



Project Summary

Texas Department of Transportation

0-5571: Congestion Monitoring Measures and Procedures for Small to Medium-sized Communities

Background

Many Texas Department of Transportation (TxDOT) districts struggle with congestion issues in growing small to medium-sized communities (SMSCs). Congestion in these communities is often highest along the state highways that also serve their major local travel functions. While there are extensive resources and literature dedicated to measuring, monitoring, and improving large urban area congestion, there was a need for guidance for small to medium-sized communities (population less than 250,000) to better understand and alleviate congestion before the problems escalate. Potential solutions and performance measure targets are different for smaller communities than those identified in the literature for urban areas.

To this end, the primary objective of this TxDOT-sponsored project was to develop and test a framework for mobility monitoring in SMSCs, including economical (low-cost) monitoring techniques and the normal range of improvements for SMSCs.

What the Researchers Did

Researchers performed an extensive literature review of existing mobility monitoring measures, methods, and applications. A majority of the literature was from mobility monitoring in large urban areas, and researchers adapted the methods and applications to smaller communities.

The project team developed a framework for mobility monitoring in SMSCs. The framework steps include:

- identify the needs and opportunities;
- make the monitoring plan;
- monitor the system;
- analyze the data;
- package the results; and
- continue the monitoring.

Researchers applied the framework to two case study locations—a small community (less than 50,000 with no metropolitan planning organization [MPO] present), and a medium-sized community (between 100,000 and 250,000 in population with an MPO). The range in populations allowed researchers to refine the framework and methodology as appropriate.

Each case study began by researchers meeting with local transportation professionals from that community. Meeting participants discussed mobility measures, possible congestion targets, data collection needs and techniques, and possible study corridors.

Research Performed by:

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Researchers developed community-specific data collection plans and performed travel time runs, traffic counts, stopped delay studies, and videologs. Researchers measured mobility on 12 corridors in the medium-sized community (Bryan-College Station, Texas) and 2 corridors in the small community (Huntsville, Texas). Researchers collected traffic counts at 65 locations and performed 1200 travel time runs in total. Many travel time data collection techniques are available, and researchers developed cost estimates for different techniques.

Researchers developed outreach materials for technical and non-technical audiences to perform mobility monitoring in SMSCs. Researchers also developed preliminary workshop lesson plans for educating participants on the use of the product and providing technical guidance to those interested in performing mobility monitoring.

What They Found

Researchers found that:

- The measures and methods developed were successful in capturing components of mobility in SMSCs.
- The framework has been developed and refined to be applicable, and transferable, to all SMSCs.
- Travel time measures are most important to SMSCs for capturing mobility performance.
- Communication is key to the success of a mobility monitoring effort, and several communication techniques were developed for technical and non-technical audiences.
- There is significant statewide and national interest in monitoring mobility in SMSCs.

What This Means

The primary results of this research include:

- TxDOT and its partnering agencies now have numerous tested and refined resources available for mobility monitoring in SMSCs—techniques that provide a way to proactively identify and mitigate congestion difficulties before they worsen.
- The available resources are user-friendly and guide the user through the steps to ensure successful and effective monitoring.
- Technological and manual techniques are available for mobility monitoring in SMSCs, and it should not be an intimidating process—the key is to get started somewhere; process improvements can always be made in the future.
- Unit costs are available for travel time data collection techniques in SMSCs.
- Baseline mobility monitoring data and results are available for the two case study locations.
- There is a need to continue to implement the research by testing the measures and methods in additional SMSCs to refine them and begin to address mobility issues in SMSCs before they worsen.

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