

COVID-19 and Traffic Safety: Role of Infrastructure and Exposure

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Lead Institution:

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\$ 100,000



Identifying strategies for improving traffic safety during Covid-19

At the time of this writing, the COVID-19 pandemic continues to intensify, with 106,314,695 confirmed cases and 2,320,720 deaths spread across nearly every country on Earth. Early lockdowns largely kept people at home, thereby reducing traffic levels. Theoretically, reduced traffic exposure should result in reduced motor vehicle crashes. However, a variety of factors complicate this relationship. Empty streets provide increased opportunity for speeding and aggressive driving behavior. More consumption of alcohol and drugs during lockdowns could translate to more driving while intoxicated. Public transit trips have decreased by 85% in some cities, with many of these trips converting to less-safe personal vehicles. Similarly, higher levels of vulnerable road users on the streets may lead to worse safety outcomes. Emergency services were stretched thin, so enforcement and emergency response times to motor vehicle collisions may have decreased in some locations. The overall goal will be to understand how the COVID-19 pandemic has impacted travel behavior, collision frequencies, and collision severity. There are three initial hypotheses. First, overall decreases in traffic exposure have resulted in decreases in crash frequency but increases in crash severity. However, these increases in injuries and fatalities will not be distributed evenly. Therefore secondly, large and fast roadways and networks based on the functional classification system will have experienced worse safety outcomes while traditional networks with smaller roadways will have experienced improved outcomes. Third, the impacts of roadway design and networks will outweigh the impacts of other contributing factors or changes to exposure.

Problem Statement

How has the COVID-19 pandemic impacted traffic safety? Have contributing factors and travel behaviors been altered, and how have those changes affected collision frequencies and severities? We anticipate that the answers to these questions will not only help us to improve outcomes during the next pandemic or transportation-altering event, but will also help us

to better understand underlying principles of traffic safety.

Initial analyses into these research questions have provided intriguing preliminary results. Overall crash frequencies decreased during early stages of the pandemic in several states, as we would expect with less people on the road. At the same time, fatality rates in Massachusetts increased and pedestrian fatality rates in Nevada and Rhode Island increased, a surprising irregularity if exposure has decreased.

Findings in this study will not only help us improve traffic safety during pandemics and other disasters and emergencies, but will also reveal intrinsic safety characteristics of roads and networks, allowing us to improve safety outside of pandemics.

Objectives

The objective of this research is to identify and evaluate strategies for improving traffic safety during COVID-19, other emergencies, and in general. To accomplish this, the research will review root causes of traffic crashes, injuries, and fatalities both before and after COVID-19.

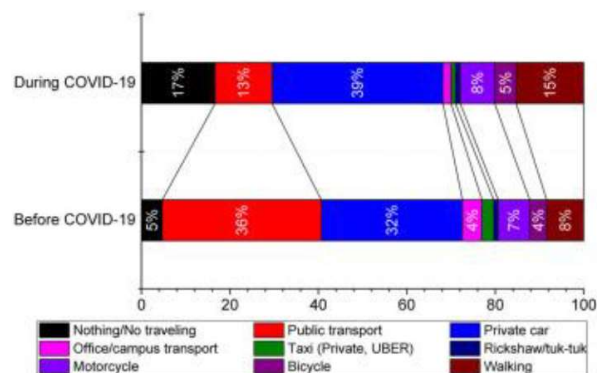


Figure 1. Mode for outdoor trips before and during COVID-19 pandemic.

Intended Implementation of Research

Dissemination will occur through peer exchange in the form of peer-reviewed publications, presentations at conferences including the Transportation research Board Annual Meeting and/or Tran-SET Conference, integration into coursework, participation of student researchers, coordination with the Local Technical Assistance Program housed at UNM, and/or sharing with other stakeholders through in-person meetings and webinars. It is anticipated that each of the three analyses will be published in a peer-reviewed journal. While the study will occur in Region 6, it is expected that the findings will be relevant to DOTs nationwide.

The project will employ at least one graduate student, helping to develop their scholarship and investing in a future member of the transportation workforce. In addition, the report will inform current best practices in pedestrian safety and can be used for education and training of the current workforce around the region and the country.

Anticipated Impacts/Benefits of Implementation

This research project will benefit Region 6 by introducing guidance addressing traffic safety relative to COVID-19 and in general. Reducing the burden of traffic fatalities and injuries has been identified as a valuable target by DOTs across the country. Other states within the region and across the country may benefit from the guidance that introduces effective infrastructure and travel behavior solutions to ensure the safety of all users.

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.

