



# Mitigating Traffic Congestion on I-10 in Baton Rouge, LA: Supply- and Demand-Oriented Strategies & Treatments

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POP: May 2017 – November 2018 Analyzing congestion mitigation strategies at and near the I-10 Mississippi River Bridge via a microsimulation model

Traffic congestion and the resulting unreliable transportation system performance are major impediments to sustainable economic growth, productivity and urban area vitality. Traffic congestion is caused by several factors including inadequate base capacity, increased demands, traffic control devices, traffic incidents, work zones, special events and weather. Unreliable travel times and delays to region-wide commuters, late deliveries, limited skilled labor markets, increased stress levels, and air pollution are examples of the impacts of congestion on commuters, shippers, just-in-time manufacturing processes and complex supply-chain networks. A 2009 study entitled ?Gridlock and Growth? found that a 10% reduction in travel times could boost production of goods and services by 1%, leading to tens of billions of dollars in higher income and output in urban areas.

## **Problem Statement**

According to TTI's "2015 Annual Mobility Scoreboard" and the Baton Rouge Area Capital Region Industry for Sustainable Infrastructure Solutions (CRISIS), the Baton Rouge area has been suffering from severe traffic congestion that threatens the economic development in the area. Baton Rouge is listed as the third worst for midsized urban areas in the category of average commuter annual traffic delay. The Baton Rouge area also ranks second worst among mid-sized cities for the amount of annual excess fuel consumed per commuter, and number one on the list for the amount of money congestion is costing the average commuter per year, at \$1,262. Baton Rouge also ranks third worst for cities its size both for freeway travel reliability, and for total truck congestion costs per year, at \$189 million. Reasons for this congestion in Baton Rouge include the high freight demand imposed by the oil and gas industry in the area and the high population density of 700,000 in Baton Rouge Metropolitan Area, which generates around 3.2 million vehicle trips every day. These high demands and daily trips impose severe delays, and long lasting, fast spreading breakdowns on the transportation infrastructures in Baton Rouge.

One of the main facilities suffering from severe traffic conditions in Baton Rouge is the I-10 Mississippi River Bridge.

# Summary

This study aims to identify potential traffic mitigation solutions by:

- Conducting a comprehensive review of recently completed projects and studies related to the congestion problem in Baton Rouge.
- Identifying the major sources of traffic and congestion data in Baton Rouge with the focus on the I-10 Mississippi River Bridge.
- Conducting a preliminary analysis of the compiled data to identify the extent of the congestion problem around the I-10 Mississippi River Bridge - and to appropriately define the study boundary for model development.
- Identifying potential counter measures to address the congestion problem at the I-10 Mississippi River Bridge. Measures for mitigating congestion can be classified into two basic groups: supply-oriented and demandoriented measures. Supply measures add capacity to the system or make the system operate more efficiently. Demand measures focus on drivers and travelers and attempt to modify their trip-making behavior. Due to the correlated interaction of supplyand demand-oriented solutions, a combination of both will be identified.
- Developing, calibrating, and validating a simulation model. - Developing appropriate simulation scenarios based on the identified counter measures. - Analyzing the counter measures utilizing the simulation model and output.





Figure 1. Location of top bottleneck origins/locations. Locations of targeted mitigation strategies.

1. On-ramp: LA-1 to I-10 Mississippi Bridge

2. Off-ramp: to Nicholson Dr. and Highland Rd.

3. Split: I-110 North and I-10 East

4. On-ramp: Louis Street:

5. Off-ramp: Washington Street (Been identified by other studies before to be problematic)

6. Off-ramp: Darlymple Dr.

7. On-ramp from Nicholson Dr. to I-10 West

8. Off-ramp to LA-1

# **Findings**

The research team has identified and collected most of the recently completed projects' reports related to the congestion problem on the I-10 Mississippi Bridge. Review of these reports concluded that the construction of a new bridge is the only identified solution that could significantly solve the existing bridge's congestion problem. However, a new bridge will cost around \$1 billion. No other solutions related to active traffic management (ATM) and the application of Intelligent Transportation Systems (ITS) have been considered.

Furthermore, the research team has identified sources of existing data and collected most of the available roadway, traffic and control data required to build a simulation model for the study area. Additional high-resolution data may be required upon initial validation of the simulation results; however, the research team believes that the available data can help perform the required analysis to an acceptable accuracy. The simulation model is currently being further developed to add signal schedules and to encode the collected data.

Figure 1 identifies the top bottleneck origins/locations in the area. The majority of these bottlenecks are caused by high demand and geometric configurations that impose significant weaving movements. Solutions are currently be developed (and will soon be evaluated); the majority of solutions involve mitigating these

weaving movements through various traffic control devices/methods.

# **Impacts**

This project expected produce implementable solutions, procedures and recommendations for mitigating congestion and improving transportation system performance in the Baton Rouge area. Both supply-oriented and demand-oriented counter measures will be presented. The results of this study will help policy makers gain insight into potential solutions to the congestion problem in the Baton Rouge area and the economic feasibility of each solution.

### 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".

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For more information about Tran-SET, please visit our website, LinkedIn, Twitter, Facebook, and YouTube pages. Also, please feel free to contact Mr. Christopher Melson (Tran-SET Program Manager) directly at transet@lsu.edu.

