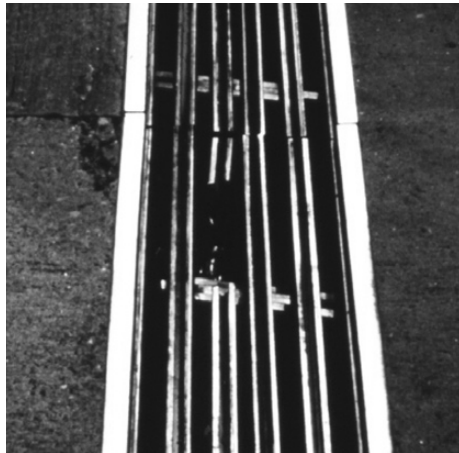


# National standards raise the bar for bridge joints

“Doing it right costs money. Doing it wrong costs more.” Just ask Texas DOT, which had to repair the modular bridge joint systems on its expansive Houston Ship Channel Bridge.



Premature MBJS deterioration

Implemented correctly, modular bridge joint systems, or MBJS, can accommodate significant expansion and contraction between bridge decks while minimizing the leaking of corrosive liquids onto the bridge beams and substructure. However, if the systems are poorly designed, specified, or installed—which sometimes happened in the past due to a lack of national specifications—they can underperform and result in costly bridge damage and premature joint replacement.

“The repair of the MBJS was quite costly, but would have been much more costly if not done correctly.”

## A Texas-sized order

TxDOT was just one beneficiary of an NCHRP research project that tackled this problem head-on. NCHRP Project 10-52 resulted in Report 467, *Performance Testing for Modular Bridge Joint Systems*, authored by researchers from the University of Minnesota. Published in 2002, this report provided performance requirements for MBJS as well as test methods and equipment for their prequalification and acceptance.

The performance requirements include tests to simulate conditions that cause failures in the field, such as traffic loading and vertical

push-out forces, and help eliminate problems related to poor design, component durability, and installation. Report 467, in tandem with NCHRP Report 402, *Fatigue Design of Modular Bridge Expansion Joints*, helped change AASHTO’s LRFD Bridge Design Specifications (now in their fourth edition) and LRFD Bridge Construction Specifications (in their second edition).

TxDOT relied on the results of this study to repair the bridge joints on Houston’s iconic Ship Channel Bridge. “The repair of the MBJS was quite costly,” says Mark Blosscock, formerly of TxDOT, “but would have been much more costly if not done correctly.” The more robust replacement MBJS meet the new standards and are operating without incident, reports TxDOT bridge division director Randy Cox.

## Both innovation and performance

The benefits span the nation. Ralph Anderson, Illinois DOT’s bridges and structures bureau chief, described the value of this research from the states’ perspective. The chair of AASHTO’s Technical Committee for Bearings and Expansion Devices, Anderson says that “the bridge world is supportive and appreciative of NCHRP and this research. Bridge owners have limited resources, and the performance requirements that came out of this study provide confidence that modular deck joints will perform the way they’re intended to.

“At the same time,” says Anderson, “cooperative national research makes it feasible for manufacturers to innovate and design toward one set of national specifications, rather than having each state heading off in a separate direction.” Anderson says that state DOTs

welcome innovation and improvement, as long as their performance needs can still be met.

## Built to last

Minnesota is another state that has incorporated all of the recommendations from Report 467 into its special provisions for MBJS. Bridge design unit leader Arlen Ottman at Minnesota DOT said that all MBJS in Minnesota must conform to these standards. This includes systems put into new bridge

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construction and replacement systems alike. “Before these specifications,” Ottman says, “we never knew if we were getting what we needed or how long these systems would last. This report helped ensure quality for a bridge part that should be built to perform for decades, and at least as long as the other components of the bridge deck.”

Bridge designers and owners can review NCHRP Report 467 on TRB’s Web site at [http://www.trb.org/news/blurb\\_detail.asp?id=691](http://www.trb.org/news/blurb_detail.asp?id=691) and order a hard copy from the TRB Bookstore at <http://www.trb.org/bookstore/>.



Houston’s Ship Channel Bridge

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