Pooling Our Research: Urban Mobility Study

Why a Pooled Fund Study?
In 2010, traffic congestion in the United States caused a waste of 1.9 billion gallons of gas and 4.8 billion hours of commuters’ time. Congestion’s inflation-adjusted costs have risen from $21 billion in 1982 to $101 billion in 2010, with the average cost per commuter rising from $310 to $710. To address this problem, MnDOT and other agencies typically develop programs to alleviate congestion within transportation systems by implementing cost-effective reliability and capacity strategies. This can include providing more mobility options such as public transit.

Finding the right improvements requires that their effects on congestion be accurately measured. Measurement in turn requires not only collecting traffic data using roadside sensors, but establishing the right performance measures, which can vary depending on the goals of travelers and agencies. Average travel time between two points is typically important to travelers, but so are cost and reliability.

To help develop such performance measures and to collect and analyze the nation’s urban congestion data in the most accurate and comprehensive way possible, in 1982 the Texas Transportation Institute established the Urban Mobility Study. In 1997, the study became a pooled fund effort involving a combination of state departments of transportation, metropolitan planning organizations and the Federal Highway Administration.

What is the Pooled Fund Study’s Goal?
The study focuses on developing tools to monitor and evaluate urban congestion by identifying and evaluating the latest mobility data sources, developing and communicating comprehensive performance measures for congestion improvements and helping member agencies apply the study’s research products to their congestion planning.

What Have We Learned?
The Urban Mobility Study is nationally recognized as the leading resource for traffic congestion research. Its database has for the most part relied on historical public data and public agency sources, but in 2010 the study dramatically increased the accuracy and comprehensiveness of its congestion estimates by adding data from INRIX, a private sector company that collects traffic information from GPS-enabled vehicles and mobile devices in every major U.S. metropolitan area.

Over the years, the study has used such data, along with increasingly descriptive and relevant performance measures, to produce and update numerous resources, including:

- The Urban Mobility Report, which has been published periodically since 1984 to provide users with information about congestion problems and historical trends nationwide. The 2010 report was the first to use INRIX data, which allowed it to show trends from 1982 to 2009 for all of the United States’ 439 urban areas.
- The Keys to Estimating Mobility in Urban Areas, which outlines important mobility measurement concepts.
Twin Cities Metropolitan and MN Statewide IRC Arterial Travel Time Analysis: Use of Private Sector Traffic Speed Data, which demonstrated that private sector speed data can be a cost-effective way for monitoring and reporting mobility performance on MnDOT’s statewide network.

The study has also recently focused on developing new performance measures for freight travel and for arterial surface streets, where mobility is harder to estimate than on instrumented freeways.

What’s Going On Now?
The Urban Mobility Study is continuing to analyze the quality of emerging mobility data, including private sector sources for GPS, Bluetooth-enabled and other mobile devices; examining how the land use policies of state DOTs and metropolitan planning organizations affect congestion; evaluating affordable devices for collecting transportation data by their unit cost, life-cycle cost and effectiveness; and examining ways to communicate the benefits provided by non-capacity and short-term, lower cost projects, such as active traffic management and access management.

What’s Next?
Moving forward, the Urban Mobility Study will continue to focus on its core missions of evaluating new sources of mobility data, refining performance measures and supporting member agencies. Other efforts under consideration include:

- Developing a tool for estimating greenhouse gas benefits for roadway improvements by correlating portable emissions measurement data with speed and start-stop traffic data.
- Refining the performance measure for total travel time, which will help in calculating the mobility benefits of biking, walking and working at home.
- Evaluating the use of private sector speed data to determine what speeds should be used to represent freely flowing traffic on arterial streets, analyze issues for off-peak and weekend congestion analyses, and determine how to get reliable measures from historical archived speed data.

Study data shows that congestion impacts large and small cities, leading to 34 extra hours of commute time for the average urban automobile commuter in 2010. This data also reflects the economic recession; congestion will likely return to growth patterns seen in prior years when the recession abates.

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