



# RESEARCH PROJECT CAPSULE [18-3SS]

October 2017

TECHNOLOGY TRANSFER PROGRAM

## Evaluation of DOTD's Existing Queue Estimation Procedures

### JUST THE FACTS:

**Start Date:**  
August 1, 2017

**Duration:**  
24 months

**End Date:**  
July 31, 2019

**Funding:**  
TT-Fed/TT-Reg

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### POINTS OF INTEREST:

Problem Addressed / Objective of  
Research / Methodology Used  
Implementation Potential

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### PROBLEM

Issues related to traffic mobility in freeway work zones include vehicle delay, queues on roads under construction, and traffic jams on local roads caused by diverted freeway traffic trying to bypass a work zone.

Many traffic simulation

and analysis tools have been developed for analyzing traffic mobility issues, with some specifically designed for work zones.



Figure 1  
Traffic queue at workzone

Current state legislation requires the Louisiana Department of Transportation and Development (DOTD) to perform a traffic queue analysis on any construction or maintenance project that requires the temporary closure of a lane on a controlled-access principal arterial interstate. Queue-development start time and maximum length of queue are two important parameters to be determined from a queue analysis. DOTD's Traffic Engineering Manual further explains the queue analysis requirements in terms of which traffic conditions warrant the analysis. DOTD's policy is to schedule lane closures in a manner that minimizes traffic queue formation.

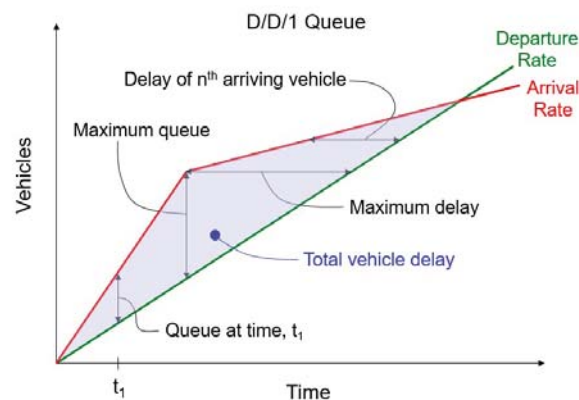


Figure 2  
Queuing diagram

DOTD formerly used a spreadsheet tool based on the Highway Capacity Manual (HCM) to estimate freeway capacity and queuing for ongoing and proposed projects, but more recently uses a constant 1309 passenger car per hour per lane (pc/h/ln) freeway work zone capacity. The accuracy of the queue estimation when

using this capacity constant is unknown because the results have not been adequately compared to actual work zone queuing.

## OBJECTIVE

The primary objective of this study is to evaluate the effectiveness of DOTD's queue estimation procedures by comparing results with those obtained directly from site observations through video camera footage or other means. Actual queue start times and queue lengths during the closure of one or more lanes at a freeway work zone will be measured and compared with results obtained from the HCM-based spreadsheet tool and/or results obtained when using the 1309 pc/h/ln capacity constant.

## METHODOLOGY

Initially, the research team will determine the queue analysis tools that DOTD and other state DOTs are using, and contact users of these tools to get insight regarding pros and cons of each, including any identified limitations.

The research team will work with DOTD traffic engineering personnel for the selection of candidate sites for monitoring during lane closures at work zones. The research team will collect data from the selected sites so that queue start times and queue lengths may be determined empirically.

Results from DOTD's queue estimation procedures (HCM or capacity constant) will be obtained for each site. Data analysis will be performed to evaluate DOTD's queue estimates through comparison with results from the empirical studies.

## IMPLEMENTATION POTENTIAL

If DOTD's current queue estimation tools are validated and found to be accurate, no further action may be required, and DOTD can confidently continue using them. If the current tools are found to significantly overestimate or underestimate actual queues, development of a better estimation tool may be warranted.