

## **The Virginia Connected Corridor 50 Elite Vehicle Naturalistic Driving Study (VCC50 Elite NDS) (00-029) Dataset**

Dataset available at: <https://doi.org/10.15787/VTT1/98NBN7>

(This dataset supports report **Real-World Use of Automated Driving Systems and their Safety Consequences: A Naturalistic Driving Data Analysis**)

This U.S. Department of Transportation-funded dataset is preserved by the Virginia Tech Transportation Institute (VTTI) in their data repository (<https://dataverse.vtti.vt.edu/>), and is available at <https://doi.org/10.15787/VTT1/98NBN7>

The related final report **Real-World Use of Automated Driving Systems and their Safety Consequences: A Naturalistic Driving Data Analysis**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/58336>

### **Metadata from the VTTI Repository record:**

#### Description:

- **Project Description:** Automated driving systems (ADS) have the potential to fundamentally transform transportation by reducing crashes, congestion, and cost while improving traffic efficiency and access to mobility for the transportation-challenged population. However, people may not use ADS as intended due to their misunderstanding of such systems' capabilities and limitations. Recent news articles, reporting Tesla drivers napping behind the wheel, suggest the need for a better understanding of how people are using ADS as well as what benefits and consequence that such systems have on transportation safety. Therefore, this work aims to investigate the (1) real-world use of automated longitudinal and lateral control features (e.g., adaptive cruise control and lane keeping assistance), (2) capabilities and limitations of such systems found in real-world operation, as well as (3) safety benefits and unintended consequences of these technologies. For this purpose, this study will leverage data collected from 50 participants who drove personally owned vehicles equipped with ADS for 12 months. The work is expected to contribute to a greater understanding of the prevalence and safety consequences of ADS use on public roadways, as well as drivers' perception of the early production ADS. The findings from this project may further inform the development of human-machine interfaces, training programs, and owners' manuals to reduce unintended use of ADS and negative consequences. The identified characteristics of the situations when the driving automation requested human drivers' intervention or failed without alerts will further inform the development of testing scenarios to ensure ADS safety.
- **Data Scope:** To evaluate the real-world driver interaction with commercially available longitudinal and lateral control features, the research team investigated an existing naturalistic driving database collected from the Virginia Connected Corridor 50 Elite Vehicle Naturalistic Driving Study (VCC50 Elite NDS). The VCC50 Elite dataset contains data from 50 drivers of vehicles with longitudinal control systems (ACC) at a minimum, although most also had lateral control systems. The participants were adult drivers aged 24 to 76 who were recruited and primarily commuted in the Washington, DC metro area which includes northern Virginia and sections of Maryland for 12 months (estimated 684,931 miles driven across all participants). The personal vehicles of the 50

participants were instrumented with VTTI-designed data acquisition systems. The available NDS data support the simultaneous investigation of the driver, vehicle, and environmental factors pertaining to driving automation system operation across a wide range of drivers in various situations. This dataset captured 223 safety critical events (SCEs including crashes or near-crashes) which have been manually coded by the VTTI's data reduction team.

- **Data Specification:** Data was collected from the Virginia Connected Corridor 50 Elite Vehicle Naturalistic Driving Study (VCC50 Elite NDS). The data acquisition systems continuously recorded vehicular data including GPS coordinates, speed, acceleration, and video streams of the forward roadway, the driver's face, an over-the-shoulder view of the driver's hands and lap area, a view of the footwell, and instrumented cluster.

**Subject:**

Engineering

**Keyword:**

Automated Driving, Level 1, Level 2, ADS

**Recommended citation:**

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**Dataset description:**

This dataset contains 1 .zip file collection below.

**The Virginia Connected Corridor 50 Elite Vehicle Naturalistic Driving Study.zip:**

The .zip file collection contains 4 .xlsx files described below.

- VCC\_SCE\_Feature\_Use\_v3.xlsx
- VCC\_SCE\_Feature\_Use\_data\_dictionary.xlsx
- baseline\_reduction\_v3.xlsx
- baseline\_reduction\_data\_dictionary.xlsx

The .xlsx file is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.

**National Transportation Library (NTL) Curation Note:**

As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (<https://doi.org/10.21949/1503647>) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at <https://doi.org/10.15787/VTT1/98NBN7> on 2021-12-01. If, in the future, you have trouble accessing this dataset at the host repository, please email [NTLDataCurator@dot.gov](mailto:NTLDataCurator@dot.gov) describing your problem. NTL staff will do its best to assist you at that time.