

# Tracking National Household Vehicle Usage in Support of Market Assessments for Plug-in Electric Vehicles with Emerging Usage of Shared Services



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# Why Vehicles are Not Used

## Electric vehicles require high usage to pay-off

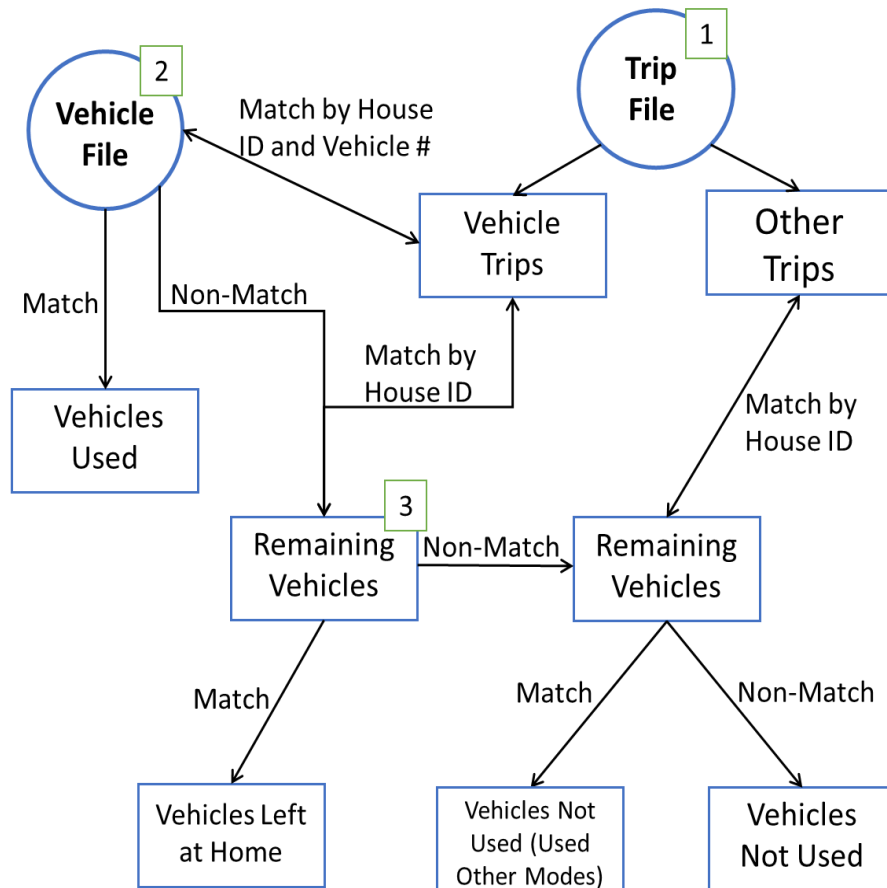
- ❑ Both our 2009 NHTS and 2017 NHTS shows about 40% of household vehicles were “not used” on the survey travel day
- ❑ Higher purchase price of PEV requires high usage rates to pay off the investment in the technology
  - the sales weighted average price of a BEV100 was about 1.4 times that of a conventional car in 2016
- ❑ Mobile devices have made the use of ride sharing or car sharing very attractive, which may reduce vehicle usage
- ❑ NHTS2017 added questions about the frequency of a traveler’s use of rideshare or car share services

***Q: Why household vehicles were not used in a given travel day?***

***What vehicles were used most? And***

***What are the contributing factors? vehicle type, age, travel day, residential location, and population density***

# WE DIVIDED VEHICLE USAGE INTO FOUR CATEGORIES, USED V.S. 3 NON-USED GROUPS



- ❑ **Vehicle Used:** vehicles with or without reported travel time and distance
- ❑ **Vehicle Not-Used:** All others are called “vehicles not used.”
  - ❑ **Left at home,** when household member drove other vehicles
  - ❑ **Used other modes,** when household member used other modes
  - ❑ **No household trips**

# OVERALL VEHICLE USAGE INCREASED SLIGHTLY FROM 2009 TO 2017, NEW VEHICLES INCREASED MORE THAN OLDER VEHICLES

- ❑ Overall vehicle usage increased slightly from 2009 NHTS (60.1%) to 2017 NHTS (62.3%)
- ❑ Usage rate of new vehicles increased more than older vehicles
- ❑ *There were less new vehicles in 2017 NHTS, 51.1%, comparing to 61.6% in 2009 NHTS*

	2017 NHTS		2009 NHTS	
	≤10 Years	>10 Years	≤10 Years	>10 Years
<b>Used (%)</b>	<b>36.4%</b>	<b>25.9%</b>	<b>41.4%</b>	<b>19.5%</b>
<b>Not Used (%)</b>	<b>14.7%</b>	<b>23.0%</b>	<b>19.7%</b>	<b>19.4%</b>
<b>Percent of Total</b>	<b>51.1%</b>	<b>48.9%</b>	<b>61.6%</b>	<b>38.9%</b>

## BREAKDOWN OF HOUSEHOLD TRAVEL BY VEHICLE AGE GROUP§

<b>Used (%)</b>	<b>71.3%</b>	<b>53.0%</b>	<b>67.8%</b>	<b>50.2%</b>
<b>Not Used (%)</b>	<b>28.7%</b>	<b>47%</b>	<b>32.2%</b>	<b>49.8%</b>

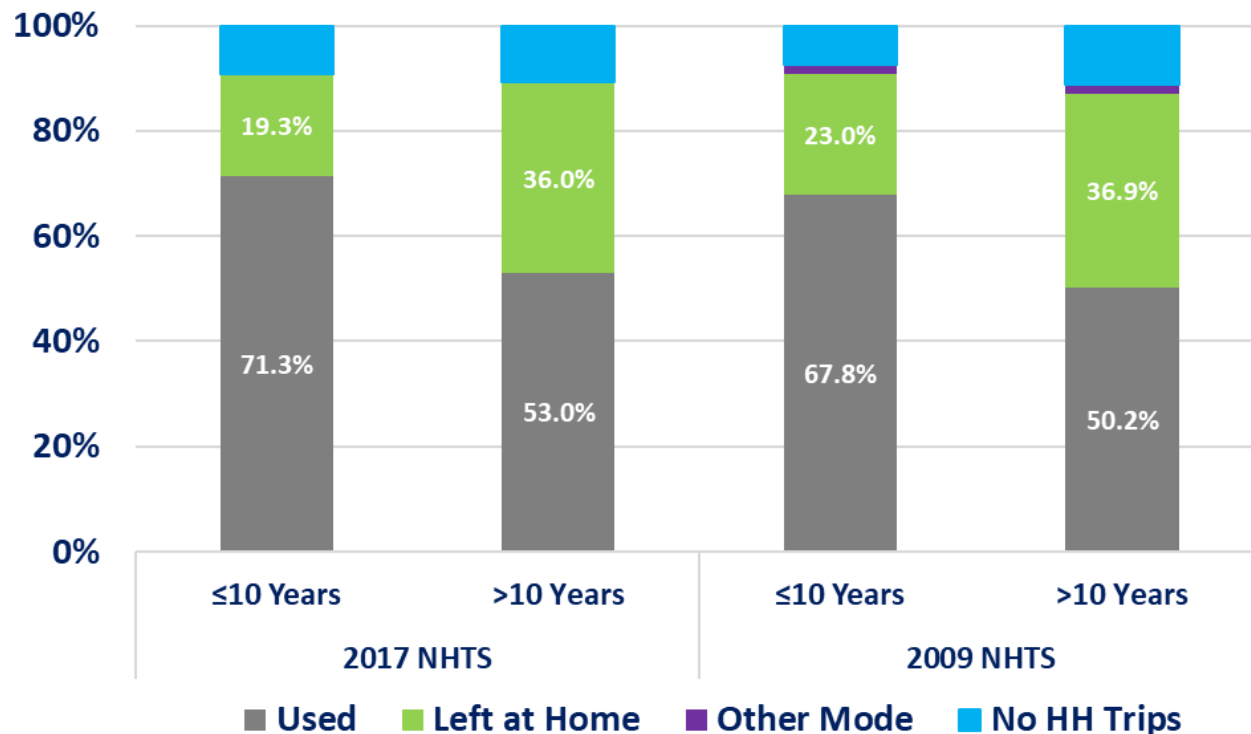
§ Each age group percentages add to 100

# MOST VEHICLES, ESPECIALLY OLDER ONES, NOT USED IN THE SURVEY ARE “LEFT AT HOME”

Most vehicles, especially older ones, not used in the survey are “left at home” when household members used another vehicle

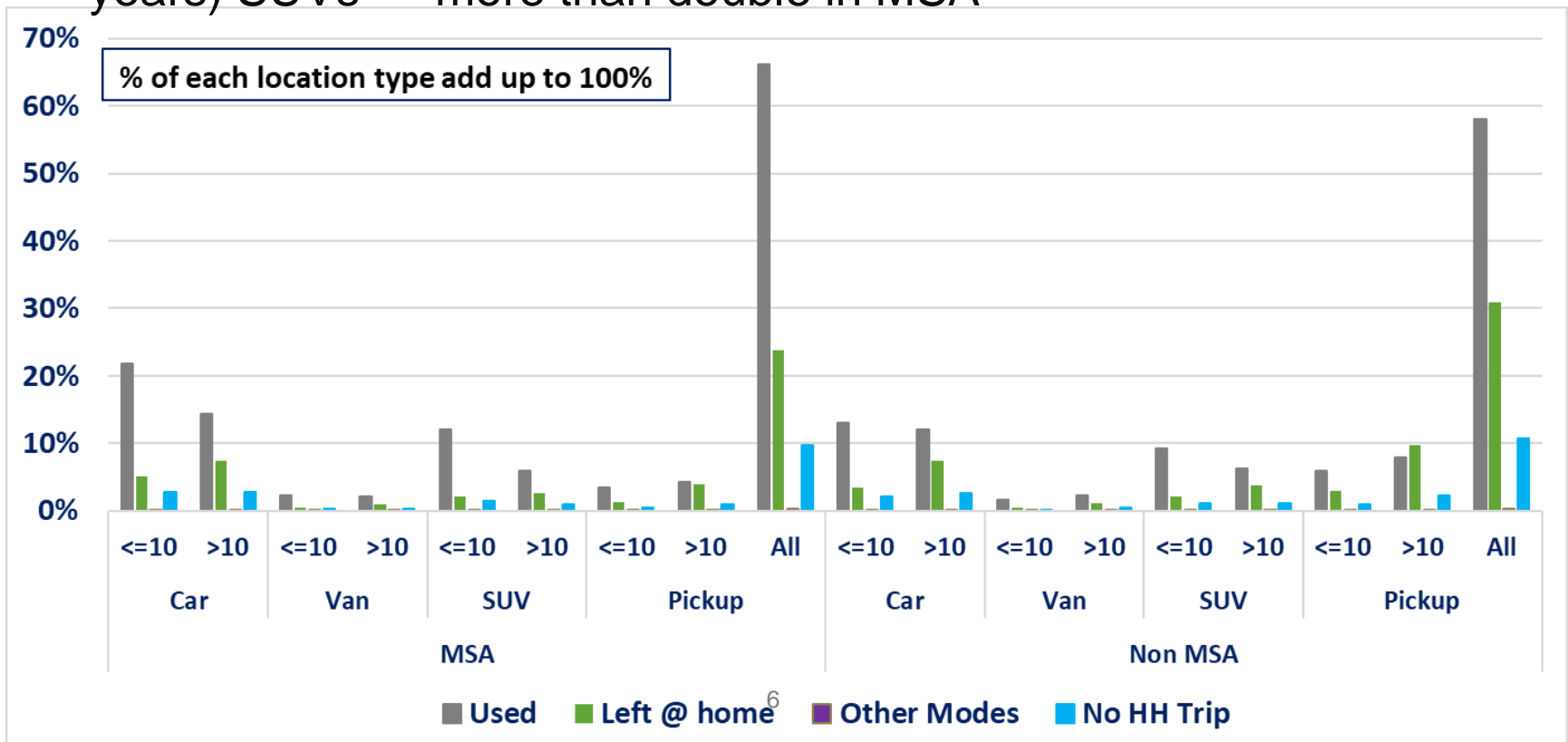
The main reason of overall increase in vehicle usage:

**% of vehicles “Left @ home” and Household members used “Other Modes” decreased sharply in 2017.**



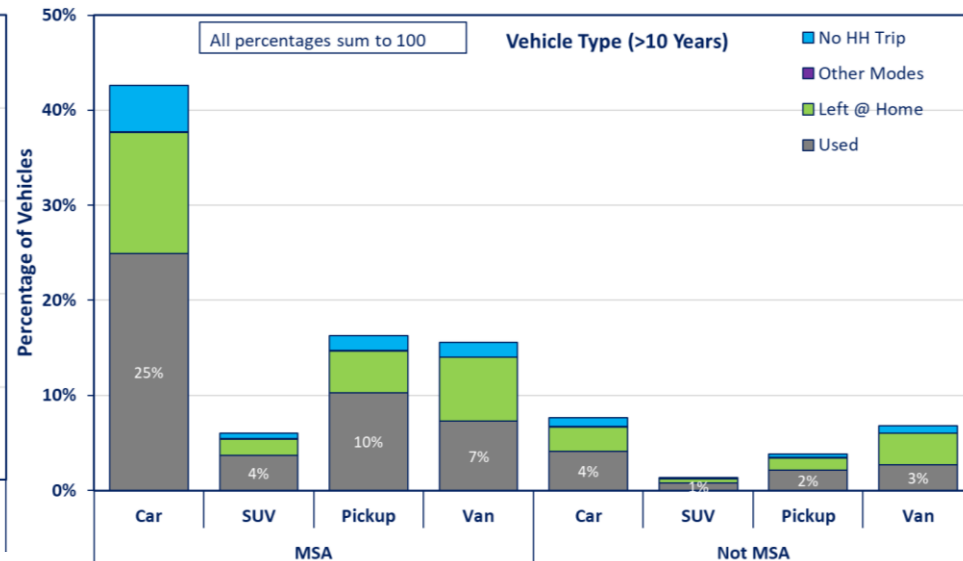
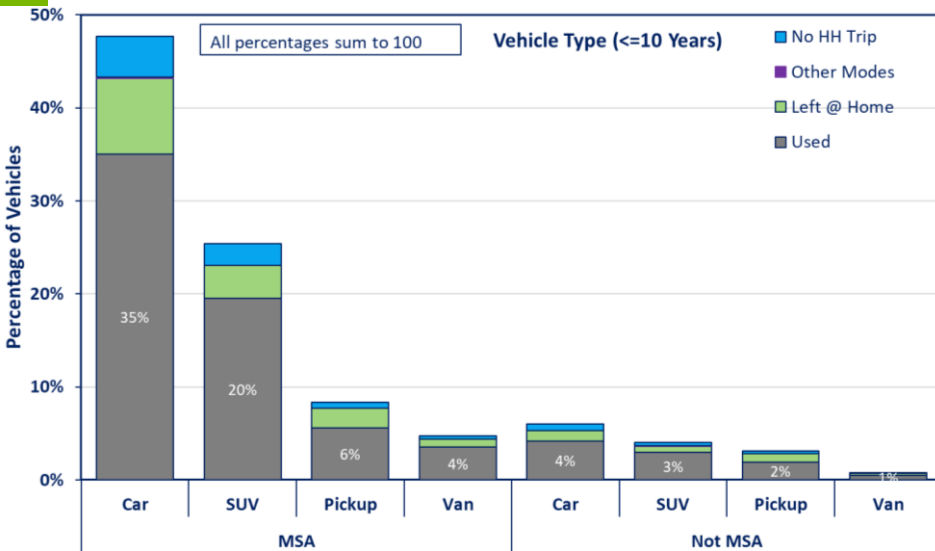
# THE TOTAL USAGE RATE SHARPLY DECREASE FROM 76.9% IN MSA TO 58.1% MAINLY DUE TO THE SIGNIFICANT INCREASE OF “LEFT AT HOME” IN NON-MSA

- The usage rates of car and SUV drop more sharply from the ≤10-years to >10-years groups in an MSA
- Newer (≤10 years) SUVs are more frequently used than older (>10 years) SUVs — more than double in MSA



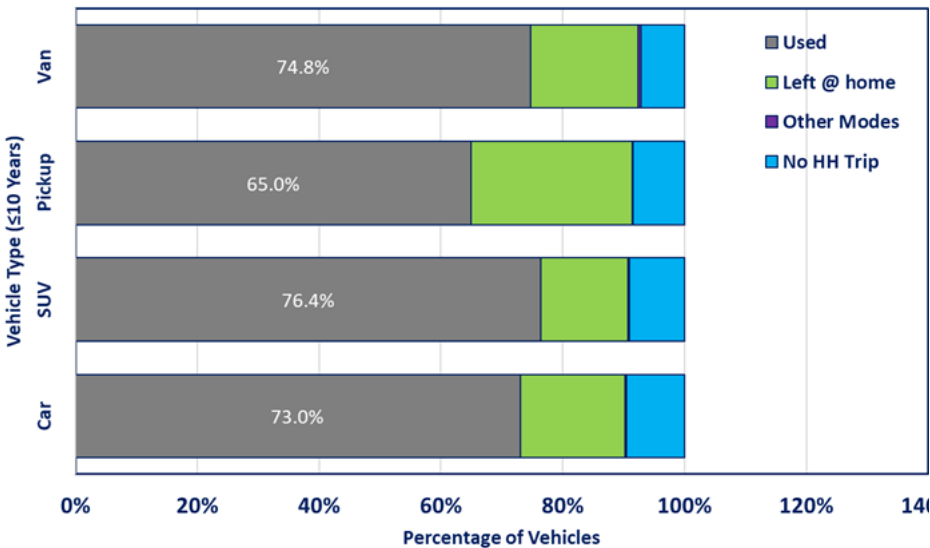
# NEWER VEHICLES ARE USED MUCH MORE, ESPECIALLY SUVs IN AN MSA.

- For any of the four vehicle types, usage rates within MSAs are higher than those outside MSAs
- People in MSAs tend to own more new cars than other vehicle types. Non-MSA areas do not show significant difference between ownership of cars and other vehicle types
- Cars, especially those  $\leq 10$  years in age, are the most-owned vehicle type, because of their much higher ownership rates in MSAs

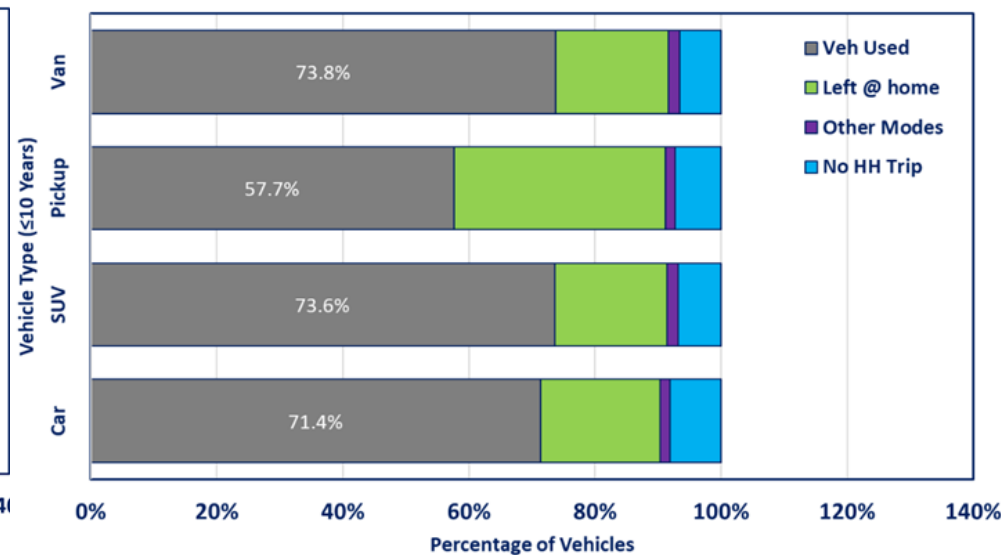


# SUVS AND VANS ARE THE MOST-USED VEHICLE

- Pickup trucks are most common as an extra vehicle; their everyday use is least probable
- Usage rate of all vehicle types are higher in 2017 comparing to 2009. Pickup has most significant increase in usage rate.
- Shares of “Used other Modes” decreased across all vehicle types



2017 NHTS



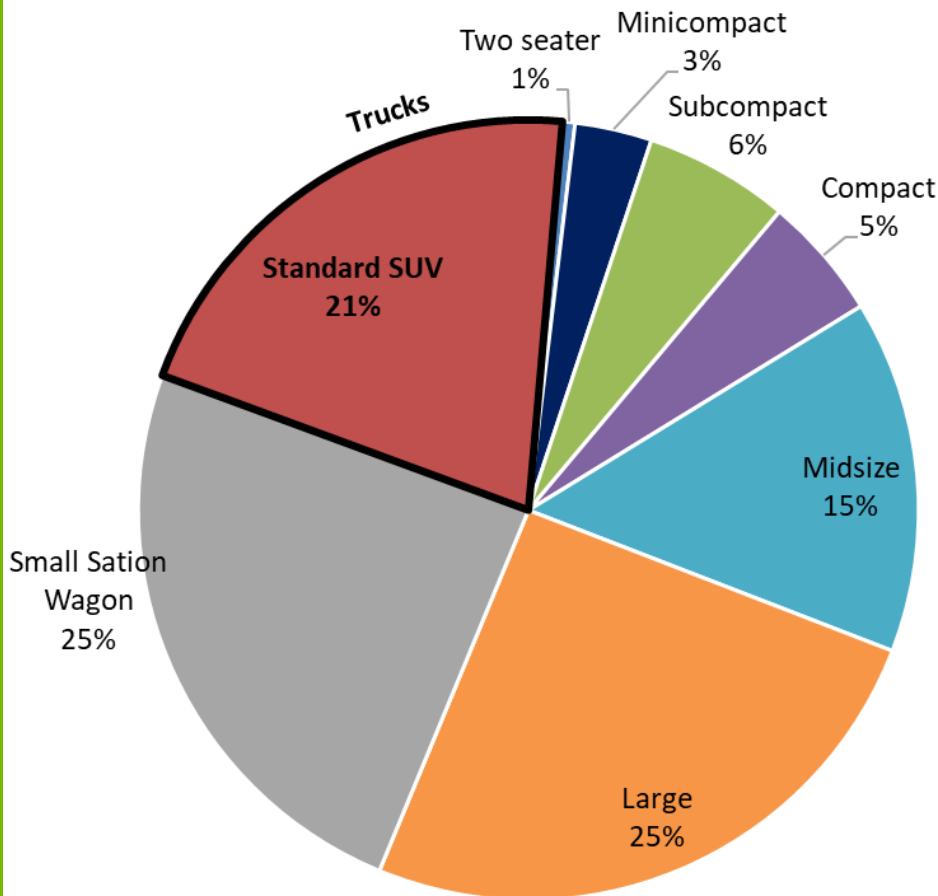
2009 NHTS



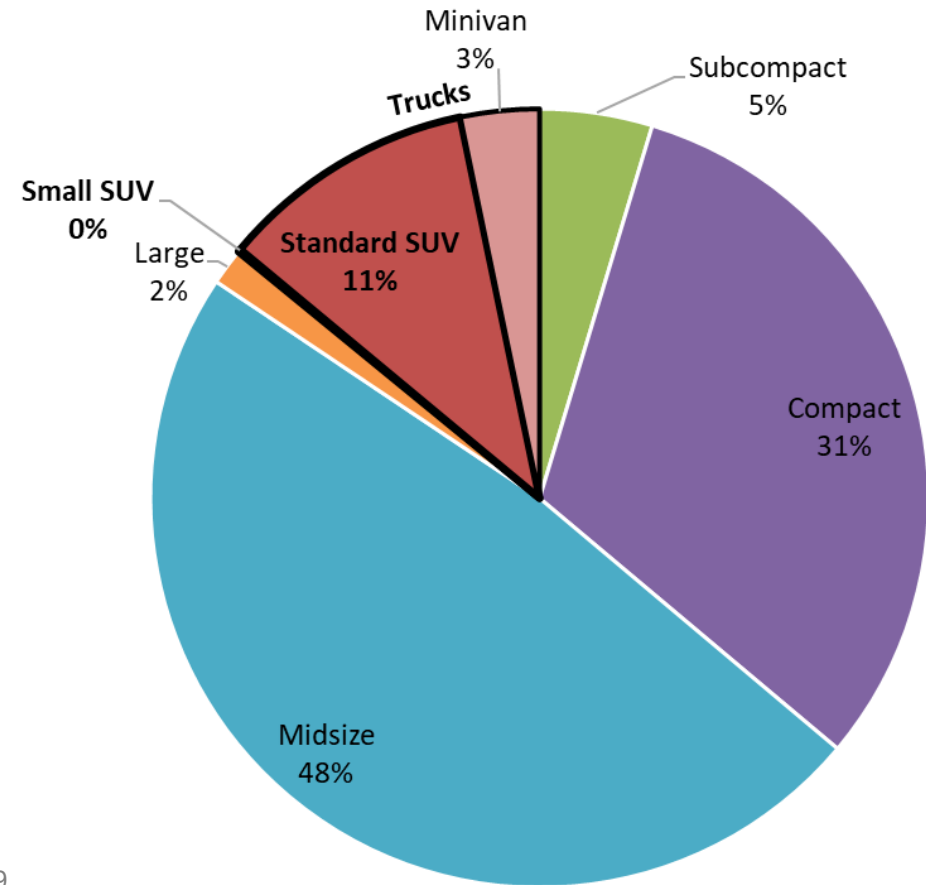
# SUV SHOULD BE THE SECOND BIGGEST POTENTIAL MARKET FOR PEVS, BESIDES CAR

Now there are several SUV models available in PEV markets, accounting for 21% and 11% of BEV and PHEV markets in 2017

2017 BEV Sales by Size

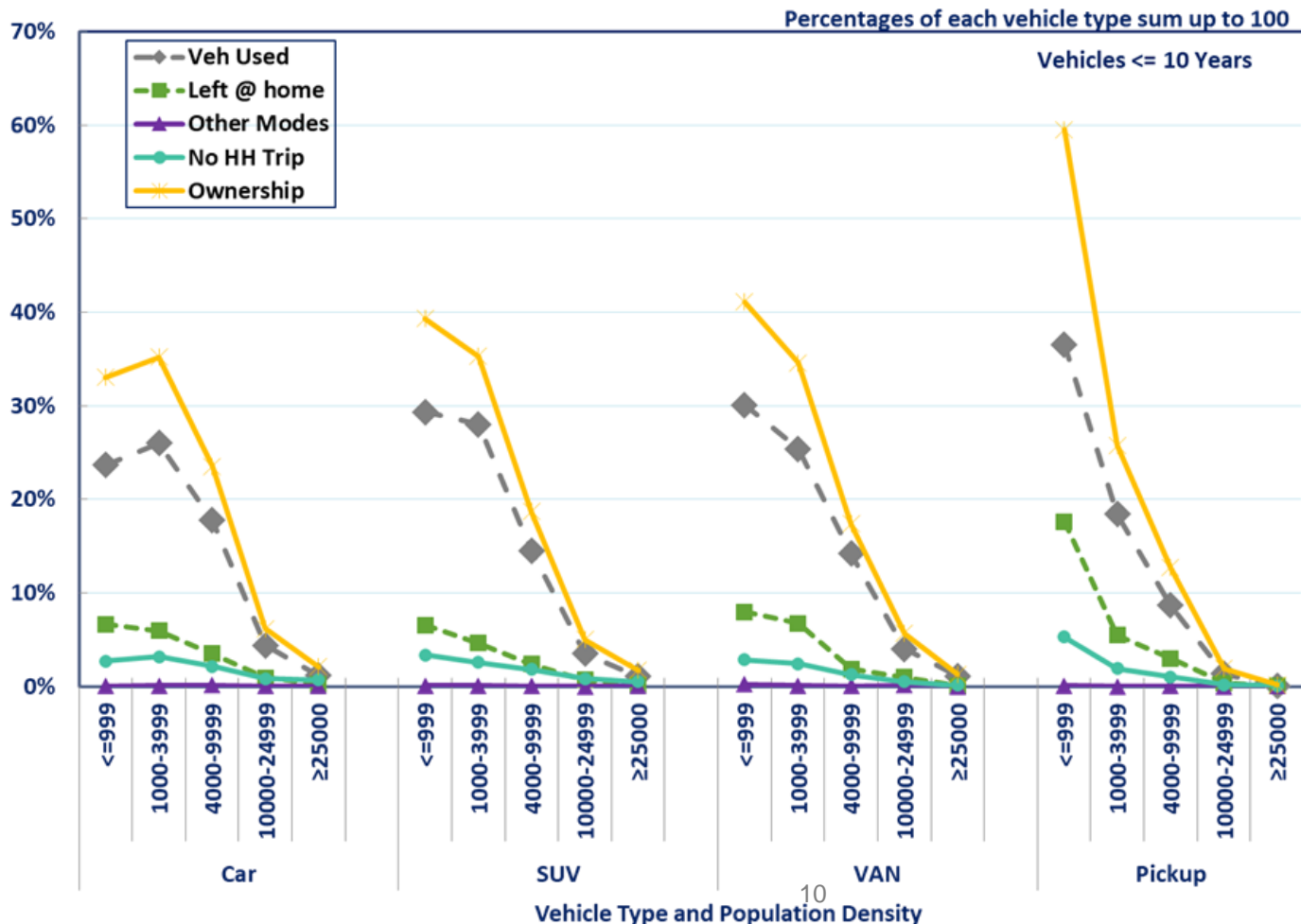


2017 PHEV Sales by Size



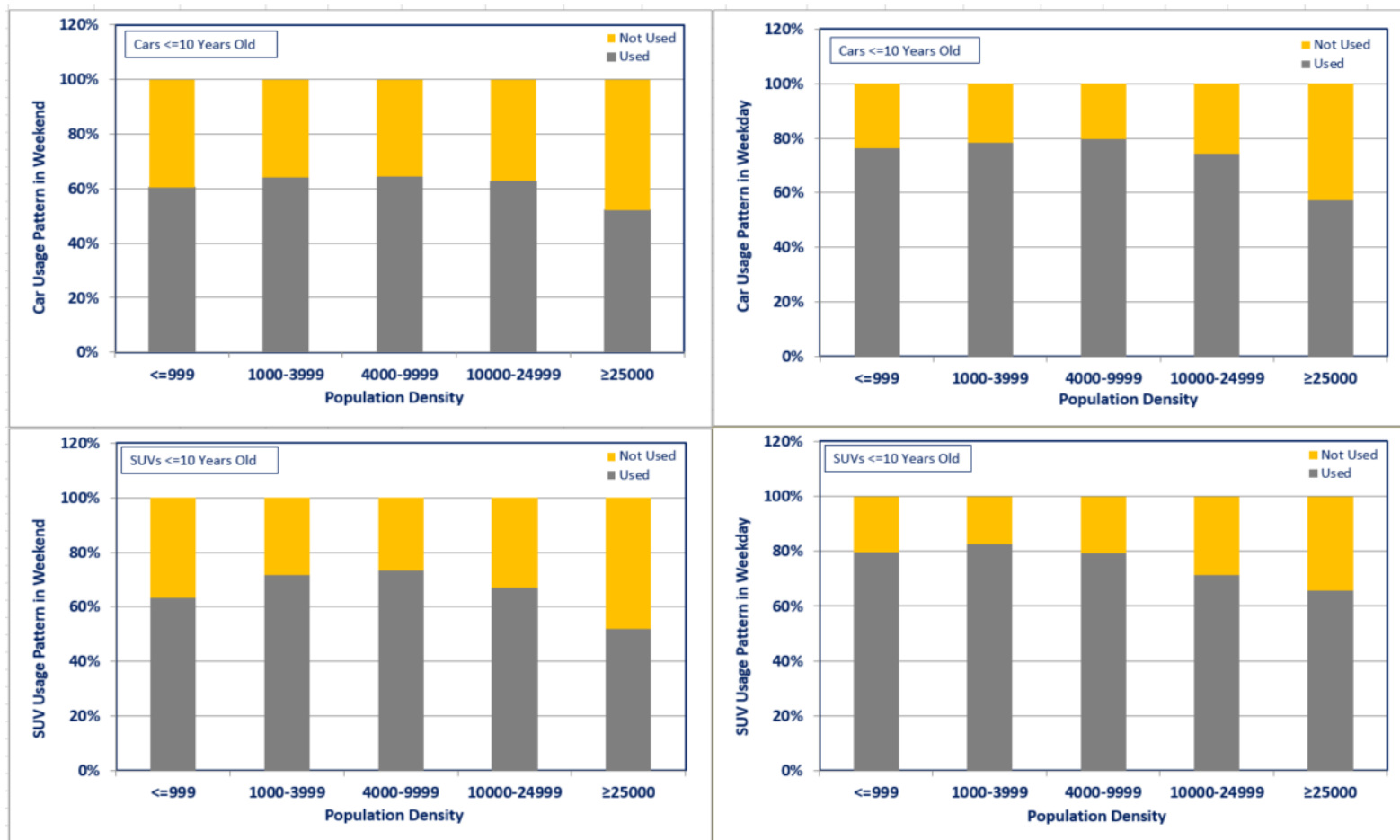
# THE USAGE RATE OF ALL VEHICLE TYPES DECREASES AS THE DENSITY INCREASES, AS DOES OWNERSHIP

- Pickup is the most frequently “Left @ home” in the lowest density areas



# MORE CARS WERE USED ON WEEKDAYS THAN WEEKENDS AMONG ALL OF THE POPULATION DENSITY GROUPS

- However, such difference reduces in two highest density categories. This is also true for SUVs, even for vehicles in the densest urban areas





# SUMMARY

- ❑ Overall vehicle usage increased in the 2017 NHTS, compared to the 2009 NHTS
- ❑ The main reasons for this increase are:
  - the usage rate of new vehicles increased more than that of older vehicles, especially cars,
  - % of vehicles “Left at home” and household members used “Other Modes” decreased sharply, especially in MSAs,
  - a sharp increase in pickup usage
- ❑ Vehicle not used because household members used “Other Modes” declined significantly from 2009 survey results, across all vehicles types in both MSA and Non-MSA
- ❑ Most vehicles, especially older ones, not used in the survey are “left at home” because household members own other vehicles
- ❑ Newer vehicles are used much more, especially SUVs in an MSA
- ❑ Usage rates within MSAs are higher than those outside MSAs
- ❑ Those who used “Other Modes” on the travel day have much higher probability of using taxi/ride share at different frequency level

**THANK YOU!  
QUESTIONS?**

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