# Development of a Web Application for Traffic Accident Mapping and Analysis

**Project Number:**

22SAUNM36

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Tran-SET

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**Total Project Cost:**

$ 150000

*Developing a web application for mapping and analyzing traffic accidents*

It is widely accepted that road traffic safety is a significant public health issue. One of the effective ways to improve road traffic safety is analyzing crash data to understand where traffic accidents occur, identify associated spatial and temporal patterns, and determine causation. In the State of New Mexico, locations of traffic accidents are currently visualized using a variety of static maps. Although these statics maps are easier to create and producers can control how users view the data, users cannot customize these maps to meet their special needs. That being said, new maps need to be created for any update or modification. More importantly, these static maps are not able to visualize crash density information because users cannot zoom in or zoom out, and hence they cannot be used to identify any associated spatial and temporal patterns. Subsequently, it is challenging if not impossible for users to conduct additional analyses to determine the causes of traffic crashes in an efficient, effective, and accurate manner. To solve the problems inherent with the current static maps, this research project will focus on exploring the utility of dynamic and interactive web mapping and visualization techniques to visualize and analyze traffic crash data with the aim of helping transportation planners, engineers, and policymakers determine the causes of traffic crashes and identify high-crash locations and other associated spatial and temporal patterns, and ultimately, achieving improved safety, enhanced resiliency, and increased efficiency for road users.

## Problem Statement

Road traffic safety is a significant public health issue. According to the latest statistics from the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation, New Mexico has the fifth highest motor-vehicle fatality rate in the United States at 18.7 fatalities per 100,000 residents (67.0% higher than the national average). In addition, New Mexico has the highest pedestrian fatality rate in the United States at 3.5 pedestrian fatalities per 100,000 residents (92.4 higherthan the national average). Moreover, New Mexico is frequently

ranked among the most dangerous states for bicyclists. Subsequently, there is a significant need for improved traffic safety in the State of New Mexico. While there is significant need for improved traffic safety in New Mexico, there has also been recent progress, including Albuquerque's Vision Zero pledge and Complete Streets Ordinance. However, while attention and resources are being dedicated to road traffic safety issues, significant barriers still exist. Because much of New Mexico is rural and/or socio-economically disadvantaged, many communities and government agencies in New Mexico do not possess the resources such as personnel with expertise to visualize, analyze, and interpret complex crash datasets. Consequently, many communities and government agencies in the State of New Mexico still rely on static crash maps (oftentimes provided in PDF format) or anecdotal evidence to assist with decision-making.

## Objectives

The proposed project includes four objectives: (1) developing a web application to visualize and analyze traffic crash data to improve safety; (2) establishing procedures and approaches for incorporating a spatial-based web application into a transportation agency's decision-making process; (3) developing a guidebook for the use of the developed web application to improve safety; and (4) providing technology transfer webinars or workshops to transportation management agencies on how to visualize and use the traffic crash data.



**Figure 1. A static traffic map**

## Intended Implementation of Research

**Workforce Development, Education, and Outreach:** Research findings will be distributed through: (1) scientific peer-reviewed publications; (2) training workshops; and (3) technology transfer to state DOTs, specifically state DOTs in the Tran-SET region. The proposing institution serves a majority of minority populations, including both Hispanics and Native Americans and the PIs will seek to engage students from these populations in the proposed research project.

## Anticipated Impacts/Benefits of Implementation

The project will leverage recent advancements in web mapping techniques to develop a web application to visualize and analyze traffic crash data. The proposed research will make intellectual contributions to advance the area of transportation safety in four primary areas: (1) advancement of knowledge of the process and outcomes of using dynamic and interactive online mapping techniques to visualize and analyze traffic crash data; (2) establishment of procedures and approaches for incorporating a spatial-based web application into a transportation agency' decision support system; (3) improvement of safety to enhance transportation resiliency and efficiency; and (4) promotion of workforce development through learning and continuous education.

## 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.