Integrated Corridor Management (ICM) Analysis, Modeling and Simulation (AMS)

Results Show Multimodal Integration Benefits Corridors

Dallas, TX; Minneapolis, MN; and San Diego, CA could not be more different in many ways. However, they share at least one similarity: they all have congested multimodal transportation corridors. In an effort to improve travel conditions, all three of these cities are designing integrated corridor management (ICM) systems in their busiest corridors.

In 2010 stakeholders in Dallas, Minneapolis, and San Diego conducted analysis, modeling and simulation (AMS) to explore whether applying ICM strategies to a corridor could improve performance and to assess their planned ICM strategies. AMS results in all three corridors suggest that ICM will increase reliability while reducing travel time, delays, fuel consumption, and emissions. Benefit-to-cost ratios for ICM were shown to range from 10:1 to more than 20:1 over the life of the ICM system. Furthermore, the benefits of ICM appear to scale with travel demand and are especially meaningful under scenarios that unexpectedly constrain supply, such as traffic incidents.

> Benefits of ICM outpace costs by a minimum factor of 10, appear to scale with travel demand, and are especially meaningful under scenarios that unexpectedly constrain supply.

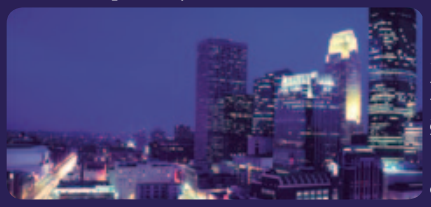
Like all urban areas across the country, the ICM AMS corridors carry millions of commuters, leisure travelers, and freight on increasingly crowded roadways and transit systems. Adding travel lanes on freeways and arterials can relieve congested roadways, but this relief is astoundingly temporary. The vision of ICM is that metropolitan areas will realize significant improvements in the efficient movement of people and goods through aggressive, proactive integration of existing infrastructure along major transportation corridors.

Dallas, TX


Source: iStockphoto.com

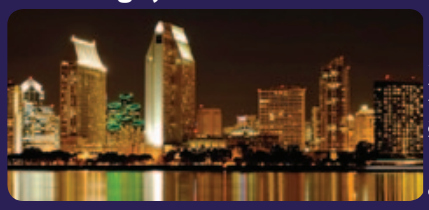
- Major employers
- No expansion capacity
- Surrounding construction planned

Minneapolis, MN


Source: iStockphoto.com

- Busy commuter corridor
- Limited expansion capacity
- Major construction planned

San Diego, CA

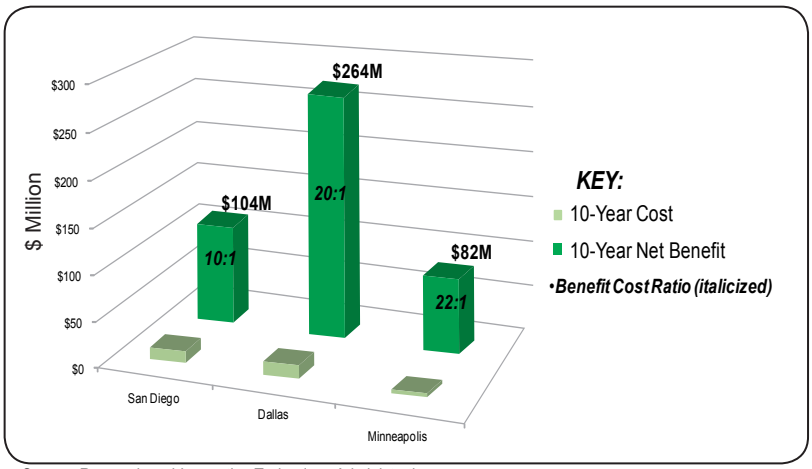

Source: iStockphoto.com

- Popular freight, tourist, and commuter corridor
- Lengthening peak travel periods

ICM AMS:

- Examined implications of ICM strategies under conditions of varying demand.
- Encompassed freeway, arterial, and transit facilities.
- Assessed effects of ICM strategies under scenarios such as special events and traffic incidents.

AMS Shows Benefits Outpace Costs of ICM Systems



Source: Research and Innovative Technology Administration

FOR MORE INFORMATION ON THE USDOT'S ICM INITIATIVE, PLEASE VISIT

www.its.dot.gov/icms/index.htm

U.S. Department of Transportation
Research and Innovative Technology Administration

About ICM AMS:

The ICM AMS Methodology is more comprehensive than traditional corridor studies, which often focus on a specific facility or area (e.g., a freeway). This is accomplished through the use of up to three classes of simulation modeling tools – macroscopic, mesoscopic, and microscopic – which permit combined analysis of regional travel patterns; specific strategies such as congestion pricing or traveler information; and localized systems such as ramp metering, respectively.

AMS helps agencies identify the optimum combinations of ICM strategies by providing a true, corridor-wide picture and saves agencies from investing in costly strategies that may not have the intended outcomes.

Pioneer Sites Followed a Common Approach with the ICM AMS Methodology

Source: Research and Innovative Technology Administration

Under the United States Department of Transportation ICM research initiative, the three ICM AMS sites investigated the potential of truly active and integrated ICM strategies such as ramp metering, congestion pricing, signal optimization, transit priority, and traveler information to enhance corridor performance in relation to five ICM performance measures: mobility, reliability, fuel savings, emissions, and benefit to cost ratio.

The sites followed a common approach, described in detail in the ***ICM AMS Guide***, a key knowledge and technology transfer resource designed to help technical program managers in transportation agencies conduct AMS. The AMS Guide complements the ICM Implementation Guide, also available, to help managers and engineers design and implement ICM. Search or browse the ICM Knowledgebase at www.its.dot.gov/icms/knowledgebase.htm to learn more.

ICM Performance Measures

Mobility:
How well the corridor moves people and freight

Reliability:
Extra "time cushion" travelers must plan for to assure on-time arrival using the corridor

Fuel Savings:
How much fuel corridor travelers save

Emissions:
Tons fewer of toxins

Benefit-Cost:
The bottom line of monetized benefits compared to costs

Source: Research and Innovative Technology Administration

Demonstration and Evaluation:

Dallas, TX and San Diego, CA are preparing to demonstrate and evaluate their ICM systems in early 2013. The effort will examine the performance measures assessed in AMS, including the benefits and costs of ICM. It will also examine the implications of traveler information in changing traveler behavior.

The vision of ICM is that metropolitan areas will realize significant improvements in the efficient movement of people and goods through aggressive, proactive integration of existing infrastructure along major transportation corridors.

Visit the ICM Knowledgebase at www.its.dot.gov/icms/knowledgebase.htm to download valuable knowledge and technology transfer materials for transportation corridor managers.

ICM AMS Helps Agencies:

- **Invest in the right strategies** by determining which combinations of strategies are likely to be most effective under which conditions.
- **Invest with confidence** because they have identified consequences that would otherwise be unknowable before implementation.
- **Improve the effectiveness/ success of implementation** because they understand in advance what questions to ask and in what level of detail.
- **Improve their implementation** of ICM continually based on experience.

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Printed on paper containing recycled post consumer waste paper

FHWA-JPO-12-044