



EV Planning and Readiness in Southeastern Pennsylvania

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DVRPC Region

(Project Area Highlighted)



Readiness Plan – Ready to Roll

- DVRPC
- PECO Energy
- GPCC
- City of Philadelphia

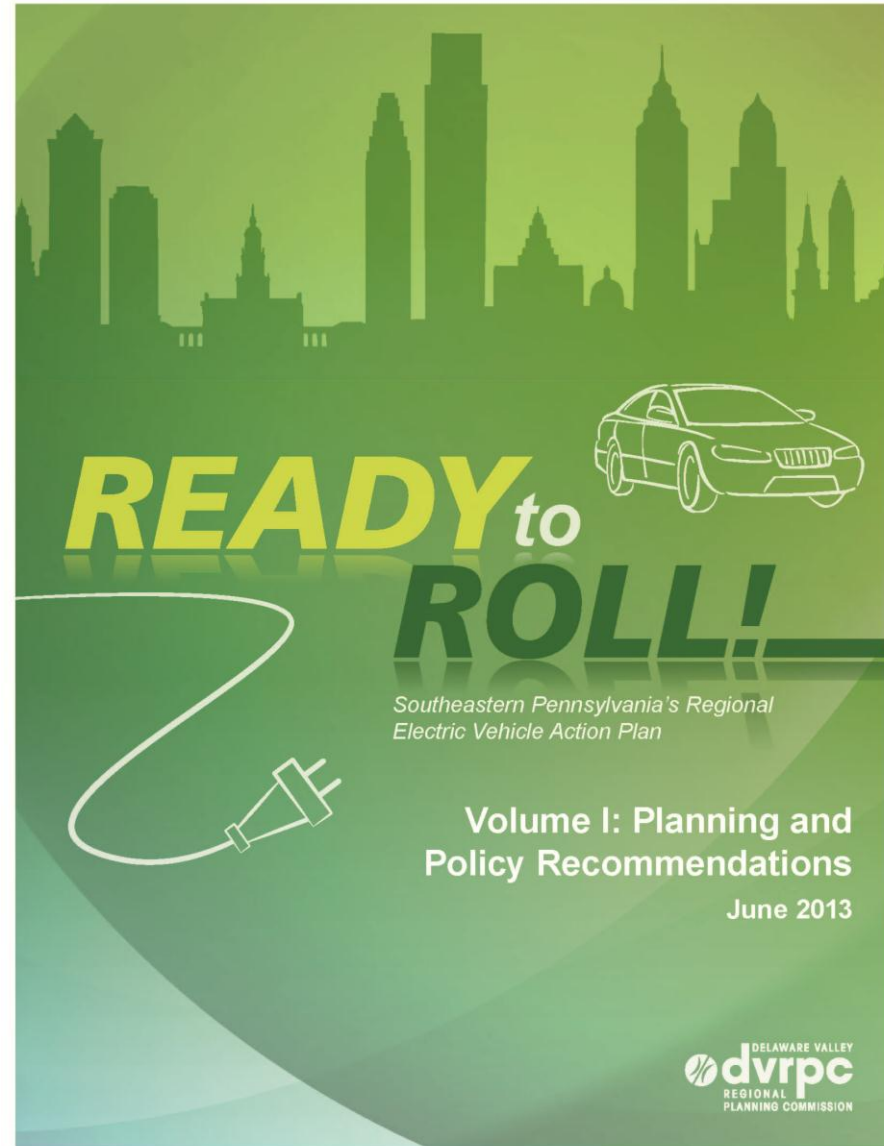
Completed June 2013

“Jump start” analysis – PECO

- Key Infrastructure Issues

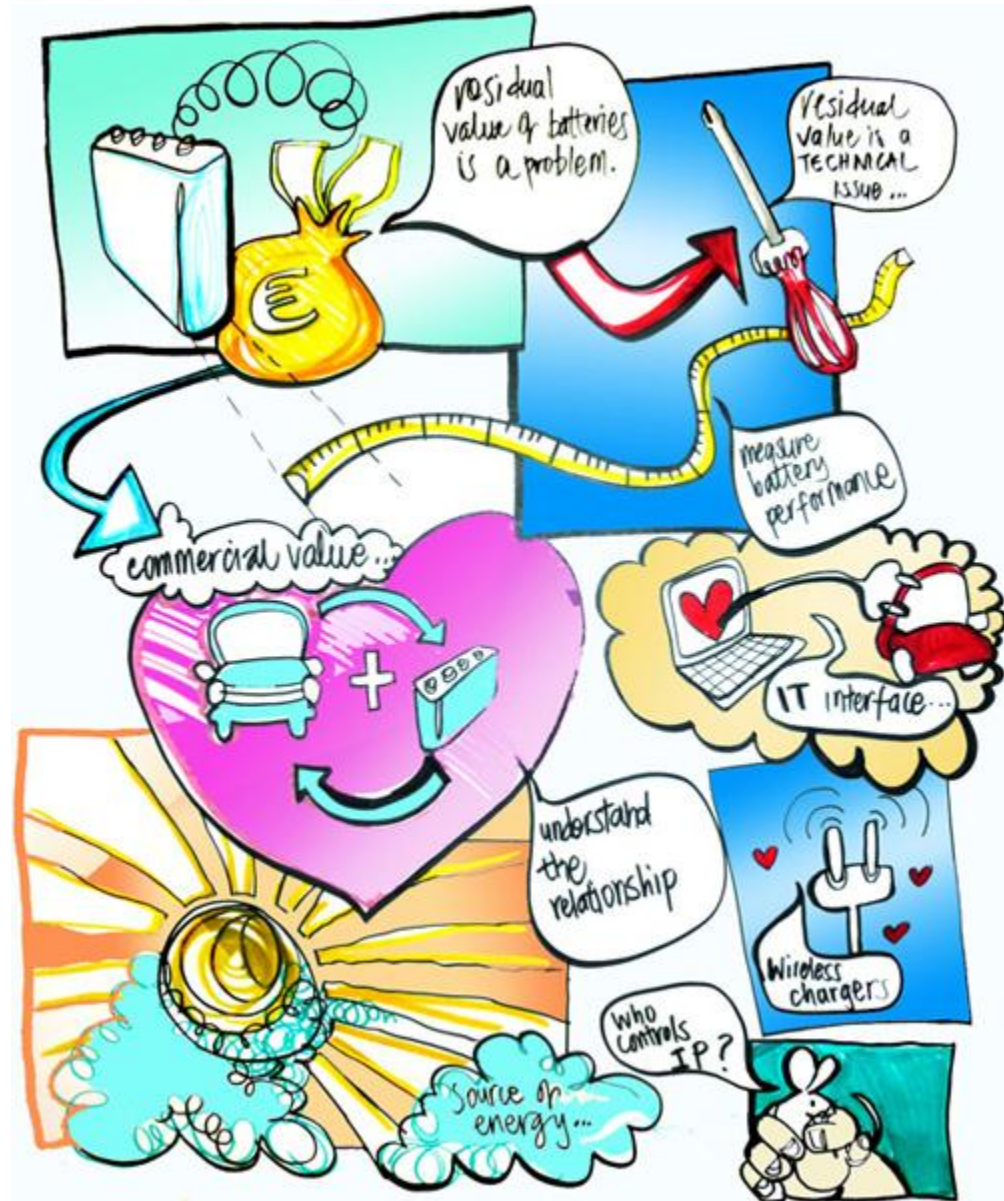
The EV Project

- Steering Committee
- Shared information on our work
- Learned from their experience

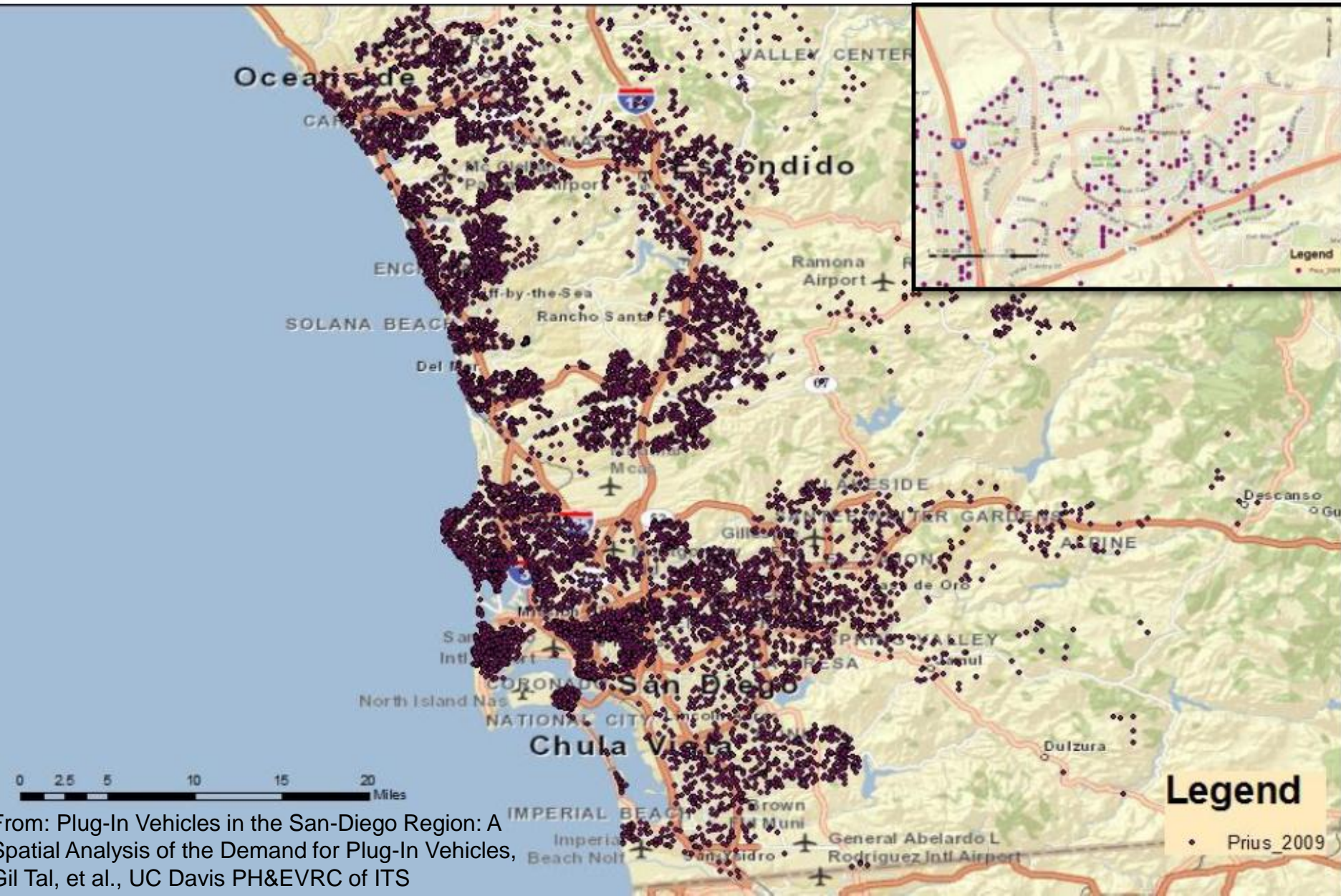


EV Questions

- How are they different from other cars?
- What do local governments need to know?
- Where will EV owners live?
- Where, other than home, might they want to charge?
- Where can EVs replace ICE vehicles?
- How will EVs affect the electric distribution grid?



Hybrid Ownership Distribution



From: Plug-In Vehicles in the San-Diego Region: A Spatial Analysis of the Demand for Plug-In Vehicles, Gil Tal, et al., UC Davis PH&EVRC of ITS

Plug-In Vehicle Distribution

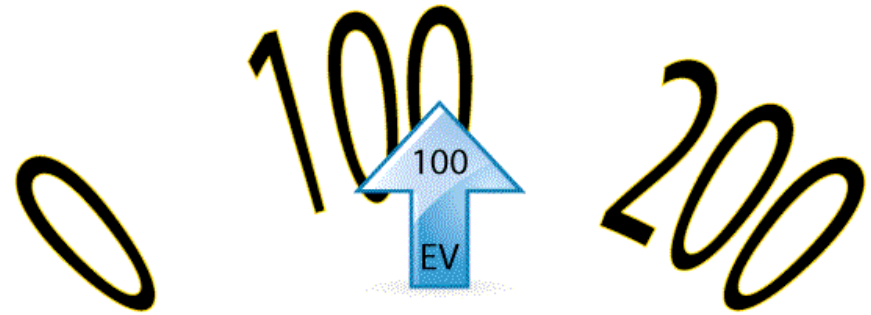


From: Plug-In Vehicles in the San-Diego Region: A Spatial Analysis of the Demand for Plug-In Vehicles, Gil Tal, et al., UC Davis PH&EVRC of ITS

“EV Ownership Potential” Score

Income and hybrid ownership key

Income:	60%
Hybrids	25%
Home Ownership	6%
Dwelling Type	6%
Education	3%



Combined with national/regional EV sales forecasts to predict number and distribution of vehicles.

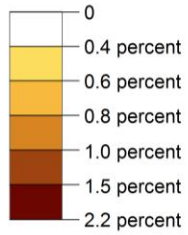
Data Sources:

2,225,595 passenger cars registered in 5 counties

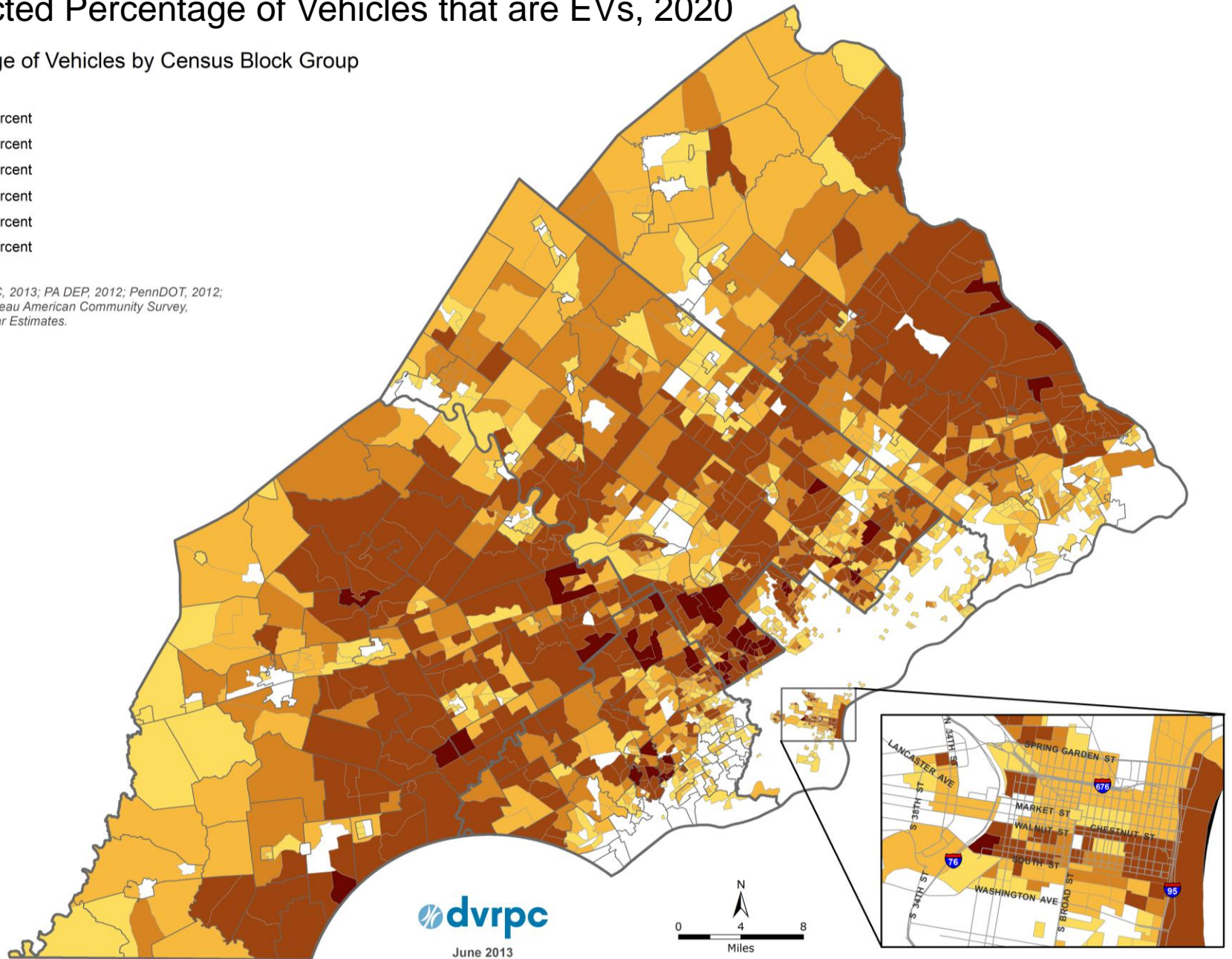
US Census – American Community Survey

Projected Percentage of Vehicles that are EVs, 2020

Percentage of Vehicles by Census Block Group



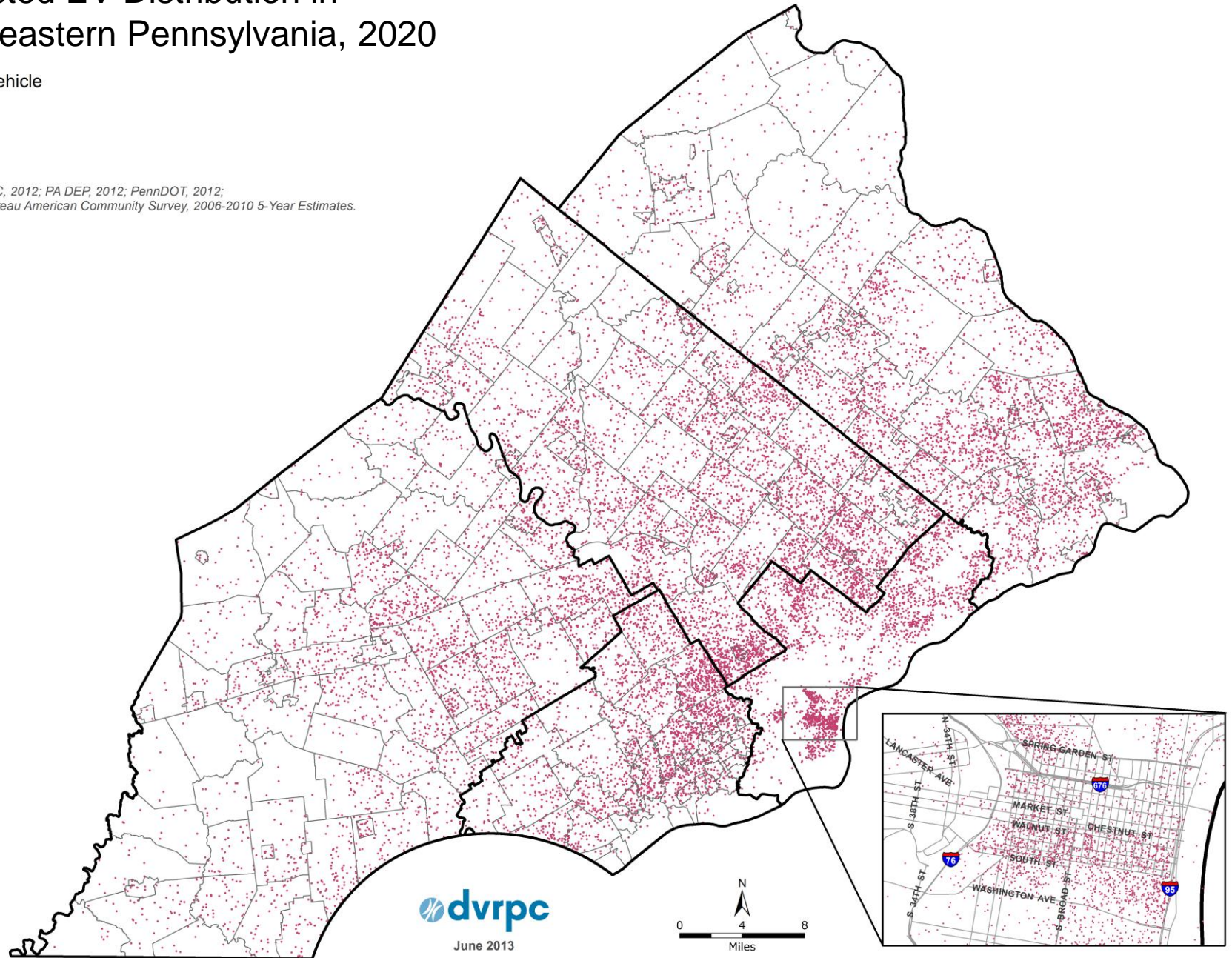
Sources: DVRPC, 2013; PA DEP, 2012; PennDOT, 2012;
U.S. Census Bureau American Community Survey,
2006-2010 5-Year Estimates.



Projected EV Distribution in Southeastern Pennsylvania, 2020

1 Dot = 1 Vehicle

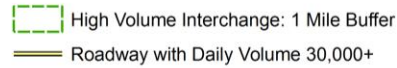
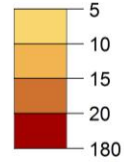
Sources: DVRPC, 2012; PA DEP, 2012; PennDOT, 2012;
U.S. Census Bureau American Community Survey, 2006-2010 5-Year Estimates.



Areas with Highest Potential for Public and Workplace Charging

Based on High Volume Interchanges and Roads, Employment Density, and Major Destinations

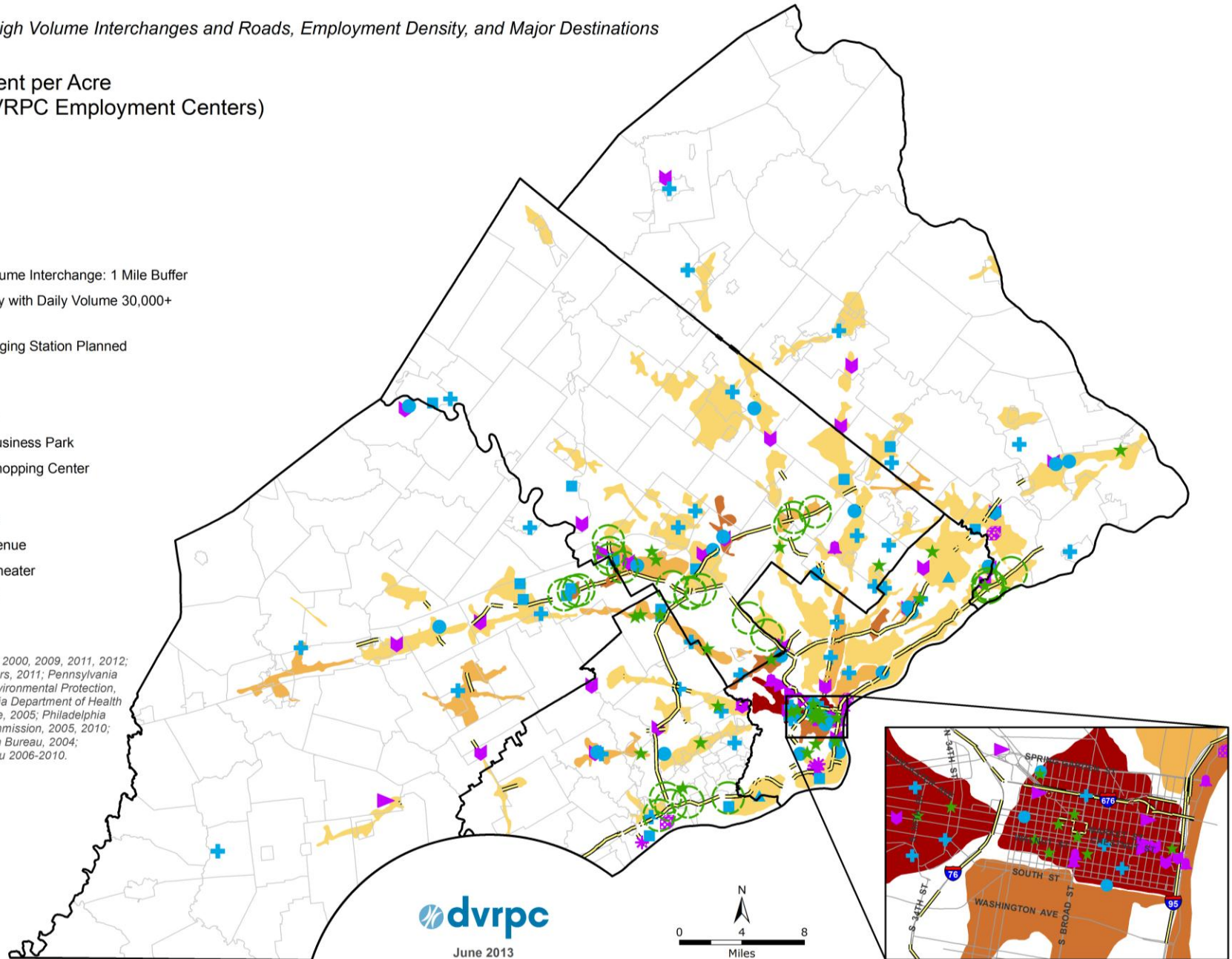
Employment per Acre (within DVRPC Employment Centers)



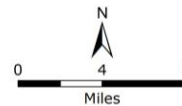
★ EV Charging Station Planned

- ▲ Airport
- + Hospital
- Major Business Park
- Major Shopping Center
- ◆ Casino
- ▼ Museum
- Music Venue
- ▼ Movie Theater
- * Stadium

Sources: DVRPC, 2000, 2009, 2011, 2012; FAA, 2009; Hoovers, 2011; Pennsylvania Department of Environmental Protection, 2012; Pennsylvania Department of Health and Public Welfare, 2005; Philadelphia City Planning Commission, 2005, 2010; National Research Bureau, 2004; US Census Bureau 2006-2010.



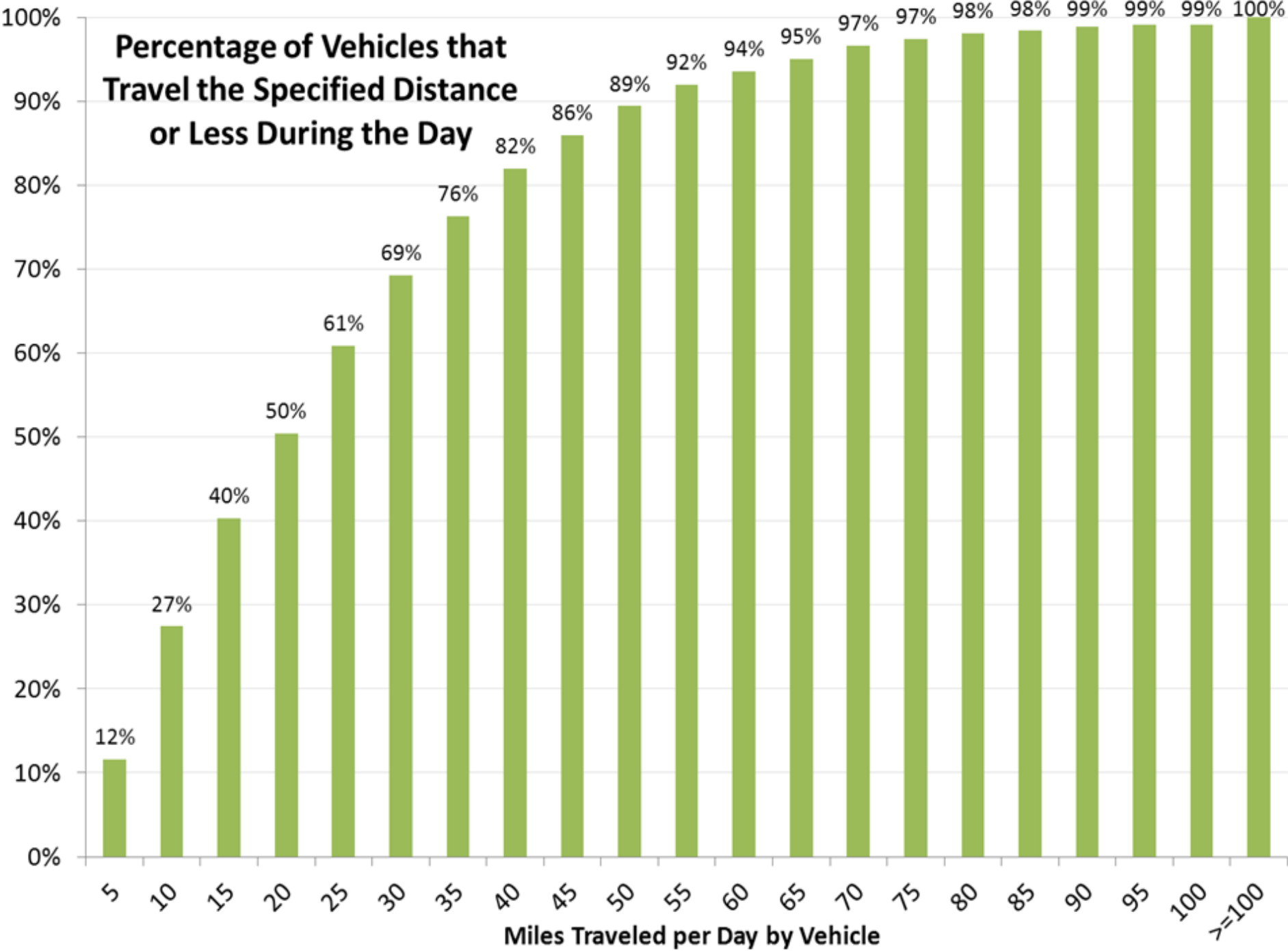
June 2013



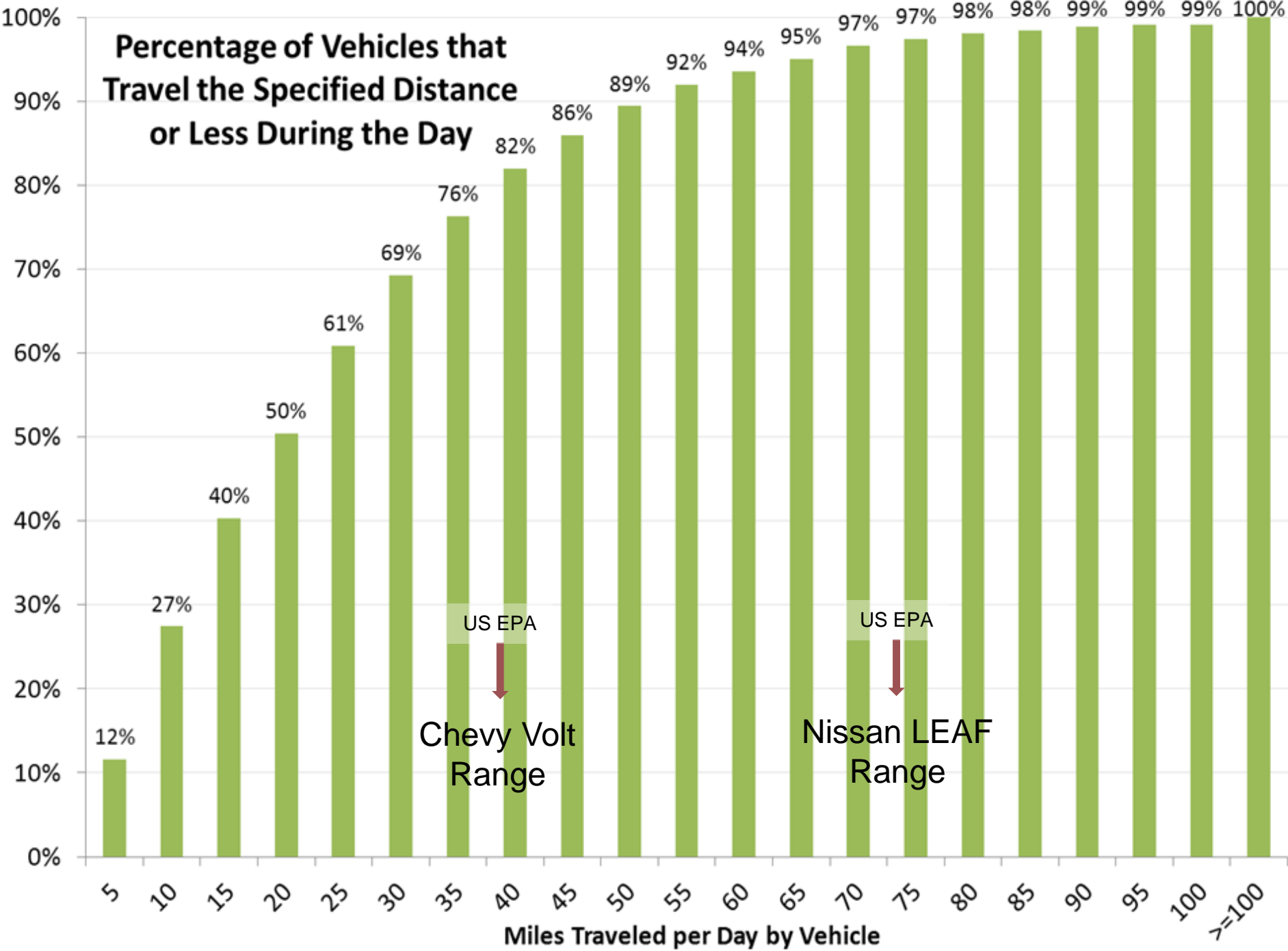
Driving and Parking Habits

- DVRPC Household Survey – 2588 vehicles in 5 counties
- Based on a 24 hour diary and follow-up phone interview with households.
- From 2000 – New survey in the field right now
- Provides data on each trip taken for all modes.

Percentage of Vehicles that Travel the Specified Distance or Less During the Day



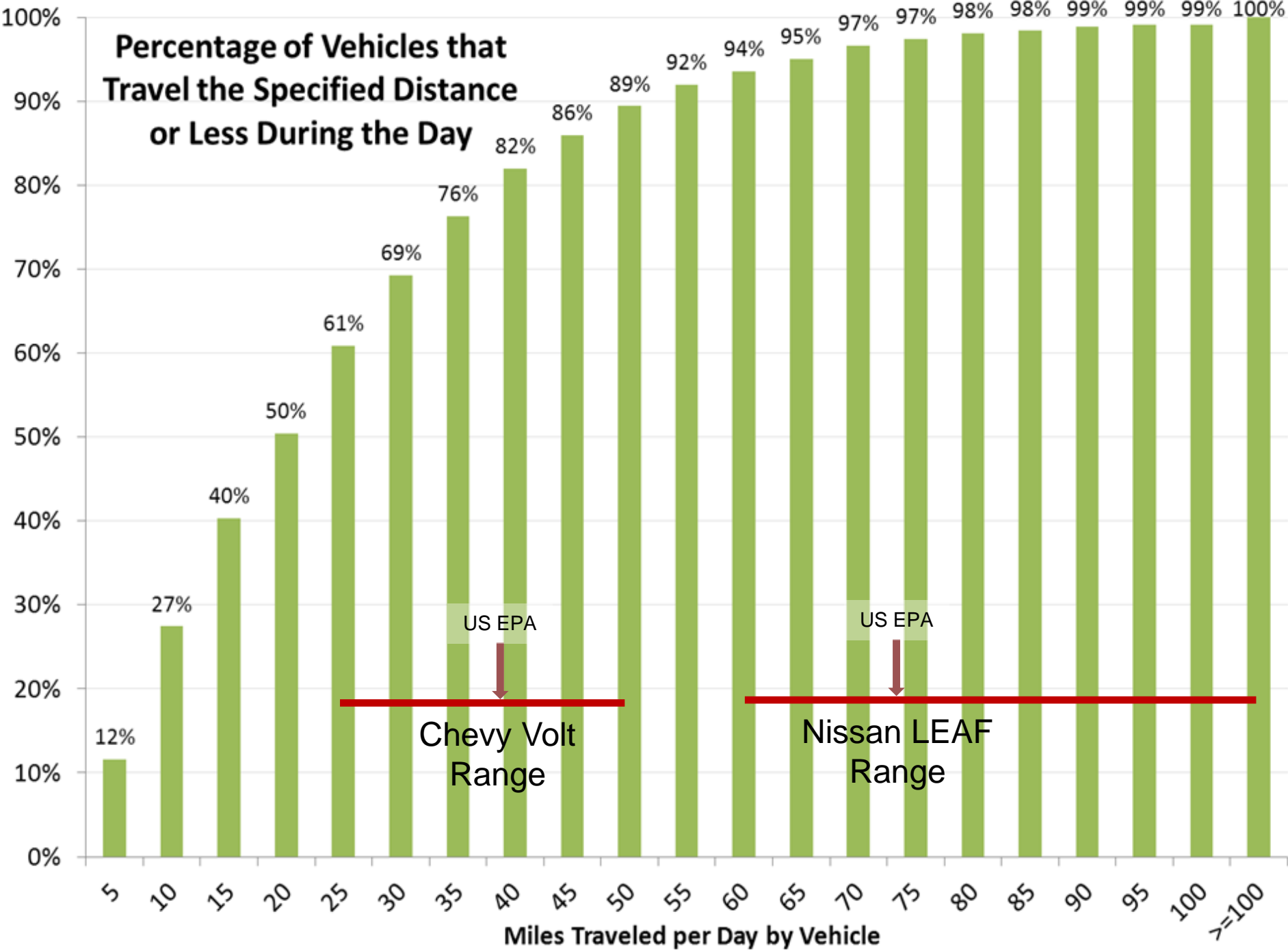
Percentage of Vehicles that Travel the Specified Distance or Less During the Day



US EPA
Chevy Volt Range

US EPA
Nissan LEAF Range

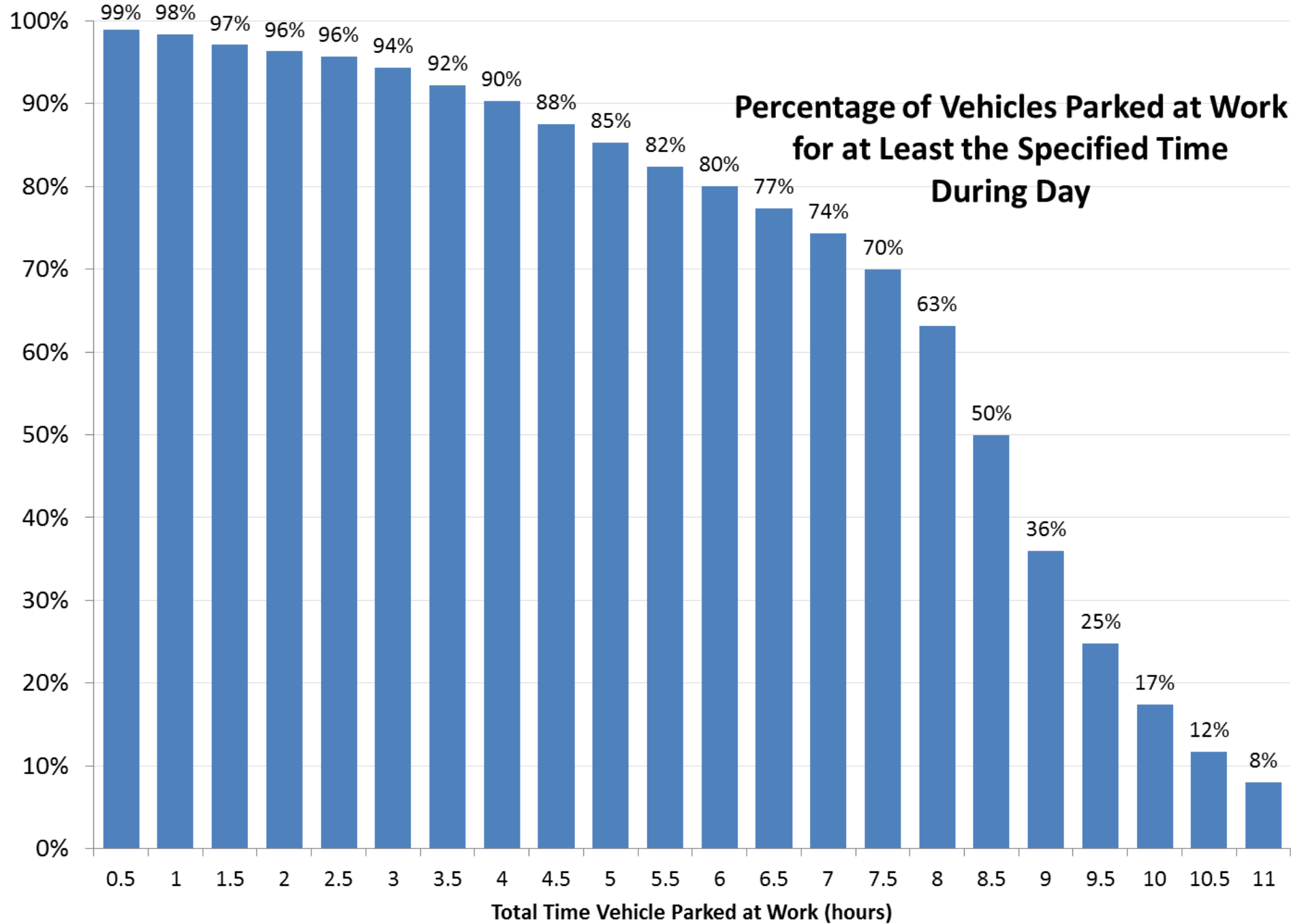
Percentage of Vehicles that Travel the Specified Distance or Less During the Day



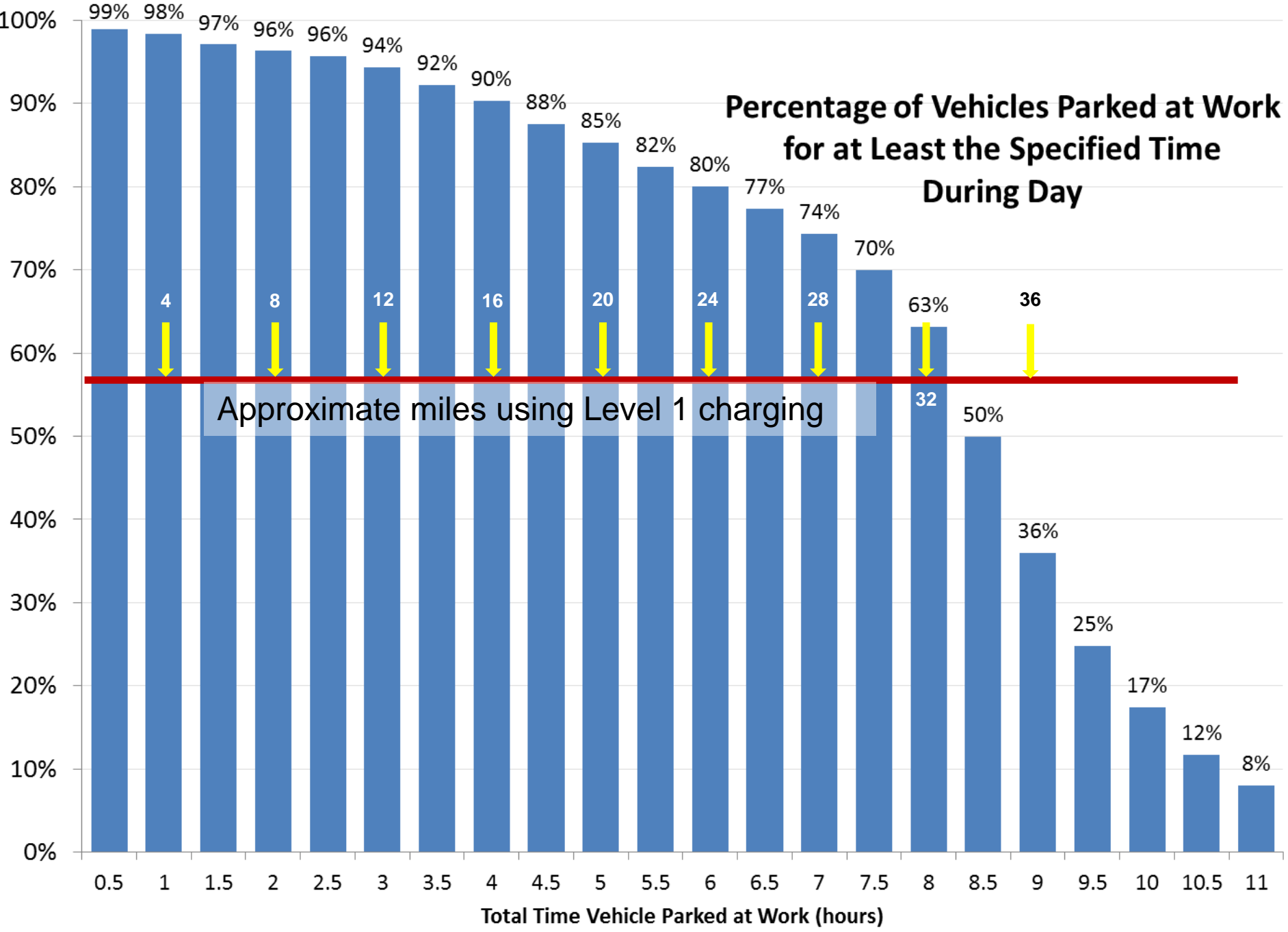
Chevy Volt Range

Nissan LEAF Range

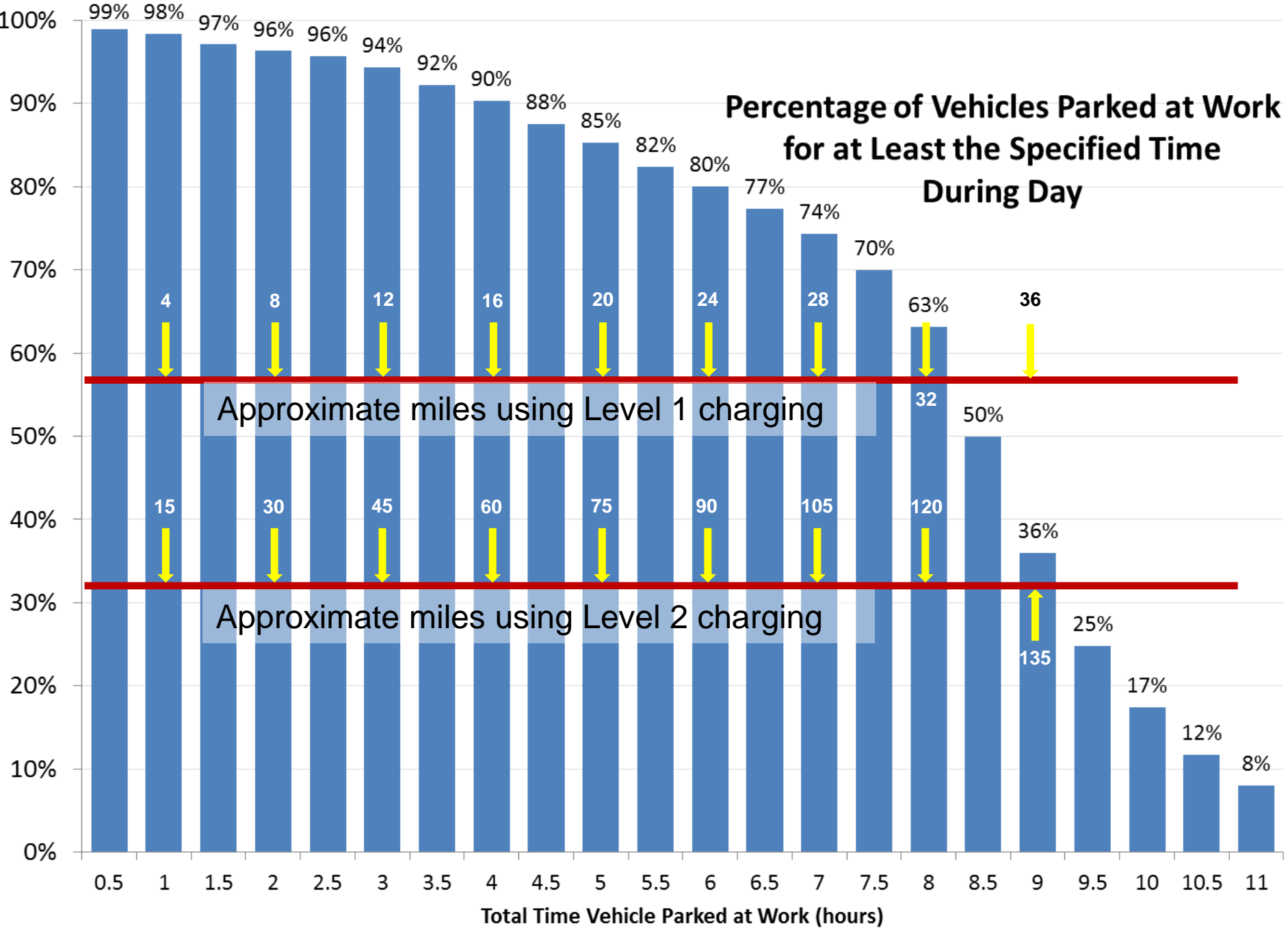
Percentage of Vehicles Parked at Work for at Least the Specified Time During Day



Percentage of Vehicles Parked at Work for at Least the Specified Time During Day



Percentage of Vehicles Parked at Work for at Least the Specified Time During Day



Combination of Distance and Time Parked

Combinations of Distance Traveled and Time Parked in SE PA

Distance Traveled (miles)	40 or less	40 or less	70 or less	70 or less
Time Parked at Work (hours)	4 or more	6 or more	4 or more	6 or more
Portion of vehicles meeting both criteria	71%	64%	88%	78%

Conclusions:

- Many vehicles in the region can readily be replaced by EVs.
- Many Volt (and other PHEV/EREV) users can get by with only Level 1 at home charging.
- Many LEAF (and other AEV) users can likely get by with only Level 2 at home charging (no work charging).
- Most at work charging need can be met by Level 1, both for PHEV/EREV users and AEV users.

Overall lessons for MPOs

- Vehicle registration data and demographic information can identify likely locations of EV owners.
- Traffic and employment data, together with key venue locations can identify the most promising locations for away from home charging, both workplace and “opportunity” charging.
- Household travel surveys can help gauge the prospects for EVs and the relative need for Level 1 vs. Level 2 workplace charging.

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