



DEPARTMENT OF
TRANSPORTATION

RESEARCH SERVICES & LIBRARY

TECHNICAL SUMMARY

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PROJECT COST:

\$147,675



MnPASS express lanes enhance traffic operations and improve mobility.

Refined ROI Methodology Shows Added Benefits of MnPASS Lanes

What Was the Need?

MnPASS express lanes provide commuters in Minneapolis-St. Paul with a congestion-free alternative during peak rush hour traffic. The system's tolling lane projects have proved effective in relieving traffic congestion, managing ongoing increases in travel demand and maximizing the benefit of public investments.

To continue providing improved mobility throughout the region and to address anticipated increases in user traffic, MnDOT has planned to expand the MnPASS lane system by implementing additional facilities. Since the region doesn't have high-occupancy vehicle corridors that could be converted to high-occupancy toll lanes, MnDOT will have to increase capacity by adding new lanes or using existing shoulders as priced dynamic shoulder lanes. Selecting the next set of managed lanes requires careful consideration to ensure increased benefits at lower investment costs.

In the past, MnDOT had used a series of evaluation methods—cost estimation, performance measures and travel demand forecasting—to select new MnPASS corridors. While the recommendations and results from these assessments were adequate, each evaluation used a different set of objectives and assumptions. The range of benefit-cost factors in earlier evaluations was also limited to travel time savings, operating costs and crashes.

MnDOT needed a more thorough and consistent benefit-cost analysis methodology to help decision-makers better assess MnPASS project alternatives; compare potential MnPASS corridors; and communicate why MnPASS is a financially effective, long-term strategy for addressing mobility and congestion issues.

What Was Our Goal?

The goal of this project was to develop a refined, standardized methodology to more accurately assess the return on investment (ROI) of MnPASS programs and projects. A refined assessment framework would include a broader range of financial and performance measures, allowing MnDOT to more thoroughly evaluate MnPASS investments.

What Did We Do?

Using ROI as the central framework, the research team set out to generate a more comprehensive method for estimating benefits and costs. To begin, team members identified limitations in the existing benefit-cost analysis methodology and developed a list of factors to include in the refinement process. Then they interviewed stakeholders from various agencies to better understand MnPASS planning and operations needs, as well as the data required to support the research and system benefits and costs.

Next, they began to develop the enhanced framework by defining economic, environmental and social ROI categories for MnPASS investments, and mapping the relationship between these categories and their associated benefits and costs. Benefit-cost analysis methods then were used to build the refined framework and to estimate benefit-cost

Researchers developed a new method for evaluating the benefits of MnPASS managed lane projects based on return on investment and benefit-cost analysis. The new, refined method shows that MnPASS projects have more positive impacts than previously identified.

“Our previous corridor studies each had different benefit–cost elements, making direct comparisons difficult. This project makes it possible to quantify the transit, environment and travel time reliability benefits that we knew were there all along.”

—John Wilson,
Economic Policy Analyst,
MnDOT Office of
Transportation System
Management

“Benefit–cost analysis had not changed for a long time; we had looked at travel time, vehicle operating costs and safety. Now we have added travel time reliability, which is important because we are moving people, not just vehicles.”

—Paul Morris,
Senior Associate, SRF
Consulting Group, Inc.

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MnPASS express lanes keep traffic moving, even during peak travel times. Overhead signs explain who may use the lane during peak travel time.

ratios for projects. Finally, researchers applied the new framework to an earlier benefit–cost analysis of the Interstate 35 West (I-35W) North Managed Lanes project to compare the results of the new framework with the results from the earlier analysis.

What Did We Learn?

Researchers used additional benefit factors such as transit use, travel time reliability, emissions and noise to refine the ROI calculation methods. When they applied the new ROI framework to the I-35W project, they found that the MnPASS benefit–cost ratio significantly improves with the inclusion of transit and travel time reliability benefits.

What's Next?

The results from the comparative analysis yielded a notably higher benefit–cost ratio of 3.40 for the test corridor compared to a benefit–cost ratio of 2.11 in the original study, indicating that MnPASS projects have more positive effects than previously identified. Based on these findings, MnDOT will revise its benefit–cost guidance for evaluating MnPASS investments.

The research team was also able to measure the impacts of specific categories on the overall outcome of the calculations. Team members found that while the measures for reliability and transit impacts produced a meaningful change in the overall benefits, those for emergency response, emissions and noise impacts were very small relative to overall project costs. MnDOT will consider these findings in establishing updated procedures.

This Technical Summary pertains to Report 2017-37, “Refining Return on Investment Methodology/Tool for MnPASS,” published October 2017. The full report can be accessed at mndot.gov/research/reports/2017/201737.pdf.