Dissecting the Safety Benefits of Protected Intersection Design Features Dataset

Dataset available at: https://doi.org/10.7910/DVN/4CNELH

(This dataset supports report **Dissecting the Safety Benefits of Protected Intersection Design Features,** http://safersim.nads-sc.uiowa.edu/final_reports/UM%202%20Y2__report.pdf)

This U.S. Department of Transportation-funded dataset is preserved by the SAFER-SIM University Transportation Center in the Harvard Dataverse Repository (https://dataverse.harvard.edu/), and is available at https://doi.org/10.7910/DVN/4CNELH

The related final report **Dissecting the Safety Benefits of Protected Intersection Design Features**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/50417

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Description: Protected intersections are an integral component of Complete Streets and are used to facilitate safe crossings for bicyclists and pedestrians at intersections. Their placement is ideal after segments with protected bike lanes where drivers might not be aware of bicyclists' presence. Protected intersections have the ability to increase drivers' awareness by increasing bicyclist visibility. While frequently implemented elsewhere, protected intersections are a relatively new bicycle treatment for North America. As such, there is a need to understand how its design elements contribute to safe interactions between drivers and bicyclists at an intersection. This study used a driving simulation environment to test the effectiveness of different design elements of protected intersections, such as bicycle crossing pavement markings and intersection radii, on the speed and attentiveness of drivers. Participants drove 12 scenarios where the roadway environment consisted of segments leading to protected intersections. Each scenario had two intersections where the drivers were guided to make a right and a left turn, respectively. Moreover, each scenario exposed drivers to different protected intersection designs, i.e., turning radii and pavement marking levels, and assessed their speed as they were completing turns while interacting with bicyclists or not. Participant demographics as well as driving and bicycling history were obtained through a questionnaire. Participants' speed and position were

recorded through the simulator. The analysis determined which combination of independent variables (i.e., pavement markings, turning radii of the protected intersection, and demographics) contributes to safe interactions between bicyclists and automobiles in a protected intersection. In particular, intersection approaching, turning, and exiting speeds were analyzed across the different scenarios and participant demographics. The results indicate that the presence of a bicyclist crossing a protected intersection significantly reduces speeds for drivers performing a right turn through that intersection. Larger intersection radii were found to reduce turning speeds as they are accompanied by larger corner islands and bigger curb extensions. Bicycle crossing pavement markings influenced only approaching speeds prior to the actual turn as that is when they were the most visible. Demographics (i.e., age and gender) and bicycling history were also observed to be affecting turning speeds, indicating that design elements alone cannot determine the safety effectiveness of a protected intersection. (2019-06-01)
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Dataset description:
This dataset contains 1 .zip file collection described below.

SAFER-SIM_Safety_Benefits_Protected_Intersection_Design_Features_Data.zip:
This collection contains 1 .xlsx file and 508 .plt files.

- The 1 .xlsx files is titled ExperimentalDesignTracker.xlsx. The .xlsx file is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.
- The 508.plt files are titled Pl_Sub_(numbered 1-20)_Drive_(numbered 00, 000, 00000, 01, 02, 1, 1-1, 2, 2-1, 3, 3-1, 4, 4-1, 5, 5-1, 6, 6-1, 7, 7-1, 8, 8-1, 9, 9-1, 10, 10-1, 11, 11-1, 12, 12-1, 123, 265, 444, or 3512)(.plt or _GroundSim.plt). Some examples of this titled structure are Pl_Sub_19_Drive_265_GroundSim.plt, Pl_Sub_10_Drive_6.plt, and Pl_Sub_4_000_GroundSim.plt. The .plt file is a vector graphics language potter document (for more information on .plt files and software, please visit https://www.file-extensions.org/plt-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://ntl.bts.gov/public-access) 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/10.7910/DVN/4CNELH on 2020-07-03. 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.