# Impact of Urban Transportation Infrastructure and Motorist Behavior on Motorcycle Crashes

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**Principal Inverstigator(s):**

Hatim Sharif

University of Texas at San Antonio

**Lead Institution:**

University of Texas at San Antonio

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Tran-SET

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**Total Project Cost:**

$ 100,000

*Evaluating infrastructure and motorist behavior impact on motorcycle crashes*

The Fatality Analysis Reporting System database shows that, in stark contrast to the 34- percent decline in non-motorcyclist crash–related fatalities, motorcyclist crash–related fatalities were up 86 percent with only three year-to-year declines since 1997, while non-motorcyclist crash–related fatalities had 13 year-to-year declines since 1997. At the national level, the rate of motorcyclist fatalities per vehicle mile traveled is 29 times higher than the rate among passenger car occupants, with overall injury rates approximately five times higher among motorcyclists than passenger car occupants. Given the frequency of motorcycle crashes and their staggering toll in terms of loss of life and economic costs across Region 6, there is an urgent need to continue to work diligently toward driving the frequency of these crashes toward zero. The purpose of this research is to perform a comprehensive evaluation of crash and operational data to understand the complex nature of motorcycle crashes in Texas through construction of a motorcycle crash database and a multi-year analysis of these data in with an emphasis on the prevention of fatal and incapacitating injury crashes in Region 6.

## Problem Statement

The frequency of motorcycle crashes in Region 6 and their potential for notable costs in terms of loss of life and economic costs are increasing. Consequently, there is an urgent need to understand the complex nature of motorcycle crashes through construction of a motorcycle crash database, performing detailed crash analysis, development of countermeasures to reduce the frequency and severity motorcycle crashes. 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 motorcycles. Most available literature on motorcycle crashes is focused on the numbers, severity, and spatial and temporal distributions of crashes. Detailed analysis of the interactions of motorcyclists, other road users, and infrastructure at the crash time is necessary

to identify the countermeasures needed to prevent such crashes as well as the common characteristics of the transportation infrastructure that contribute to them (e.g., road characteristics/geometry, intersections, lighting conditions, and signage). The outcomes of such analysis can be actionable measures to reduce fatalities and injuries resulting from crashes that involve and to strategically develop regional and state mitigation targets. Moreover, the economic downturn resulting from COVID-19 pandemic led to a significant drop in travel demand and motorcyclist/driver's exposure to collisions but studies suggested that it had a differential impact on different road users. For example, research on previous economic recessions suggests that these conditions affect the mental wellbeing of people and consequently their behavior on the road. COVID-19 pandemic effects in terms of motorists' behavior, the unusually lower traffic volumes, and road safety in general are currently unknown, as the unprecedented nature and severity of this pandemic do not resemble anything seen before. Several research questions may arise on the potential motorcyclist/driver- and environment-related factors associated with COVID-19 pandemic that may affect traffic safety during and well after the pandemic. This study will also include an indepth analysis aiming at pinpointing variables that may have affected road safety involving motorcycles during the pandemic.

## Objectives

The main goal of this project is to perform a comprehensive evaluation of crash and operational data to identify the root causes of crashes involving motorcycles in Texas. The specific objectives include (1) collection of safety and operational data pertinent to motorcycle crashes, (2) performing safety and operational analysis, (3) identifying the primary crash factors through analysis and field observation, and (4) developing countermeasures to reduce the rates and severity of motorcycle crashes in Region 6.

## Intended Implementation of Research

The research findings will be convened in the form of a list of recommendations, a technical brief, an educational PowerPoint presentation targeting local communities, and a final report. The project tasks will be implemented in consultation with the City of San Antonio traffic engineers and planners and other interested entities within Region 6.

## Anticipated Impacts/Benefits of Implementation

The research will include an in-depth analysis aiming at pinpointing variables that may have affected road safety associated with motorcycles during the pandemic. Hence, the implementation of this research will support Tran-SET's vision to address the accelerated deterioration of the transportation infrastructure. Furthermore, the implementation of this research will d provide safety countermeasures and recommendations for further study. The implementation of this research will also improve the safety on Region 6 highways.

## 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.