

Diversity Patterns and Coincidence of EV Charging with Utility System Loads

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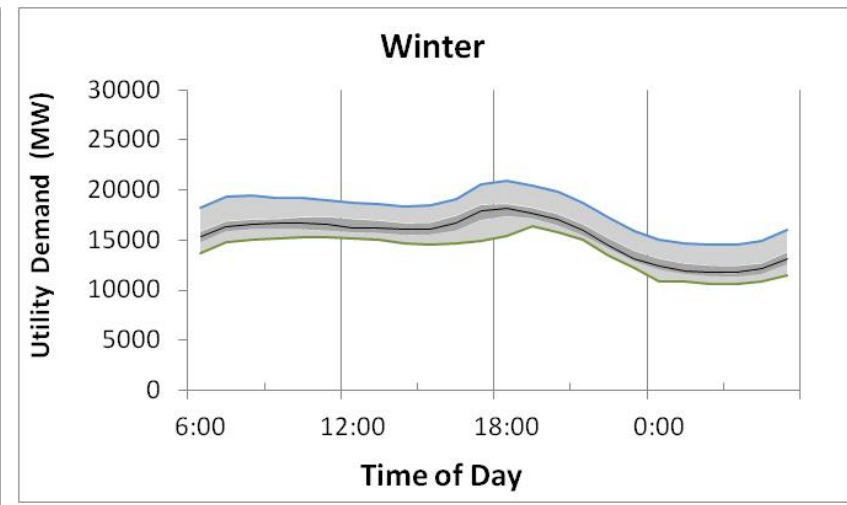
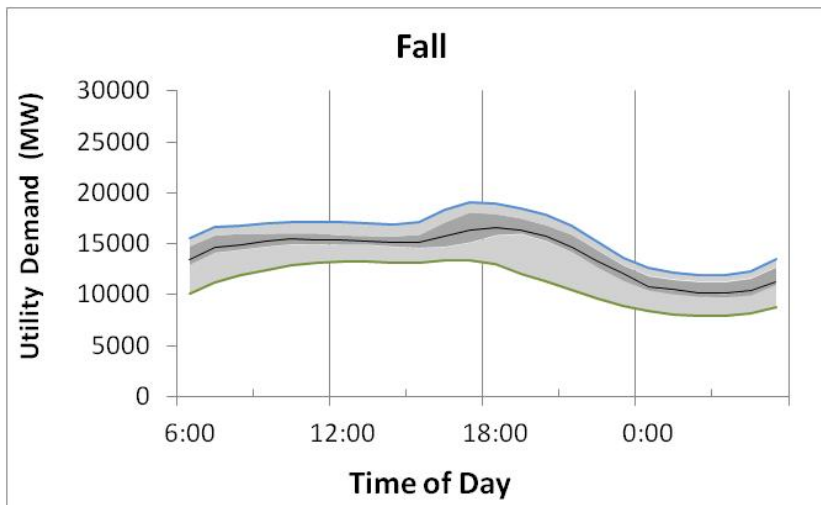
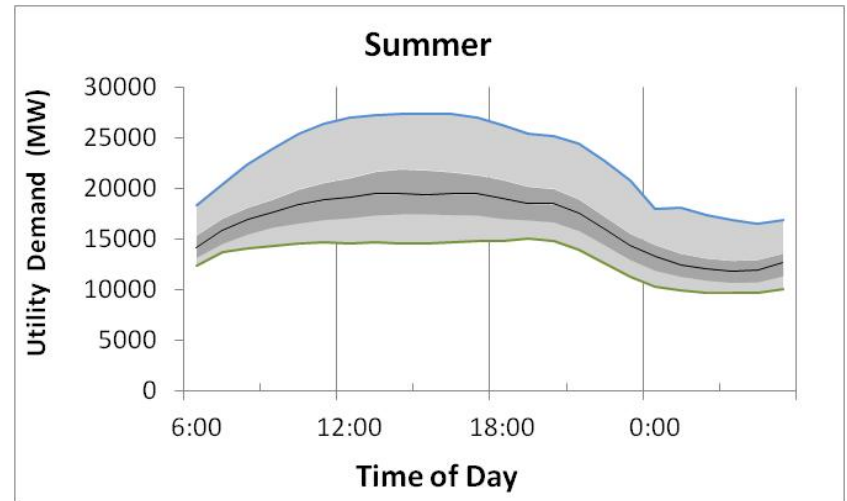
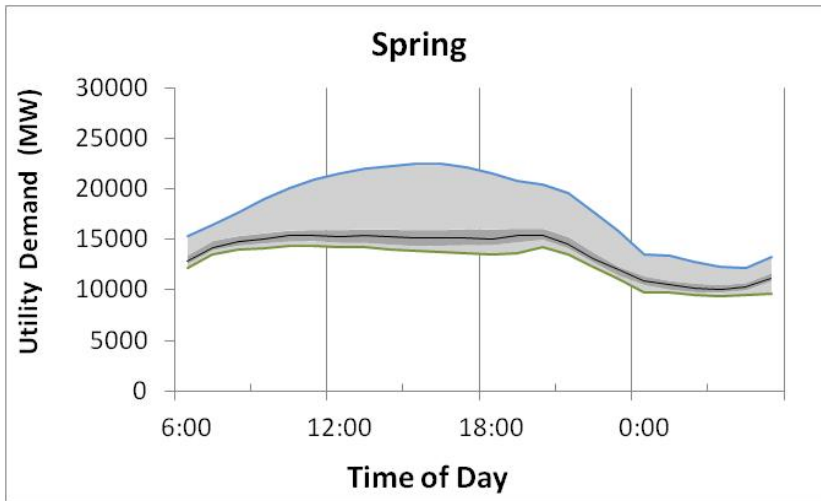
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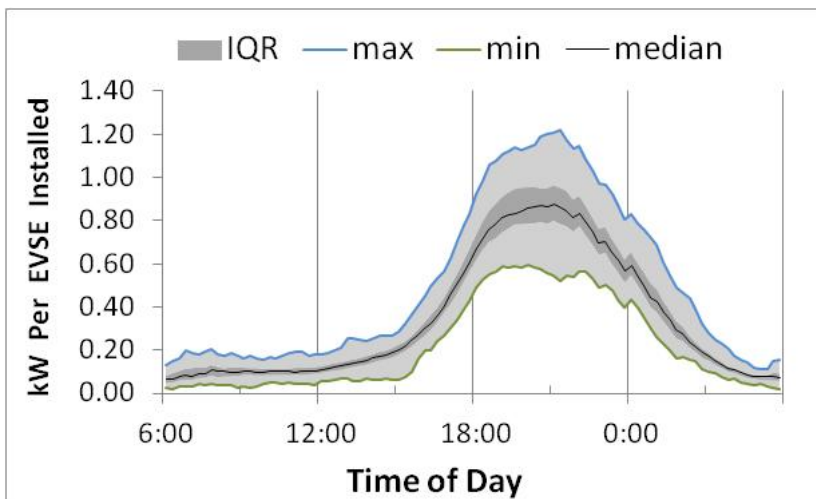
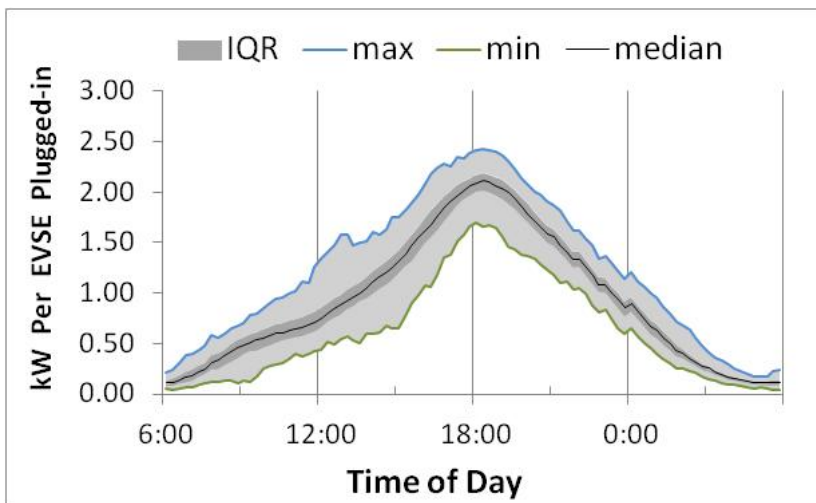
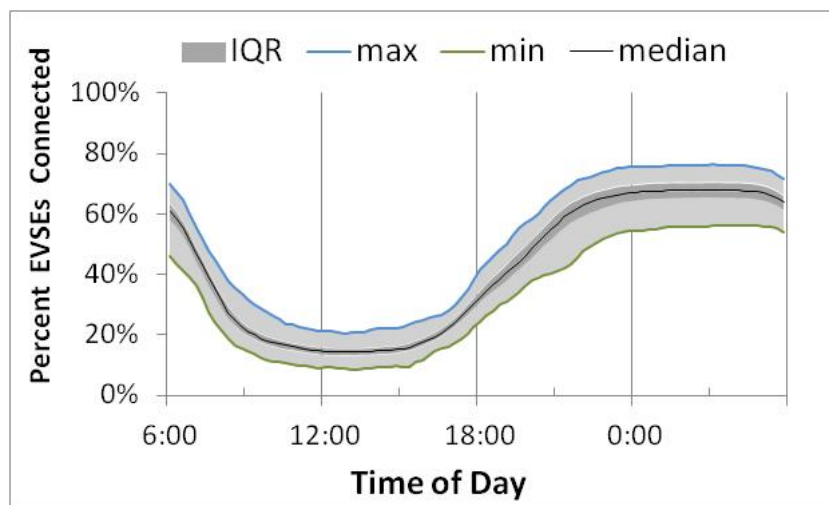
ISO New England 2013 Load Profile on Regular Week Days



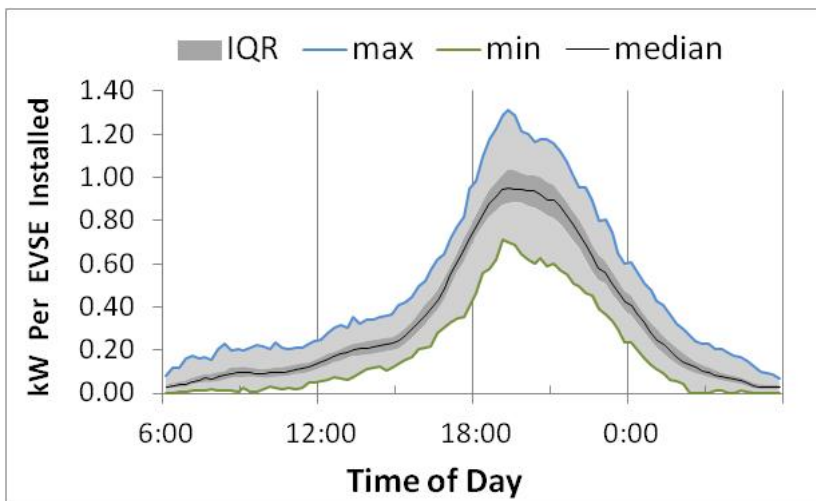
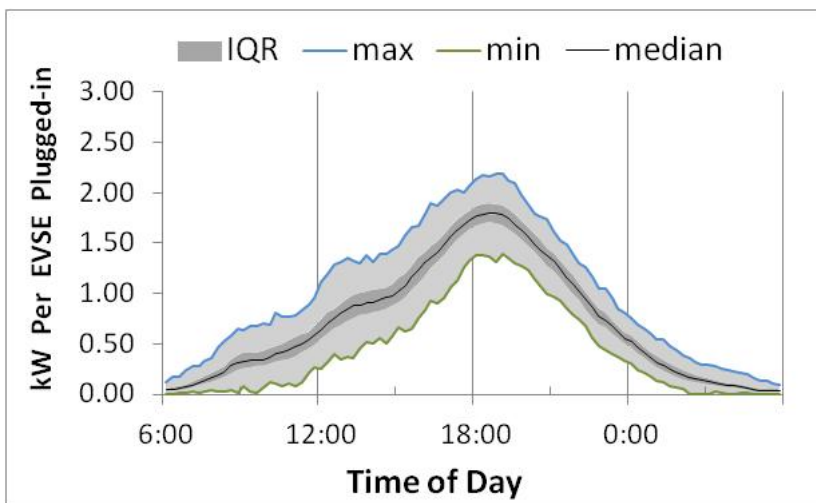
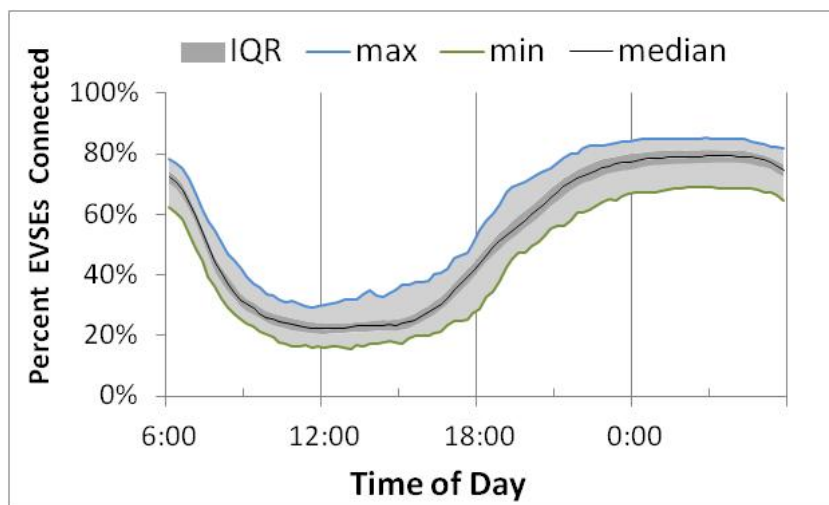
Data used to create EV Charging Demand Profiles

- All vehicle charging consisted of level 2, 3.3 kW charging from Nissan Leafs and Chevrolet Volts.
- All charging occurred at the vehicle owners home.
- EV charging in areas with out time of use rates were selected for this analysis.
 - Seattle
 - Tennessee
 - Dallas / Fort Worth
- All demand profiles were created from vehicle charging on regular week days.
 - A regular week day is a week day that is not a holiday.

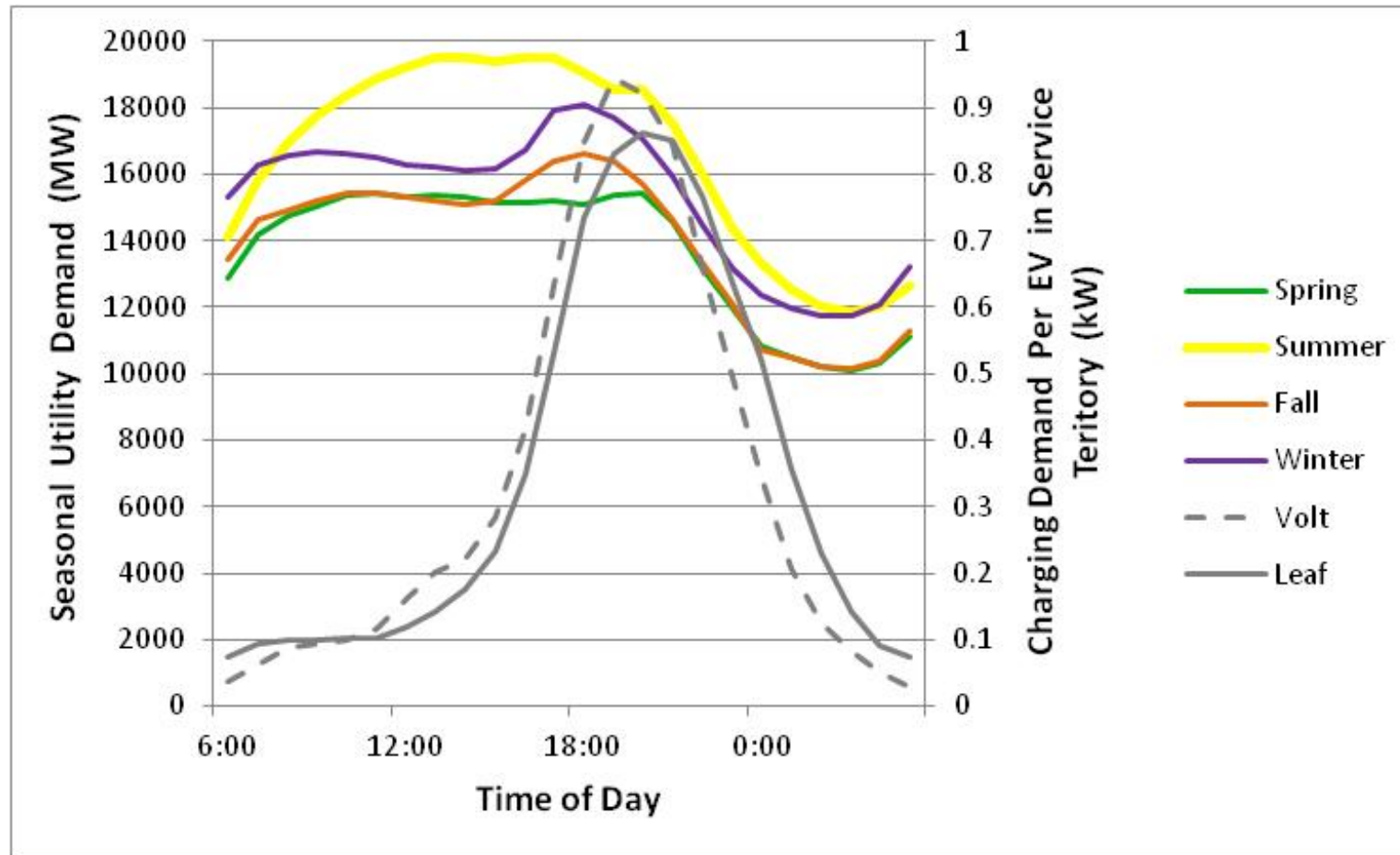
Nissan Leaf Charging Profiles in areas with no time of use rates on Regular Week Days



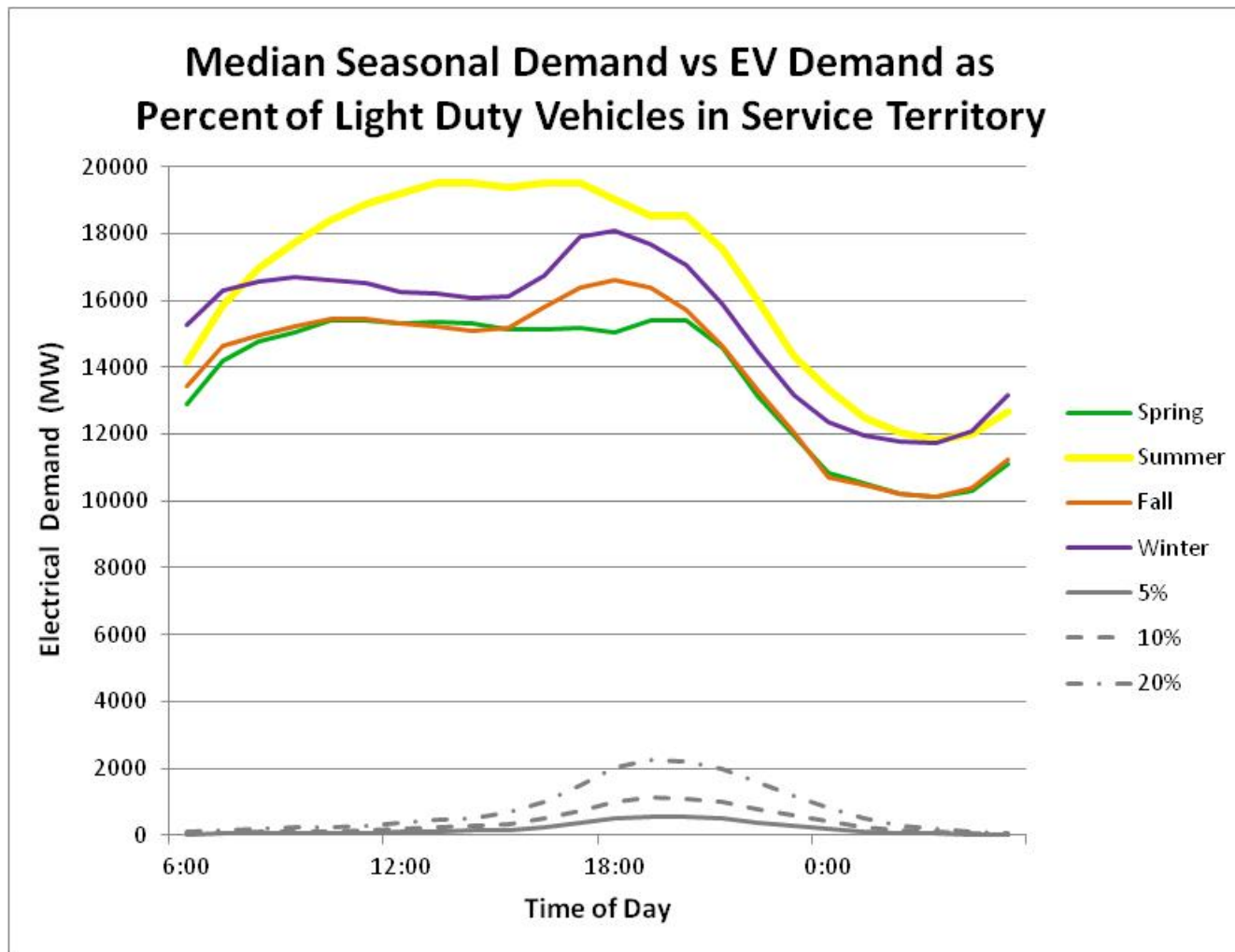
Chevrolet Volt Charging Profiles in areas with no time of use rates on Regular Week Days



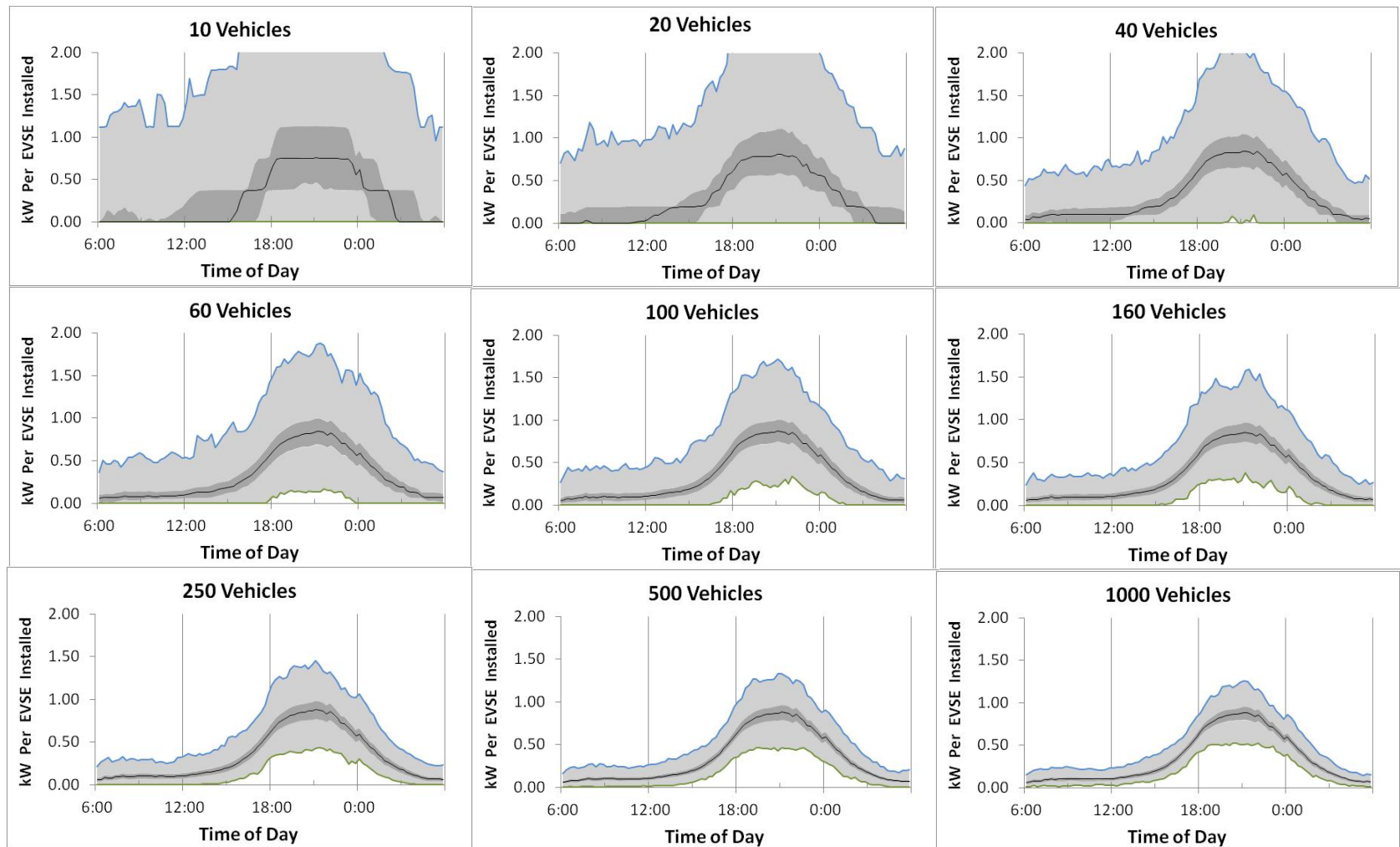
ISO New England Median Seasonal Demand in 2013 vs. Hypothetical EV Charging Demand



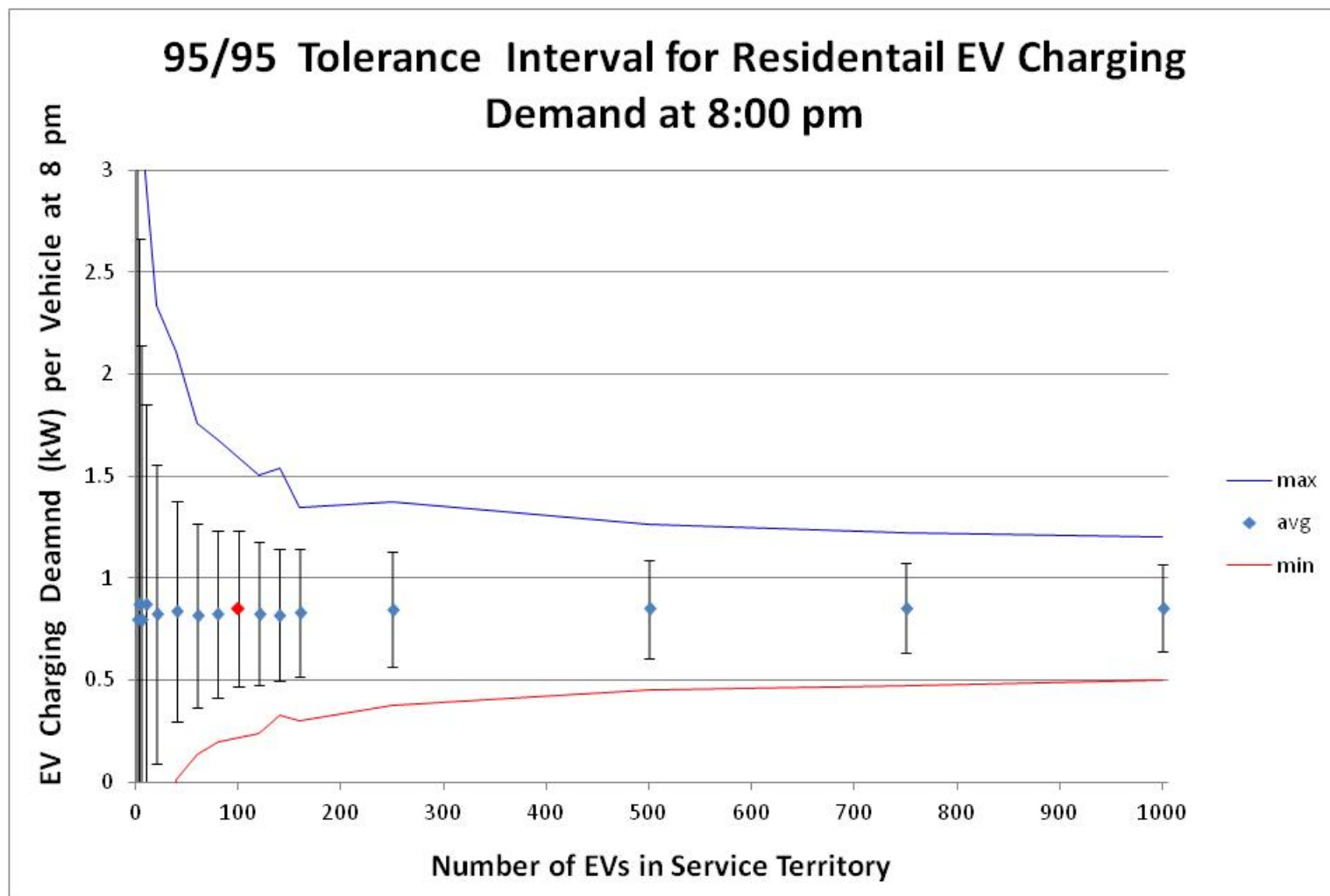
ISO New England Median Seasonal Demand in 2013 vs. Hypothetical EV Charging Demand



Variability in Residential EV Charging Demand as the Number of EVs that are Charging Increases



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Next Steps

- Investigate the impact on the aggregate EV charging demand when there are vehicles that charge at a variety of charge rates.
 - 1.4 kW charging
 - 3.3 kW charging
 - 6.6 kW charging
- Investigate the impact of time of use rates on aggregate EV charging demand.

