Urban Transportation Infrastructure and Cyclist and Pedestrian Safety

Project Number:

20SAUTSA35

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Funding Source(s):

Tran-SET

University of Texas at San Antonio

Total Project Cost:

$100,000

Compiling crash data and site characteristics involving bicyclists and pedestrians throughout Region 6

The Federal Highway Administration (FHWA) has designated eight cities in Region 6 as Bicycle and Pedestrian Safety Focus Cities to highlight the need for improved safety for the most vulnerable road users in these cities. Moreover, FHWA's Highway Safety Improvement Program (HSIP) safety performance measures call for state and regional targets to help minimize highway fatalities and injuries, including those involving pedestrian and cyclists. The purpose of this research is to gather crash and operational data and perform a comprehensive assessment of the risk factors and root causes of crashes involving pedestrians and bicycles in San Antonio, prioritize the risk factors, identify hotspots, identify and evaluate safety countermeasures, and recommend the best countermeasures. The analysis will include review of crash narratives and diagrams, and pedestrians, bicyclists, and motorists' movements and actions prior to a crash, as well as the common environment characteristics that contribute to unsafe actions and conditions. This data can be used to develop educational programs to prevent such crashes. The developed countermeasures will address regional and state targets to reduce accidents and achieve the FHWA goal to reach zero deaths in the next two decades.

Problem Statement

Most accessible literature on cyclist and pedestrian crashes is focused on the numbers, seriousness of injuries, and spatial and temporal distributions of crashes. Thorough analysis of the interactions of bicyclists, pedestrians, and motorists, and infrastructure at the crash time is required to identify crash-preventing options, and the common characteristics of the transportation infrastructure that contribute to them (obstructions). The outcomes of this analysis can be implemented to reduce cyclist and pedestrian fatalities and injuries and to critically develop regional and state targets.

Objectives

The goal of this project is to perform a comprehensive evaluation of crash causes and variables to identify the main causes of crashes involving bicyclists and pedestrians in San Antonio. The researchers will draft a database of bicycle and pedestrian crash reports in the target area, calculate crash counts and rates, and identify bicycle and pedestrian crash hotspots. The crash data analysis will include detailed analysis of the crash narratives and diagrams as part of the database-building process to help show the true causes of the crashes. The evaluation will include operational and physical characteristics of the crash locations, severity of injuries, environmental conditions, characteristics of victims, motorist behaviors, and the common features of the built environment that contribute to unsafe actions and conditions. This evaluation will allow the research team to identify corridors and intersections with high crashes and the unsafe actions that contribute to the crashes and provide safety solutions and recommendations for further study in these areas.

Figure 1: Pedestrians and Cyclists Traffic Sign

Intended Implementation of Research

Workforce Development: This will be achieved directly by training graduate, undergraduate, and high school students interested in pursuing a career in STEM or Transportation Engineering career.

Education: This task supports the federal initiative to build the next generation of transportation professionals to meet the demands of the rapidly changing the 21st-century transportation system. The PI currently supports and mentors five graduate students and three undergraduate students from external grants. The proposed study will help the PI to recruit and train more graduate and undergraduate students in transportation research.

Outreach: Technical articles, posters, and presentations will be delivered at national and local conferences and symposia such as ASCE, Transportation Research Board, ARDOT, Tran-SET, and Create@STATE. Also, a Create@State radio (KASU) podcast will be prepared.

Anticipated Impacts/Benefits of Implementation

The proposed research includes compiling and analyzing data from different sources including site visits. Other tasks include analysis and synthesis of safety information and spatio-temporal analysis, mail-out surveys, driver/bicyclist/pedestrian observations, and reporting. The project tasks will be implemented in consultation with the City of San Antonio traffic engineers and other parties in Region 6. The research team will deliver the following upon completion of this study:

1. A summary of relevant research conducted in the US and beyond.
2. Data on the measures that have been implemented to promote safety and their efficiency.
3. A final report documenting work performed and its results.
4. 4. A technical brief to be used by traffic engineers to help determine how to address safety issues at hotspot roadway sections and intersections and provide the best solutions for motorists/pedestrians and members of local communities.
5. 5. A PowerPoint presentation to be shared with local communities.

Web links

- Tran-SET's website https://transet.lsu.edu/research-in-progress/

Tran-SET

Tran-SET is Region 6's University Transportation Center. It is a collaborative partnership between 11 institutions (see below) across 5 states (AR, LA, NM, OK, and TX). Tran-SET is led by Louisiana State University. It was established in late November 2016 "to address the accelerated deterioration of transportation infrastructure through the development, evaluation, and implementation of cutting-edge technologies, novel materials, and innovative construction management processes".

Learn More

For more information about Tran-SET, please visit our website, LinkedIn, Twitter, Facebook, and YouTube pages. Also, please feel free to contact Dr. Momen Mousa (Tran-SET Program Manager) directly at transet@lsu.edu.