)

Chesapeake House Visitor Center

- Index points: 11
- Location: I-95 (between Elkton and Perryville)
- Ownership: State
- Currently closed for renovations.

Widener Law/Concord Pike Shopping

- Index points: 10—11
- Location: US 202
- Ownership: Private
- This stretch of US 202 in North Wilmington is home to much retail activity, a law school, and hotels.

Smyrna Rest Area

- Index points: 9—11
- Location: Smyrna
- Ownership: State
- This rest area serves north/south travelers in Delaware. Limited amenities are in place.

EV Charging Station Hotspots (continued)

Downtown Newark

- Index points: 11

- Location: Newark

- Ownership: Mixed

- Downtown Newark is home to a mix of businesses, housing, hotels, and offices.

bikede.org

Downtown Wilmington

- Index points: 10

- Location: Wilmington

- Ownership: Mixed

- Wilmington's Downtown has the region's largest concentration of jobs, along with a collection of shops and housing.

wikipedia.org

Christiana Hospital

- Index points: 9

- Location: Christiana

- Ownership: Private

- With more than 900 beds, Christiana Hospital is the region's largest medical campus.

seiberlich.com

EV Charging Station Hotspots (continued)

Christiana Mall

- Index points: 9

- Location: Christiana

- Ownership: Private

- This sprawling regional shopping mall is located outside of Wilmington along Interstate 95.

delawareonline.com

St. Francis Hospital

- Index points: 9

- Location: Wilmington

- Ownership: Private

- A 224 bed community hospital, St. Francis is located in Wilmington's densely packed Westside.

skyscrapercity.com

Suburban Plaza

- Index points: 9

- Location: Newark

- Ownership: Private

- This neighborhood shopping center is located on the edge of Newark along South Main Street.

suburbanplazade.com

Implementation Challenges

- Availability of grant funding

- Resistance from landowners

- Removal of existing parking

- Installation costs

- Signage

- Charging etiquette

Next Steps

This data report has developed a methodology for identifying EV charging hotspots. Governments should consider its findings while supporting the installation of EV infrastructure. Likewise, it should partly inform decisions for private businesses, regarding the potential use of an EV station at a particular location, such as the Christiana Mall.

Most EV charges will continue to take place in homes. In the policy realm, governments should consider strongly code revisions to encourage the installation of EV charging stations in places such as multifamily developments.

The Wilmington Area Planning Council (WILMAPCO) is a Metropolitan Planning Organization serving New Castle County, Delaware and Cecil County, Maryland.

This data report is part of a series of which summarizes key data to allow both residents and decision-makers to better understand our region.

Other data reports are available at: www.wilmapco.org/data-reports.

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