



## Florida Department of Transportation Research

Impact of Lane Closures on Roadway Capacity

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Lane closures during roadway repairs can inconvenience travelers and impact local economies by delaying commercial vehicles. The Florida Department of Transportation (FDOT) wanted to update its methodologies for planning lane closures on two-lane and arterial roadways. Researchers at the Transportation Research Center at the University of Florida conducted a three-part study to develop the new models. Because lane closure sites were not readily available from which to collect field data, they used simulations to generate data for use in developing the models.

In Part I, researchers created a custom simulation program called FlagSim. They developed FlagSim because a suitable simulation program for modeling lane closures on two-lane, two-way roadways was not available. Researchers used this program to develop analytic models for estimating work zone travel speed, saturation flow rate, queue delay, and queue length for lane closures on two-lane roadways. These models have been incorporated into a comprehensive analysis spreadsheet that will replace the current analysis method. FlagSim can also be adapted to study issues beyond the scope of the analysis spreadsheet, such as non-standard vehicle performance characteristics, different flagging methods, or oversaturated work zone traffic conditions.

In Part II, researchers focused on developing capacity models for arterials with lane closures near a traffic signal. They used the CORSIM simulation program to develop traffic capacity models for several different arterial work zone configurations. The models are ready to be tested on existing and planned work zone closures so that field data can be collected in



*An arterial road lane closure in a high traffic area of US 441 in Gainesville, FL.*

the future to validate these models. However, if the models are to consider how additional factors (e.g., roadway geometry) impact work zones, they will need to be modified.

The lane closure analysis procedure currently in use by FDOT requires an estimate of normal hourly traffic demand, called the Remaining Traffic Factor (RTF), in proposed work zones. In Part III, the researchers developed models for estimating RTF. A survey of drivers to determine if they would use other routes to avoid work zone areas revealed that travel time, work zone location, and weather conditions would influence their decisions. The researchers used the survey data to develop models for estimating RTF in both short-and long-term work zones. The models are implemented using a spreadsheet tool.

Once tested and verified, these various models might be used to develop work zone plans that should result in reduced traffic impacts to motorists.

Project Manager: Frank Sullivan, Roadway Design, [frank.sullivan@dot.state.fl.us](mailto:frank.sullivan@dot.state.fl.us)

Principal Investigator: Scott Washburn, University of Florida, [swash@ce.ufl.edu](mailto:swash@ce.ufl.edu)