PTV VISSIM simulation data for efficient eco-ramp control project funded by NCST 18-19 Dataset

Dataset available at: https://doi.org/10.6086/D10M3D

(This dataset supports report **Development of Eco-Friendly Ramp Control for Connected and Automated Electric Vehicles,** https://doi.org/10.7922/G23F4MWB**)**

This U.S. Department of Transportation-funded dataset is preserved by the University of California, Riverside in the digital repository Dryad (https://datadryad.org), and is available at https://doi.org/10.6086/D10M3D.

The related final report **Development of Eco-Friendly Ramp Control for Connected and Automated Electric Vehicles**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/54763.

Metadata from the Dryad Repository record:

Publication Date: October 20, 2019

Abstract:

Our current transportation system faces a variety of issues in terms of safety, mobility, and environmental sustainability. The emergence of innovative intelligent transportation system (ITS) technologies such as connected and automated vehicles (CAVs) and transportation electrification unfold unprecedented opportunities to address aforementioned issues. In this project, we propose a hierarchical ramp control system that not only allows microscopic cooperative maneuvers for connected and automated electric vehicles (CAEVs) on the ramp to merge into mainline traffic flow under certain controlled ramp inflow rate, but also enables macroscopic corridor-level traffic flow control (i.e., coordinated ramp metering rate determination). A centralized optimal control-based approach is proposed to both smooth the merging flow and improve the system-wide mobility of the network. Linear quadratic trackers in both finite horizon and receding horizon forms are developed to solve the optimization problem in terms of path planning and sequence determination, and a microscopic electric vehicle (EV) energy consumption model is applied to estimate the energy consumption. Finally, traffic simulation is conducted through PTV VISSIM to evaluate the impact of the proposed system on a highway segment. The results confirm that under the regulated inflow rate, the proposed system can avoid potential traffic congestion and improve mobility significantly up to 102% compared to the conventional ramp metering and the ramp without any control approach.

Recommended citation:

Wu, Guoyuan; Zhao, Zhouqiao (2019), PTV VISSIM simulation data for efficient eco-ramp control project funded by NCST 18-19, Dryad, Dataset, https://doi.org/10.6086/D10M3D

Dataset description:
This dataset contains 1 .zip file collection described below.

doi_10.6086_D10M3D_v2.zip:
This collection contains 1 .zip file collection listed below.

- Simulation_Results.zip
    - This collection contains 6. Csv files listed below.
        - two_ramp_opt.csv
        - two_ramp_no_control.csv
        - two_ramp_baseline.csv
        - one_ramp_no_control.csv
        - one_ramp_baseline.csv

The .csv, Comma Separated Value, file is a simple format that is designed for a database table and supported by many applications. The .csv file is often used for moving tabular data between two different computer programs, due to its open format. The most common software used to open .csv files are Microsoft Excel and RecordEditor, (for more information on .csv files and software, please visit https://www.file-extensions.org/csv-file-extension).

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/10.6086/D10M3D. on 2021-04-15.

If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.