

## Chapter 7 Highlights: Highway Bottleneck Analysis

A freight bottleneck is defined as part of the transportation system that imposes disproportionately high costs in the movement of freight. A data-driven approach was utilized to identify truck bottlenecks on the Oklahoma National Highway System. Two performance measures were developed—average delay and reliability. In addition to evaluating performance based on measures estimated from data, the analysis considered comments from stakeholders who use the roadway network.

Delay is the difference between travel time in average conditions and free flow conditions. Delay is a planning measure for talking about recurring congestion. For businesses, delay time relates to labor costs, fuel costs, impact on driver hours of service, and other day-to-day operational factors.

Reliability is an indicator that demonstrates how bad conditions can be on a given highway segment, and is represented as the difference between speed when traveling under the worst conditions as compared to the average condition. For businesses, reliability affects supply chain activities, getting from truck to train, or truck to delivery dock. Reliability is a very important measure used by businesses to forecast on-time deliveries.

Both measures were calculated from the National Performance Management Research Data Set (NPMRDS) data and Average Annual Daily Truck Traffic (AADT) from traffic count data in Oklahoma's federal Highway Performance Monitoring System. The NPMRDS provides actual truck travel times across individual segments of the network continuously throughout the year.

As shown in the Final Truck Bottleneck by Severity analysis map, the largest number and most severe truck bottlenecks tend to cluster in the major urban areas of Tulsa and Oklahoma City due to the higher levels of congestion encountered there. The results reflect adjustments made after public review and comment. While stakeholders identified some issues that did not meet the top 5 percent threshold for serious bottlenecks (high delay or reliability problems) at the state level, those issues are important and should be considered for lower-cost solutions as appropriate.

Freight railroad and waterway mobility issues were also identified. The most common concern cited for railroads was the inability to transport standard 286,000 pound heavy axle rail cars. A significant issue for the waterway system is the critical backlog of maintenance.

