

Research Spotlight

Project Information

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Reducing traffic congestion on a budget

As traffic congestion increases in Michigan and other states, mitigation strategies that improve the efficiency of transportation infrastructure or reduce demand are becoming increasingly more important. A comprehensive desk reference, *A Michigan Toolbox for Mitigating Traffic Congestion*, was created to help state and local agencies identify the most cost-effective strategies to mitigate congestion, improve mobility and make travel more reliable throughout Michigan.

Problem

In the last 20 years, infrastructure capacity in Michigan and the rest of the United States has not kept up with the demands of an increasing number of drivers and vehicles. This has led to a significant increase in traffic congestion, especially in urban areas.

With limited funding, transportation agencies are turning to a variety of mitigation strategies to cope with congestion problems, all designed to increase the efficiency of road networks or reduce demand. For example, the most common congestion mitigation strategy in the United States consists of optimizing traffic signalization by upgrading equipment or improving timing. Properly coordinated traffic lights increase the efficient flow of traffic through intersections, leading to reductions in travel times and stop-and-go driving. Alternatively, demand can be reduced by such strategies as improving bicycle and pedestrian facilities.



Traffic signal coordination is among the highly effective congestion mitigation measures included in the new toolbox. (Courtesy of FHWA.)

Not all mitigation strategies are appropriate for a given congestion problem, and choosing the right strategy can be a complex task. Consequently, there was a need for a comprehensive guide to assist state and local agencies with identifying and implementing the most cost-effective congestion mitigation strategies for their networks.

“This toolbox pulls together a wide range of congestion mitigation ideas in a single place, allowing practitioners to entertain cost-effective solutions they might not otherwise have considered.”

Jason Firman, P.E.
Project Manager

Approach

Investigators set out to develop a toolbox that can be used by state and local agencies to select suitable congestion mitigation strategies. To do so, they conducted a literature search, an online survey of metropolitan transportation organizations and interviews with Michigan transportation agency staff.

Research

Researchers began with a comprehensive literature review to identify promising congestion mitigation strategies and studies evaluating these strategies. Next, they conducted an online survey of metropolitan planning organizations throughout the country, asking about their experiences developing, planning and implementing various mitigation strategies. Finally, researchers interviewed staff from four Michigan metropolitan planning organizations about their congestion management processes.

Survey results revealed a number of congestion mitigation strategies that were highly successful, easy to implement and low-cost. The most popular strategies were adding or lengthening turn lanes at intersections, re-timing and coordinating

traffic signals, and using bike racks and improved pedestrian facilities.

Ninety percent of respondents also said they had implemented or planned to implement traffic signal equipment upgrades, transit vehicle upgrades and sidewalks. Other highly successful but more costly and difficult to implement strategies included shoulder use for part-time travel lanes and street-rail grade separations. Barriers to implementation typically included funding and public awareness, the latter making outreach an important factor in the success of many strategies.

Interviews with Michigan metropolitan planning organization staff reinforced these conclusions, with interviewees saying traffic operations improvements have the best cost-benefit ratios. These include signal re-timing, access management and minor geometric changes such as turn-lane improvements.

Results

Researchers used these results to create *A Michigan Toolbox for Mitigating Traffic Congestion*. Written in a user-friendly format, the document is meant to serve as a desk reference for practitioners and a tool to help policy makers better understand the development, planning and implementation of congestion mitigation strategies.

The toolbox presents 47 strategies organized in two categories:

- Transportation supply or system management, including traffic operations, transit, multimodal transportation centers, freight rail improvements, bicycle and pedestrian facilities, and reduced interference for construction and maintenance.
- Demand management, including work schedule changes, land use development, ridesharing and vanpools, parking management, diversified development patterns, smart growth, car-sharing and trip reduction ordinances.

Each strategy includes a detailed review

of its characteristics, techniques for implementation, data requirements, lessons learned, impacts, costs and benefits, and contact information and resources for more information. The toolbox also includes an overview of traffic congestion causes and project survey responses.

Value

Local and regional transportation agencies can apply the strategies found in the toolbox to improve mobility and travel reliability throughout Michigan. The toolbox also has the potential to provide consistency across MDOT regions and Transportation Service Centers as well as the metropolitan planning organizations, regional planning councils, counties, cities and townships that MDOT partners with.

Research Administration

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