Enhancing School Zone Safety: Case Studies in Puerto Rico using Driving Simulation Dataset

Dataset available at: https://doi.org/10.7910/DVN/TUD094

(This dataset supports report Enhancing School Zone Safety: Case Studies in Puerto Rico using Driving Simulation <u>http://safersim.nads-</u>sc.uiowa.edu/final reports/C%203%20Y1%20UPR%20 Final%20Report.pdf)

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The related final report Enhancing School Zone Safety: Case Studies in Puerto Rico using Driving Simulation, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/42283

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Contact: Valdés Díaz, Didier M (University of Puerto Rico at Mayagüez) Description: Highway safety is of paramount importance in a technological era when cities are implementing smart features and smart mobility is gaining momentum. Our current cities are striving to become livable communities that accommodate all users of the transportation system [1]. Drivers and pedestrians coexist in urban environments that were developed to maximize

motorized mobility. In terms of school zones, the interaction of drivers and pedestrians is critical, with additional issues related to the possibility of distracted children crossing the streets [2] and drivers speeding along the school zones [3]. The intricacies of motor vehicles and pedestrian interaction generate dangerous situations for children in and around school zones. Statistics show that there is a significant safety problem in school zones. There are five teenager pedestrian fatalities every week in the United States and an increase of 13% in the pedestrian fatality rate of 12- to 19-year-olds since 2013 [2]. Contributory factors to this fatality rate include distracted walking, unsafe street crossing, unsafe drop-off or pick up zones, and poor signalization delimiting the school zone area [2]. A study conducted at two school zones in Mayagüez, Puerto Rico, showed that 89% of the students did not use the marked pedestrian crosswalk in front of the school to cross the road [4]. The pedestrian behavior observed in this study presents risky actions from the student population. Vulnerable road users (VRUs) are road users that, due to the lack of outside shield protection, sustain a higher risk of injury in case of a collision, namely pedestrians and bicyclists. Some road users can be considered to be more vulnerable than others, such as the elderly, the disabled, and children. According to the World Health Organization (WHO), pedestrians and bicyclists are a factor in 26% of all road-related fatalities worldwide [5]. The National Highway Traffic Safety Administration (NHTSA) indicates that pedestrian and bicyclist fatalities accounted for 18.2% of the 37,461 highway-related fatalities in the United States in 2016 [6]. There is a need for new traffic safety strategies that, along with law enforcement, engineering measures, and educational safety programs, will continue reducing and preventing deaths of VRUs in our transportation system. In Puerto Rico, various schools are in the vicinity of urban arterial roads with high traffic (over 20,000 vehicles per day, or vpd) and posted speed limits over 40 mph. Spot speed studies conducted at 19 schools located in the western region of Puerto Rico showed low driver compliance with the speed limits in more than half of the school zones studied [7, 8]. This type of driver behavior increases the risk of crashes. Safety programs, such as the Federal Highway Administration (FHWA) initiative Safe Routes to School (SRTS), have been developed to improve accessibility and safety around schools. After the implementation of the SRTS initiative in 18 states, reductions of 14% in injury risk and 13% in fatality risk were achieved for pedestrians and cyclists, respectively [9]. Driving simulators are cost-effective tools that allow the evaluation and analysis of driver performance when implementing emerging technologies, helping in the understanding human factors related to road safety without putting human lives at risk [10, 11]. This report presents the results of an operational and safety analysis to evaluate driver behavior in and around two school zones using the driving simulator of the University of Puerto Rico at Mayagüez (UPRM). The objective of this research was to evaluate driver behavior when approaching a school zone and the effectiveness of a new combination of road signage and pavement markings. The strategy behind the use of new traffic control devices (TCDs) in the driving simulator was to evaluate their effectiveness in controlling drivers' speeds. Two school zones located in the western region of Puerto Rico were used in a driving simulation experiment to compare the drivers' performance in existing conditions and a new TCD configuration. A survey was conducted to explore drivers' level of knowledge about TCDs in school zones to assist in the development of the simulation scenarios. (2019-05-01) Subject: Engineering

Related Publication: <u>http://safersim.nads-</u> sc.uiowa.edu/final_reports/C%203%20Y1%20UPR%20_Final%20Report.pdf Depositor: Heiden, Jacob Deposit Date: 2019-08-07

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Dataset description:

This dataset contains 1 RAR Archive file described below.

Database_SchoolZones.rar:

The .rar file contains 4 files further described below. A .rar file is a compressed archive format that can be opened with WinRAR, and other available software (for more information on .rar files and software, please visit <u>https://www.file-extensions.org/rar-file-extension</u>).

- <u>3 files in .csv:</u> The two .csv files found in this collection are titled Database_SchoolZones_FranklinDRoosevelt.csv and Database_SchoolZones_SUSamualAdams.csv. The titles represent the locations that correspond to the data within the file. 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 <u>https://www.file-extensions.org/csv-file-extension</u>).
- <u>1 file in .xlsx:</u> The .xlsx file found in this collection is titled Variables_SchoolZone.xlsx. The file contains a list of the variables that were used during the study. The .xlsx file is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.
- <u>1 unknown file type:</u> This file is titled _DS_Store.

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 (<u>https://ntl.bts.gov/public-access</u>) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at <u>https://doi.org/10.7910/DVN/TUD094</u> on 2019-09-05. 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.