VERMONT
AGENCY OF TRANSPORTATION
RESEARCH PROGRAM

Evaluation of Battery Electric Vehicle Performance in Mountainous Regions and Cold Climates

STUDY TIMELINE
Aug 2022 – May 2027

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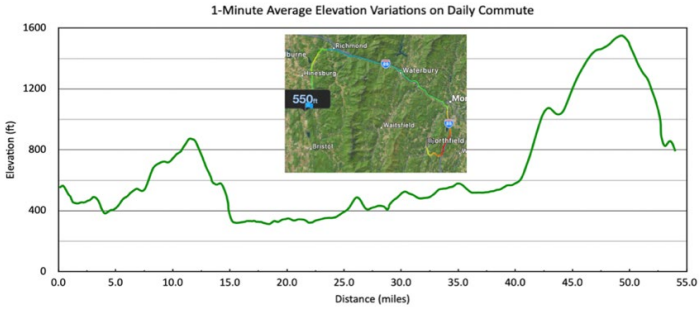
More information about the Agency of Transportation Research Program, including additional Fact Sheets, can be found at: http://vtrans.vermont.gov/planning/research

Introduction

Researchers from Norwich University (NU) are investigating the impact that climate, terrain, varying road conditions, and road classification have on the overall performance (range/energy consumption) of battery electric vehicles (BEVs). The impact that these challenging conditions have on vehicle safety systems and sensors required for semi/full automated vehicle operation may also be investigated.



Project Methodology

This research project involves operating a Tesla Model Y Long Range AWD in Vermont to collect data on vehicle performance (energy consumption in Wh/mi) while considering ambient temperature, elevation gain, and vehicle speed. The performance of ADAS in environments that challenge the efficacy of these systems, including poorly marked rural roads and roads and markings covered with snow, will also be monitored.

Conclusions/Next Steps

The real-world range of BEVs will have a direct impact on the charging infrastructure required to provide energy for/to BEVs, and the results from this study could be used in future efforts to optimize vehicle charger distribution, especially in rural communities.

Impacts and Benefits

Results from this project can guide VTAOT in terms of charging infrastructure required to satisfy NEVI and potential changes/improvements to road markings to accommodate the implementation of autonomous vehicles in the state.