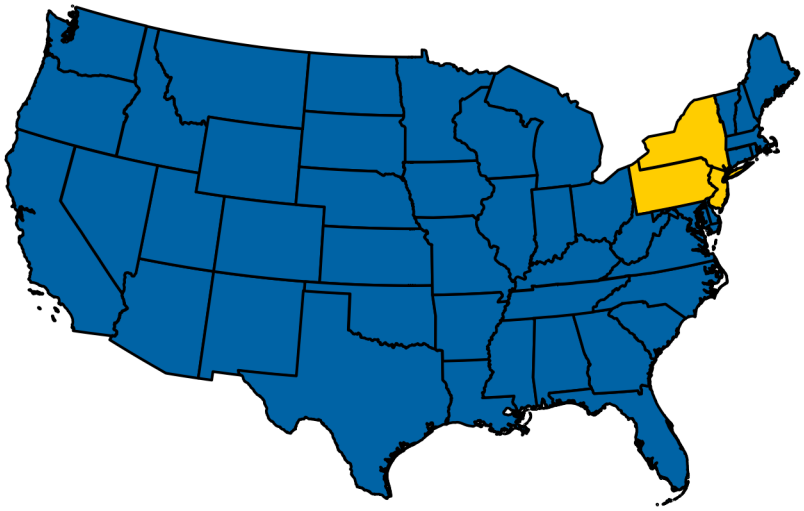


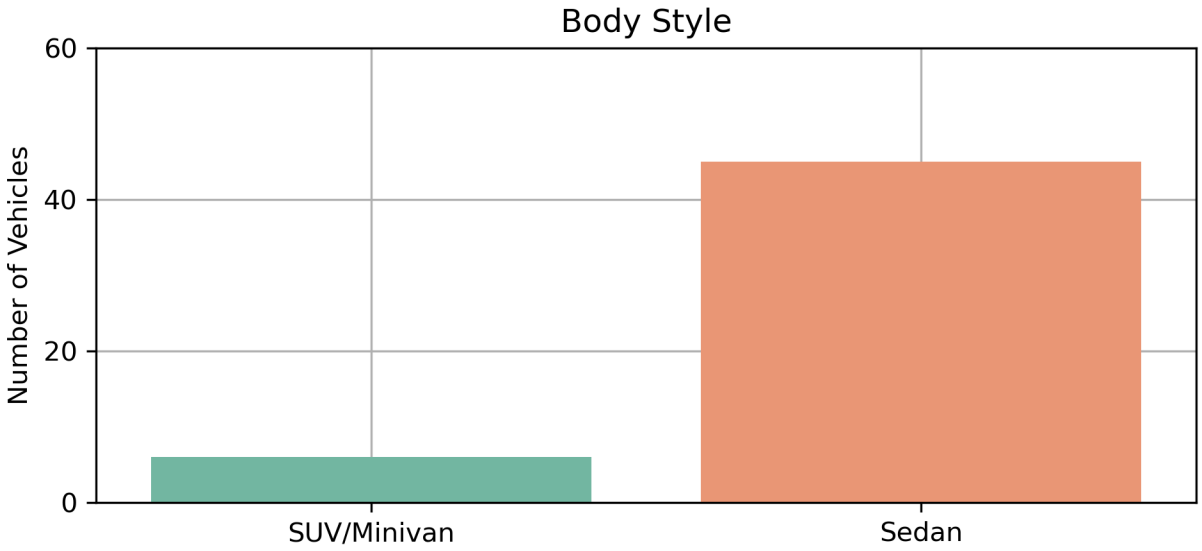
EV WATTS Regional Analysis

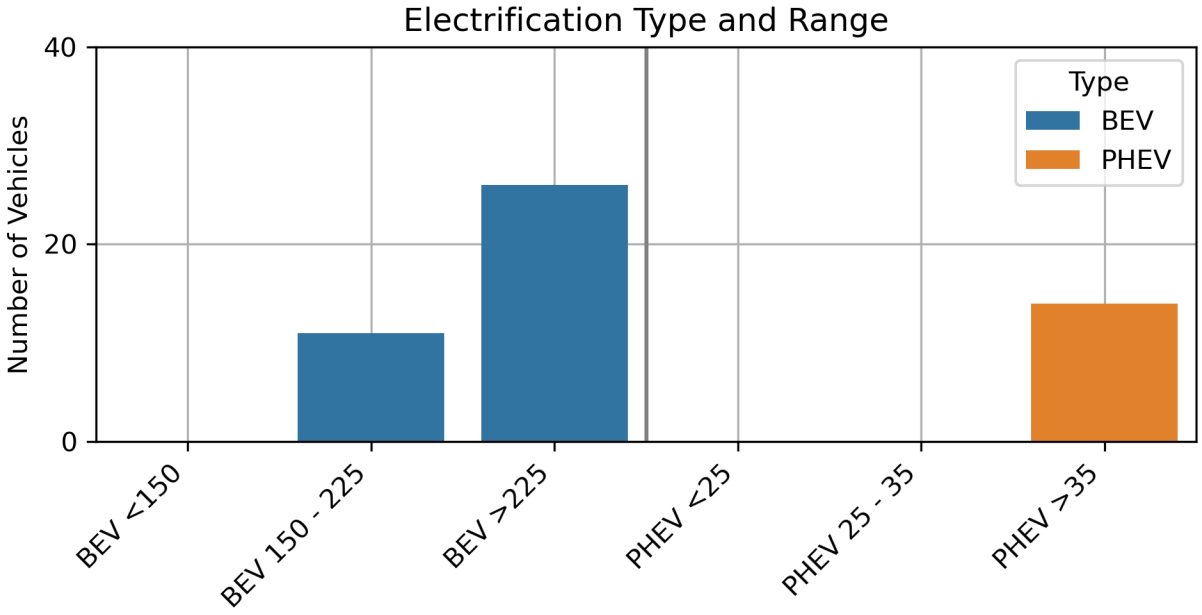
Fleet Vehicle Report: Middle Atlantic

This report provides a breakdown of regional statistics compared with the national Electric Vehicle Widescale Analysis for Tomorrow's Transportation Solutions (EV WATTS) dataset. EV WATTS addresses a growing need for practical information on vehicle electrification. The EV WATTS project team collects operations and charging data from telematics devices on electric vehicles with partners across the U.S. The project applies proven data collection and analysis methodologies to collect, validate, clean, anonymize, analyze, and summarize data from various electric vehicle (EV) technologies and applications. Analyzing this data helps better understand charging patterns and operational performance to inform the U.S. Department of Energy's research. For more information and to access an interactive interface that displays statistics and findings from the entire EV WATTS dataset visit www.evwatts.org.

Region Breakdown

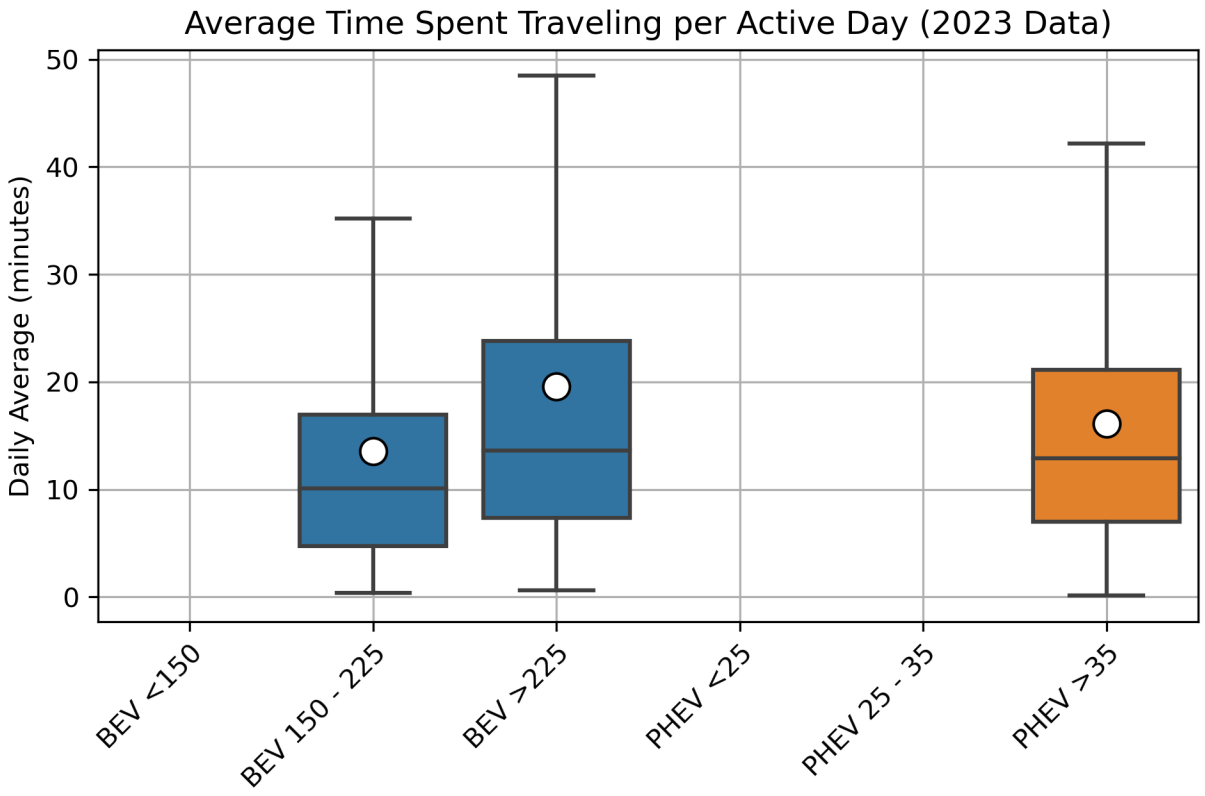
The following region breakdown categorizes each vehicle in the region by *Body Style* and *Electrification Type and Range (miles)*. This categorization provides an overview of region make-up, and serves to help differentiate between various types of region operations. For example, battery electric vehicles (BEV, which only uses electricity) may have different travel and charge time behaviors compared to plug-in hybrid electric vehicles (PHEV).


Body Style
Number of Vehicles
60
40
20
0
SUV/Minivan
Sedan


Electrification Type and Range
Number of Vehicles
40
20
0
Type
BEV
PHEV
BEV <150
BEV 150 - 225
BEV >225
PHEV <25
PHEV 25 - 35
PHEV >35

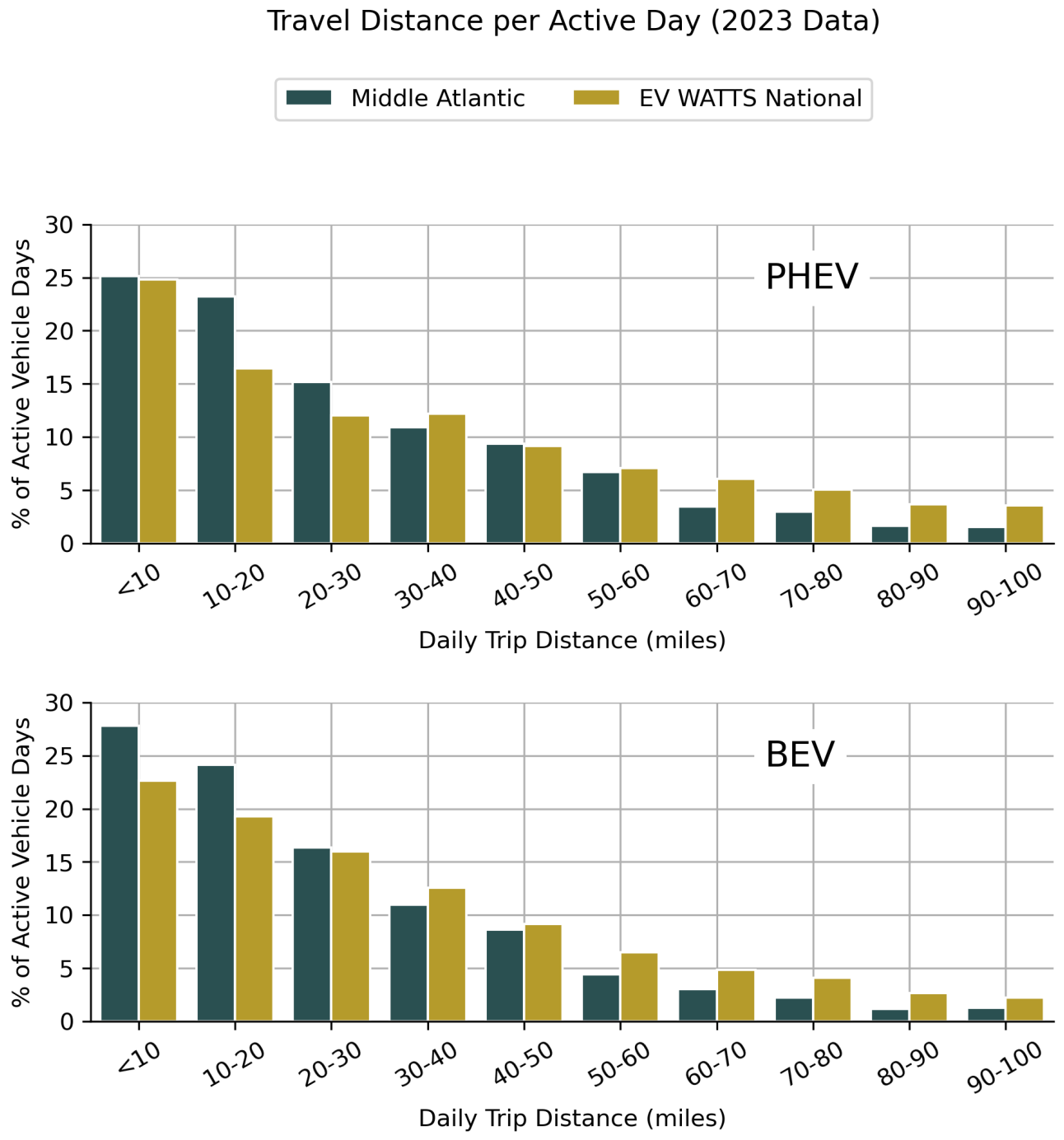
Travel Distances

The *Average Time Spent Traveling by Vehicle Type and Range* plot visually shows the distributions in duration of daily trips (minutes) between each electrification level for the region. The white dot represents the mean daily trip length for each electrification level. The mean is greater than the median (the line in the box) because the median is less impacted by outliers. PHEVs are typically driven longer than BEVs, based on the national EV WATTS data set. Some figures include only recent data as noted to show current trends in the results rather than all data collected since October 2019.

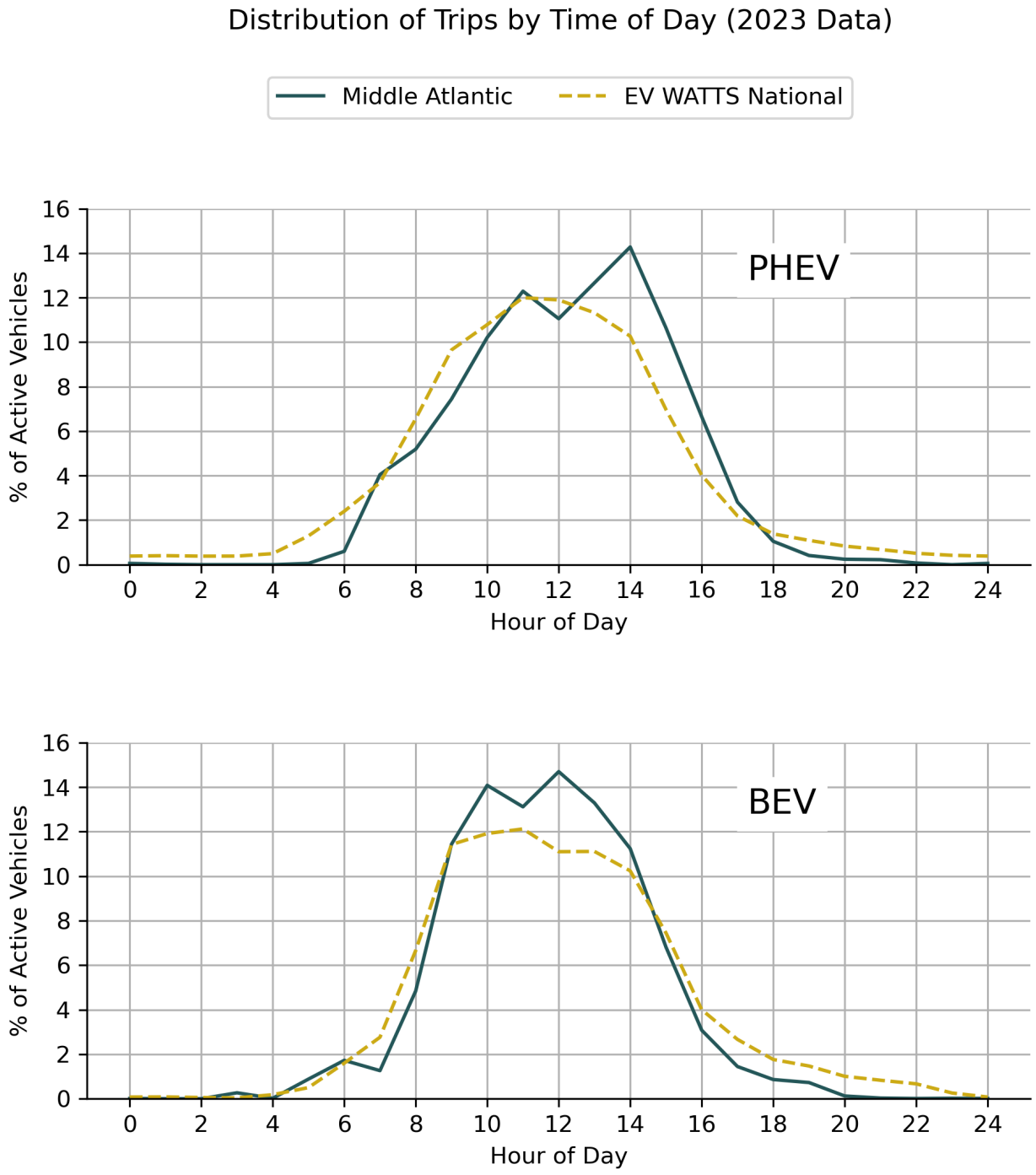


2023 Data	EV WATTS National Mean (minutes/day)	Middle Atlantic Mean (minutes/day)
BEV	16.3	15.9
PHEV	17.9	16.1
Combined	16.9	16.0

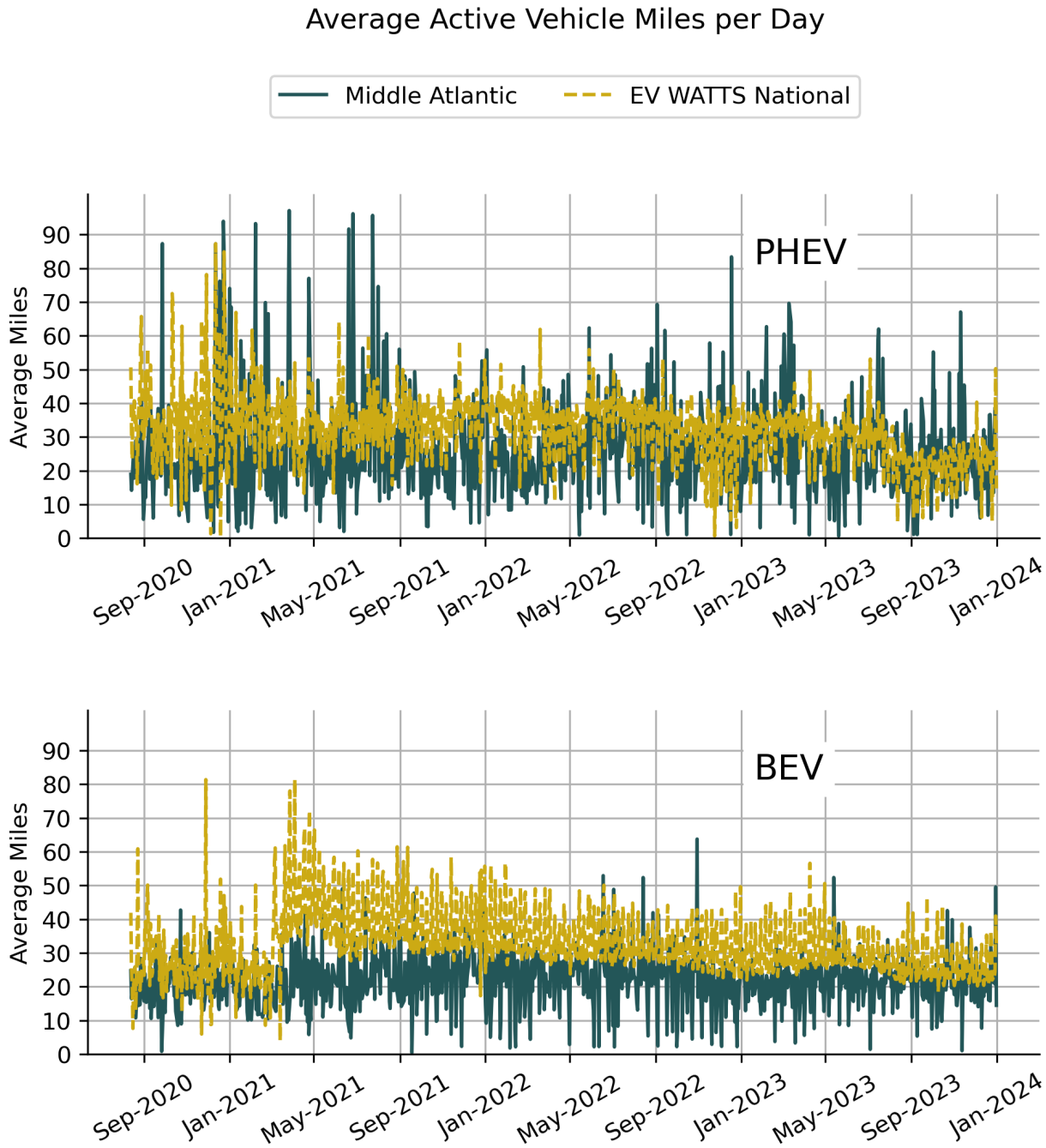
The distribution of *Travel Distance per Day* is calculated using each vehicles' active days. Active days are days in which the vehicle is being driven.



The *Distribution of Trips by Time of Day* helps visually understand when vehicles are actively used. The EV WATTS national distribution of trips by time of day, indicates that most vehicles are used between 8am and 4pm.

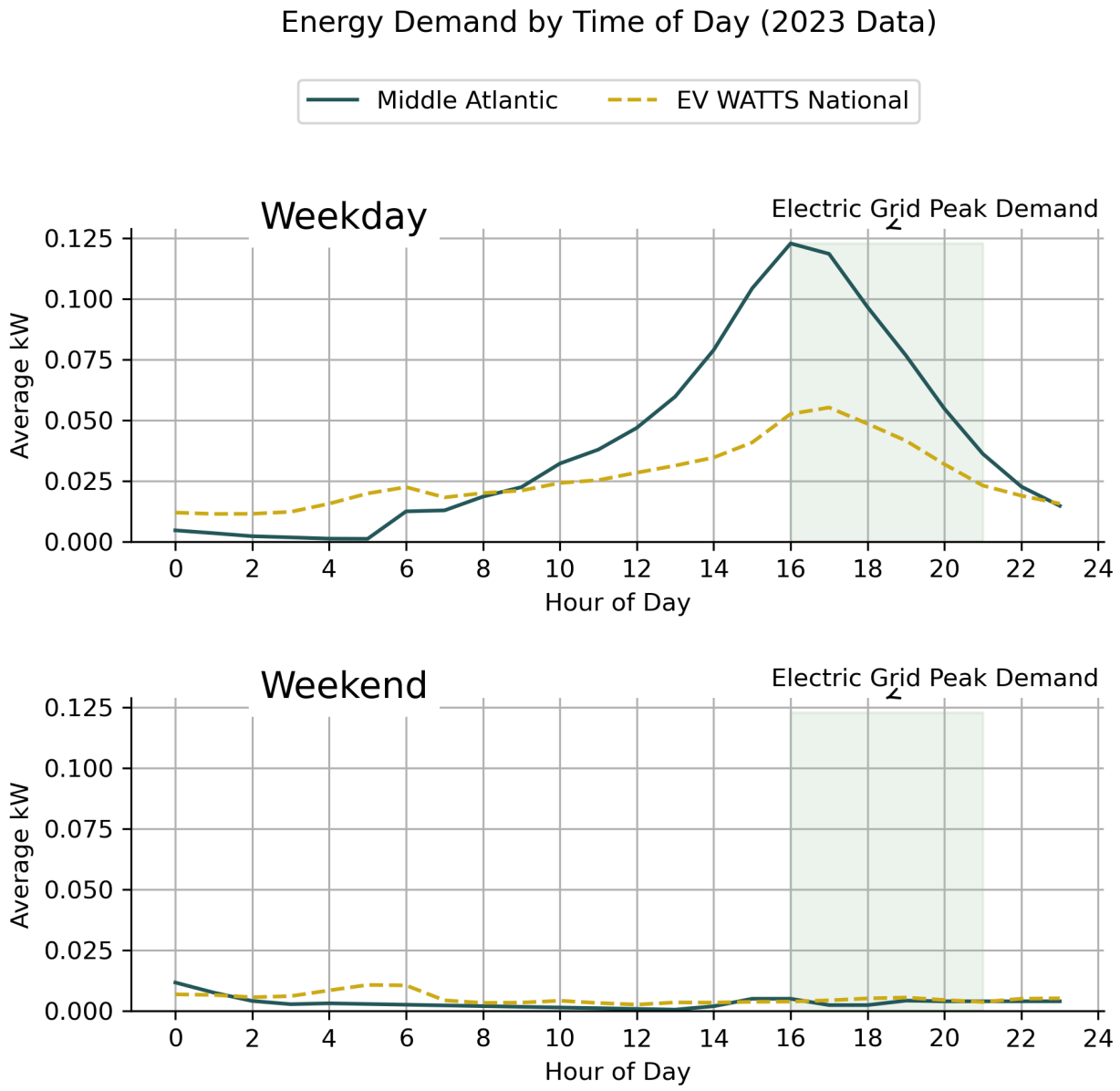


Average Active Vehicle Miles per Day over time is calculated by excluding days with zero miles driven. The plots focus on the trend between 0 and 100 active vehicle miles per day. While some regions occasionally have a few days when the average mileage is higher than this, it is rare and were not shown below. This trend helps analyze regional vehicle usage, particularly between PHEVs and BEVs when the region includes both technologies.



Energy

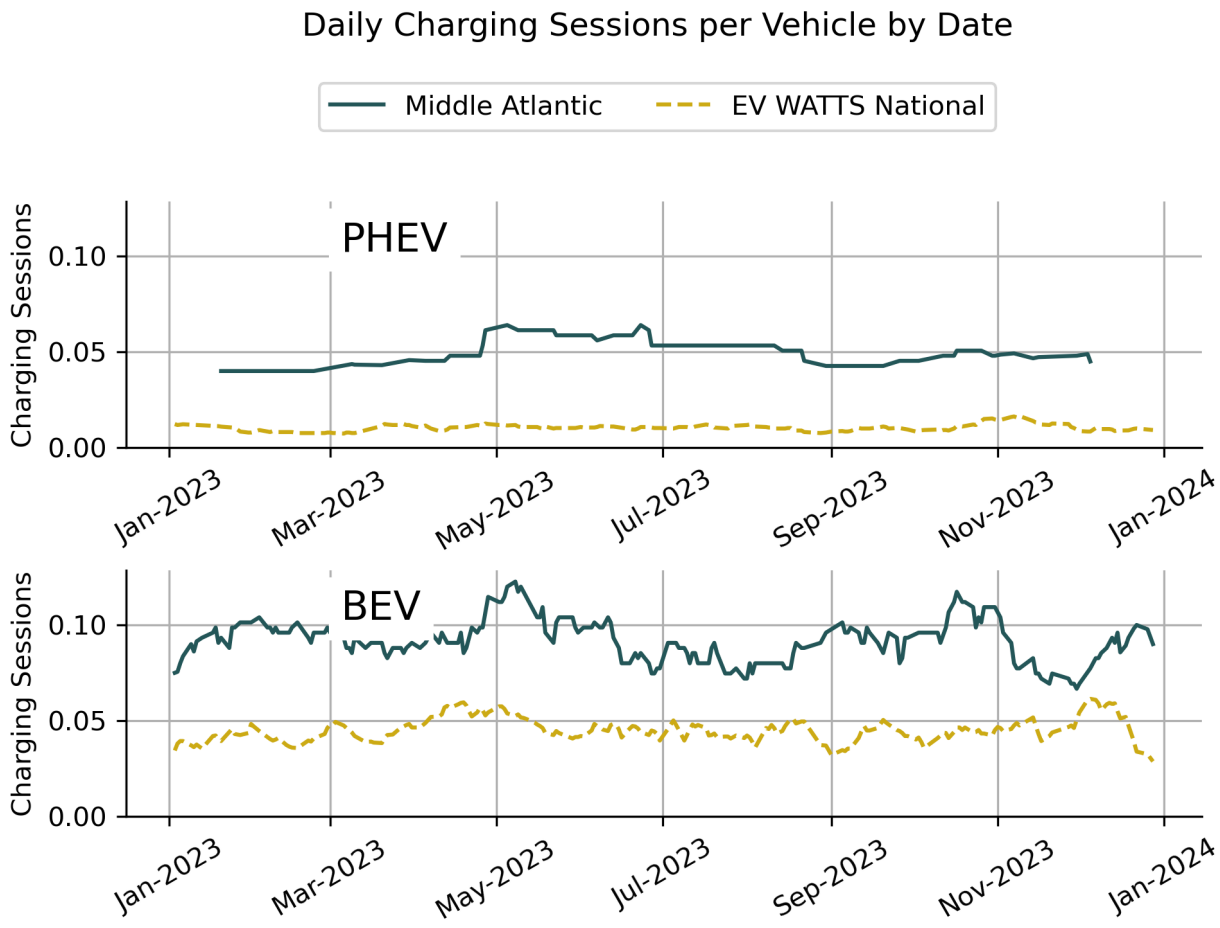
Energy demand in kilowatts (kW) accounts for charging across all EVs in the region. Energy demand is calculated by averaging the total energy consumption over the length of every charging session, rounded to the nearest hour. Charging at peak hours (4pm - 9pm) is generally more expensive, represented by the shaded region in the graph below.



Charging

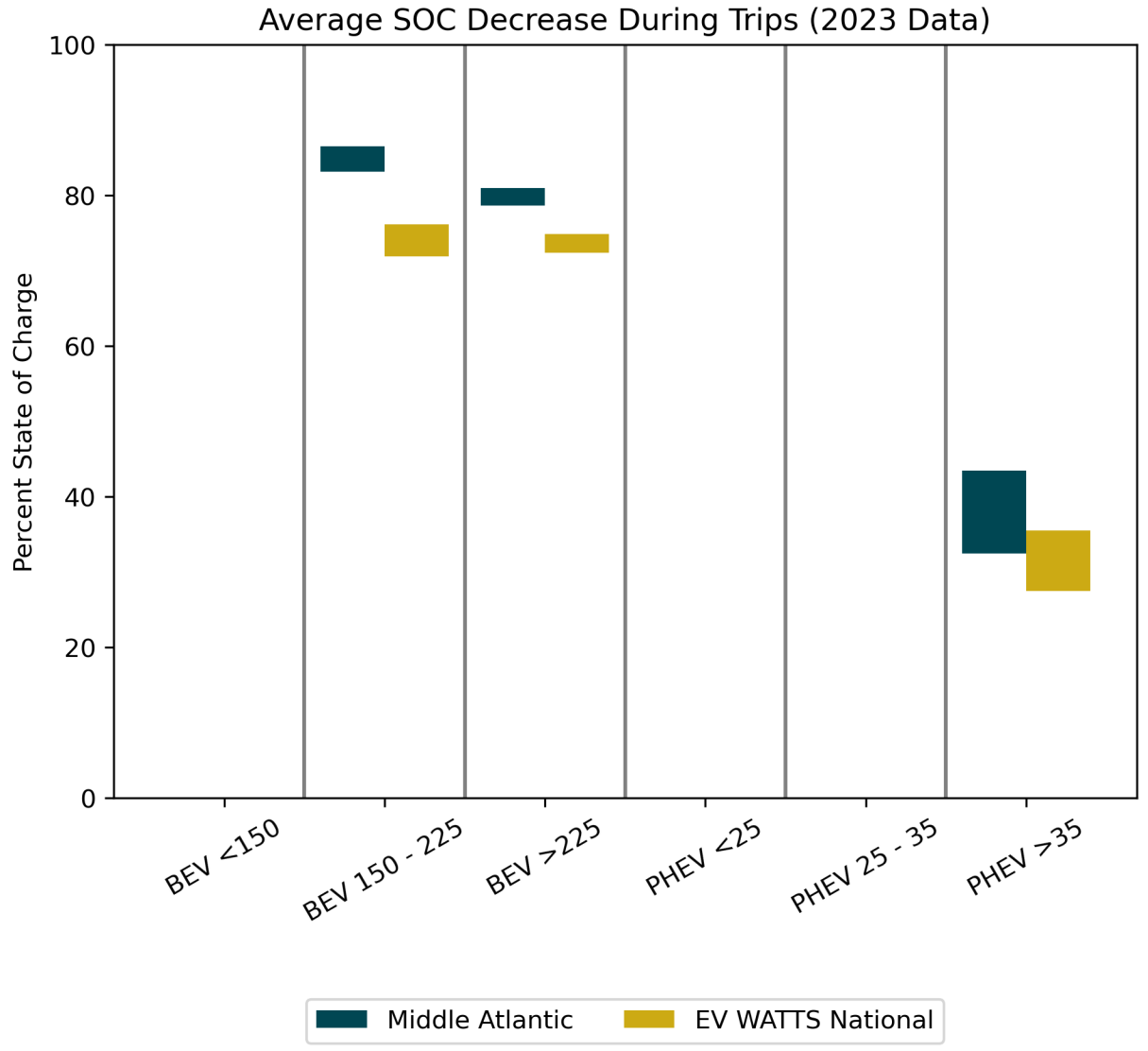
The *Daily Charging Sessions per Vehicle by Date* sums the average number of charging sessions by day for each region.

Data Set	Median Charging Duration (hours)
EV WATTS National	2.1
Middle Atlantic	2.2

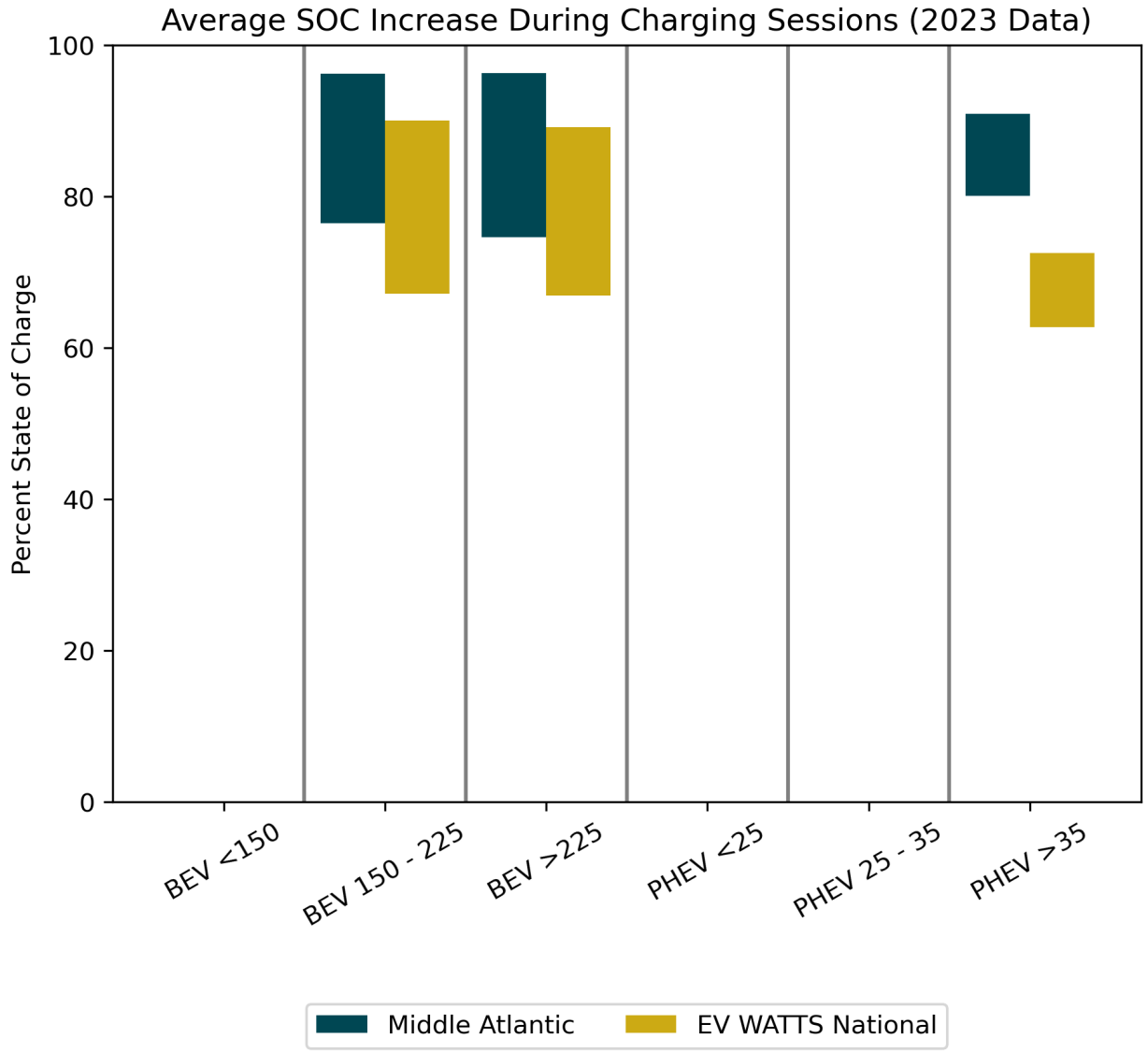


Data Set: Middle Atlantic	Number of Sessions	Number of Trips	Number of Vehicles
BEV	505	9,895	37
PHEV	89	5,124	14
Total	594	15,019	51

The *Average State of Charge During Trips* distribution shows the average change in state of charge (SOC) during a trip (key-on to key-off, not necessarily a roundtrip from base location and back). The top of the box indicates the average SOC of vehicles of each electrification type at the beginning of a trip, and the bottom of the box indicates the average SOC at the end of a trip. Based on the EV WATTS National data set, BEVs have higher SOC levels at the end of a trip compared to PHEVs.
NOTE: The lower SOC levels for PHEVs indicate they are not being utilized to their full potential (being charged as often as possible).



The *Average State-of Charge During Charging Sessions* distribution shows the average change in SOC during a charging session. The bottom of the box indicates the average SOC at the beginning of a session, and the top of the box indicates the average SOC at the end of a session.



BEV Efficiency and Temperature

Temperature is one factor that affects electric vehicle performance. The *Effect of Temperature on Energy Use* shows average BEV watt-hours per mile which can be variable at high or low temperatures due to more limited data points.