

Improvements to Traffic Simulation Models of Freeway Work Zones

(STRIDE Project J: Improving Work Zone Mobility through Planning, Design and Operations)

PROJECT OVERVIEW

Work zones on freeways often result in lane closures and increased congestion. Traffic simulation models can help transportation agencies develop better traffic control strategies to manage and mitigate congestion.

RESEARCH GOAL

The goal of this project was to develop and calibrate a traffic simulation model (VISSIM) of a rural freeway work zone to better reflect driver behavior and capabilities of the vehicle fleet present.

FINDINGS

The traffic field data collected for this study in a 2-to-1 lane closure found that driver behavior parameters of standstill distance and lane-change distance are substantially larger than the default values provided in VISSIM. In a separate simulation modelling 3-to-1 lane closures, late-merge scenarios generally outperformed early merge behavior scenarios. The length of the lane closure did not have any substantial impact on traffic operations.

At another location with a 3-to-2 lane closure, observations of driver behavior were made through the processing of video camera images. Driver merging tended to happen further in advance of a lane closure on a straight section of freeway than in a horizontal curve, and heavy truck drivers tended to merge further in advance than passenger car drivers.

PRODUCT

Improvements to Traffic Simulation Models of Freeway Work Zones

Improvements to VISSIM traffic simulation models of freeway work zones were developed in this research project. The recommended values, in lieu of the default settings, more accurately replicate field conditions for properties including truck acceleration characteristics, standstill distance, and time headway distribution. These values should be suitable for modeling freeway work zones in rural settings in the southeast region, and the truck acceleration characteristics representative of the U.S. trucking fleet should be generalizable to typical freeway conditions across the nation.

For more information on J: Improving Work Zone Mobility through Planning, Design and Operations, visit the [STRIDE Project page](#)

PRODUCT

Improvements to traffic simulation models of freeway work zones

Using field data, parameters that reflected traffic in rural freeway work zones were defined for the VISSIM model.

IMPACT

More accurate modeling of traffic conditions in freeway work zones can inform agencies on how best to reduce congestion when planning lane closures.

WHO BENEFITS?

- Transportation agencies planning and designing work zones on freeways
- Traffic simulation modelers

RESEARCH TEAM

Rod Turochy, Ph.D. (Lead PI)

Auburn University
rodturochy@auburn.edu

Virginia Sisiopiku, Ph.D.

University of Alabama at Birmingham

Billy Williams, Ph.D.

North Carolina State University

James Tsai, Ph.D.

Georgia Institute of Technology

About STRIDE

The [Southeastern Transportation Research, Innovation, Development & Education Center \(STRIDE\)](#) is the 2016 Region 4 (Southeast) U.S. Department of Transportation University Transportation Center headquartered at the [University of Florida Transportation Institute \(UFTI\)](#).

