Enhancing School Zone and School Bus Safety Dataset

Dataset available at: https://doi.org/10.7910/DVN/EVMA6J

(This dataset supports report **Enhancing School Zone and School Safety,** http://safersim.nads-sc.uiowa.edu/final_reports/UCF%20-%20C3%20Y1_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/EVMA6J

The related final report **Enhancing School Zone and School Bus Safety**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/42276

Metadata from the Harvard Dataverse Repository record:

Description: Safety issues in school zone areas have been one of the most important topics in the traffic safety field. This research project assesses the safety effects of different roadway countermeasures in school zone areas. Although many studies have evaluated the effectiveness of various traffic control devices (e.g., sign, flashing beacon, speed monitoring display), there is a lack of studies exploring different roadway countermeasures that might have significant impacts on the school zone safety. In this research project, the most crash-prone school zone was identified in Orange and Seminole Counties, Florida, based on crash rate, which is defined as crash per thousand daily vehicle miles traveled. The results showed that Westridge Middle and Sadler Elementary schools were the top two crash-prone school zones. Afterward, a microsimulation network was built in VISSIM to test different roadway countermeasures in the school zones. Before applying different countermeasures, the network was calibrated and validated by traffic volume and travel time in order to replicate the real field. Three different countermeasures—two-step speed reduction, decreasing the number of driveways, and converting the two-way left-turn lane (TWLTL) to a raised median—were implemented in microsimulation and compared with the field condition. For each countermeasure, we also ran different sub-scenarios. In two-step speed reduction, we analyzed three sub-scenarios that were defined by the maximum speed limit on the main roadway. The number of driveways was reduced by 25%, 50%, 75%, and 100%, so four sub-scenarios were used to analyze in this countermeasure. We replaced TWLTL with a raised median, so all the left-turning vehicles made left turns either at the intersection or median. Therefore, two sub-scenarios, intersection U-turn and median U-turn, were analyzed. Surrogate safety measures are widely used as indicators to evaluate crash risk in the microsimulation software as it cannot directly measure the traffic crashes. In this research project, three surrogate safety measures were used; two of them were developed from time-to-collision (TTC) notations. Three surrogate safety measures—time-exposed time to collision (TET), time-integrated time to collision (TIT), and (3) time-exposed rear-end crash risk index (TERCRI) —were utilized in this research project as indicators for safety evaluation. The higher value of surrogate safety measures indicates higher crash risk. The results showed that all the sub-scenarios in two-step speed reduction and decreasing driveway access reduced TET, TIT, and TERCRI values significantly compared to the base condition. Moreover, the combination of two-step speed reduction and decreasing driveway access countermeasures outperformed their individual effects as well as the base condition. The one-way ANOVA analysis showed that all the sub-scenarios were significantly different from each

other. Sensitivity analysis was also conducted to capture the impact of different sub-scenarios for different values of TTC threshold. The results show that all the sub-scenarios in two-step speed reduction and decreasing the number of driveway access reduced TET, TIT, and TERCRI values significantly for different values of TTC threshold, which ranged from 1 to 3 s. Conversely, for converting the TWLTL to the raised median, the crash risk was higher than the base condition because the value of TET, TIT, and TERCRI was much higher than the base condition. Therefore, the results of this research project provide useful insights for transportation and safety planners.

Subject: Engineering

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

SAFER-SIM_Enhancing School Zone and School Bus Safety.zip:
This collection contains 50 files listed below.

- Total_Crash_Per_DVMT_for_200FT.shp.xml
- Total_Crash_Per_DVMT_for_200FT.dbf
- Total_Crash_Per_DVMT.shx
- Total_Crash_Per_DVMT.shp.xml
- Total_Crash_Per_DVMT.shp
- Total_Crash_Per_DVMT.sbx
- Total_Crash_Per_DVMT.sbn
- Total_Crash_Per_DVMT.prj
- Total_Crash_Per_DVMT.dbf
- Total_Crash_Per_DVMT.cpg
- TEXAS_AVE_WEST.xlsx.bak
- TEXAS_AVE_WEST.xlsx
- TEXAS_AVE_EAST.xlsx.bak
- TEXAS_AVE_EAST.xlsx
- Schema.ini
- SAS.sas
- S_john_west.xlsx.bak
- S_john_east1.xlsx.bak
- S_john_east1.xlsx
- point.shx
- point.shp
- point.sbx
- point.sbn
- point.prj
- point.dbf

- OBT_West.xlsx.bak
- Millenia_West.xlsx.bak
- Millenia_West.xlsx
- line.shx
- line.sbn
- InDr_West.xlsx.bak
- InDr_West.xlsx
- InDr_East.xlsx.bak
- InDr_East.xlsx
- Contents.txt
- CDF for speed.sas
- AADT_for_school.shx
- AADT_for_school.shp.xml
- AADT_for_school.shp-R.xml
- AADT_for_school.shp
- AADT_for_school.sbx
- AADT_for_school.sbn
- AADT_for_school.prj
- AADT_for_school.dbf
- __S_john_west.xlsx_Error.txt
- __OBT_East.xlsx.bak_Error.txt
- __line.sbx_Error.txt
- __line.dbf_Error.txt
- __All_Errors.txt

File Type Descriptions:

- The .xlsx file is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.
- The .txt file type is a common text file, which can be opened with a basic text editor. The most common software used to open .txt files are Microsoft Windows Notepad, Sublime Text, Atom, and TextEdit (for more information on .txt files and software, please visit https://www.file-extensions.org/txt-file-extension).
- The .xml file type is commonly used for files written in Extensible Markup Language (XML). The xml file is structured text file with various content for many programs. XML is a human-readable, machine-understandable, general syntax for describing hierarchical data, applicable to a wide range of applications (databases, e-commerce, Java, web development, searching, etc.). Many programs can be used to open .xml files, NTL frequently uses NotePad++ when working with .xml files (for more information on .xml files and software, please visit https://www.file-extensions.org/xml-file-extension).
- The shp file extension is used for ESRI Shape format, a popular geospatial vector data format for geographic information systems software. A shapefile stores non-topological geometry and attribute information for the spatial features in a data set. A shapefile consists of a set of 3 mandatory files, along with several optional files. Each file in the set shares the shapefile name with a different extension. The main file .shp stores the geometry and must always have an index file shx. A dBASE file dbf stores all the

attributes of the shapes in the main file. Additionally, a projection file prj stores the projection information (for more information on .shp files and software, please visit https://www.file-extensions.org/shp-file-extension).

- A .shx file contains compiled shape data (building blocks, fonts) in form of the machine language compiled version of an shp file. The file type is associated with AutoCAD , a CAD development platform, developed and sold by Autodesk, Inc (for more information on .shx files and software, please visit https://www.file-extensions.org/shx-file-extension).
- The prj file extension is traditionally used for files that contain projects. Projects contain settings, positions of saved windows, development notes and other raw data that won't be present in the final file (for more information on .prj files and software, please visit https://www.file-extensions.org/prj-file-extension).
- The dbf file extension is traditionally used for database file by many database applications. The original program, which used the DBF file extension for its database, was dBAse. A major legacy of dBase is its dbf file format, which has been adopted in a number of other applications. For example, the shapefile format developed by ESRI for spatial data in a geographic information system uses .dbf files to store feature attribute data (for more information on .dbf files and software, please visit https://www.file-extensions.org/dbf-file-extension).
- The sbx file extension is associated with the ArcView GIS application used to view and edit GIS data. The .sbx file contains spatial index for read-write shape used to fast access to shape files (for more information on .sbx files and software, please visit https://www.file-extensions.org/sbx-file-extension-arcview-spatial-index-for-read-write-shape-file).
- The sbn file extension is mainly associated with ArcView / ArcGIS geography software from ESRI. The sbn file contains binary spatial indexes, which are used only by ESRI software. The format is not documented, and is not implemented by other vendors (for more information on .sbn files and software, please visit https://www.file-extensions.org/sbn-file-extension).
- The cpg file extension is associated with the ArcGIS, a geographic information system for Microsoft Windows operating system, developed by Esri. The cpg file stores codepage for identifying a characterset (for more information on .cpg files and software, please visit https://www.file-extensions.org/cpg-file-extension-arcgis-codepage).
- The bak file extension is traditionally used for backups for decades. Generally speaking, a bak file is a backup of original file, when the original extension is renamed to somename.bak. So, to restore original file, rename file to its original extension, if you know it, that is. Many software apps also auto save with original documents or projects also a backup copy with the same file name (for more information on .bak files an software, please visit https://www.file-extensions.org/bak-file-extension).
- The ini file extension is primarily used for configuration files in many Windows applications. A typical .ini file contains set of parameters for the program to be used when its started. Probably short for initialize. (for more information on .ini files and software, please visit https://www.file-extensions.org/ini-file-extension)
- The sas file extension is generally related to SAS software. SAS is an integrated system of software products provided by SAS Institute Inc. aimed mainly at statistic analysis and

data management (form more information on .sas files and software, please visit https://www.file-extensions.org/sas-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/FTUNZD on 2020-05-04. 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.