

I-94 St. Croix River Bridge

Wisconsin to Minnesota | Bridge Redecking



ROAD ZIPPER™

I-94 St. Croix River Bridge

CASE STUDY
FOR CONSTRUCTION

Moveable Barrier Significantly Reduces User Delay Costs

The Quickchange® Moveable Barrier System (QMB®) allowed the Wisconsin Department of Transportation (WisDOT) to complete a redecking project on the westbound span of the St. Croix River Bridge in one construction season, in contrast to the two seasons it would have taken using traditional construction methods.

“The biggest challenge was maintaining smooth traffic flow during the six months of construction when only one five-lane bridge was open,” said Andrew Dana, P.E., the final design engineer for Ayres Associates, the company hired by WisDOT to figure out the logistics of the project. The majority of the vehicles traveling on I-94 over the St. Croix bridges are commuting from the Hudson area in Wisconsin to the Twin Cities in Minnesota. Approximately two-thirds of the morning peak traffic (4,045 vehicles per hour) travel on the westbound lanes, and about two-thirds of the afternoon peak traffic (4,907 vehicles per hour) travel on the eastbound

lanes. Anderson approximated, “On that stretch of road we have 70,000 cars a day.”

For every hour someone is sitting in a vehicle waiting, engineers assign a dollar amount in user-delay costs. This includes things like lost work time and the amount of fuel burned by idling vehicles. Dana explained, “Going into this project, we projected the user-delay costs could be in the millions of dollars. So to minimize that we really needed to come up with a way to keep three lanes open in the primary direction of traffic at all times.”

Utilizing QMB technology allowed contractors to quickly move the segmented concrete barrier that divided traffic on the eastbound bridge while the adjacent westbound bridge was being redecked. The added capacity reduced user-delay costs from a projected \$1.8 million to \$480,000. Twice each day at about 10 a.m. and 8 p.m. 4,916 feet of concrete barriers were moved in about half an hour, maintaining

three lanes with an average speed of 51 mph open in the direction of highest traffic volume at all times. Throughout the project, the typical rush-hour commuter had only five to ten minutes added to their normal travel time. “It could have easily turned into an extra 40 minutes in delays if we would have had the barriers fixed in one location,” said Dana.

Staci Mick, the construction site engineer for Ayres Associates who was on site throughout the six months of construction, agreed that the multi-million dollar project went very smoothly. The renovated bridge opened to traffic one month ahead of schedule and according to Ayres Associates, the estimated construction cost savings for using the QMB™ was between \$1,000,000 and \$1,500,000. “The state of Wisconsin was very pleased with the project,” Anderson said. “There were no major accidents. It was completed on time. That’s exactly what we wanted.”



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