



Iowa Department
of Transportation

Research at **Work** at the Iowa DOT

The Iowa DOT innovates—and delivers—using NCHRP research



Guided by NCHRP research, the Iowa DOT saves time and money by using prefabricated bridge components.

The Iowa Department of Transportation is committed to getting full value out of research, whatever its source, to help improve the state's transportation system. "Successful implementation of research requires a shared attitude—an institutional mind-set that we're always working toward," says Sandra Larson, director of the Iowa DOT's Research and Technology Bureau.

Just how critical is it to the Iowa DOT to put research results into practice? "We recently instituted the position of implementation engineer—a dedicated staff member whose primary role is helping us find and use research to innovate practices and continuously deliver a better transportation system," says Larson.

While the Iowa DOT makes extensive use of state-driven research to help address local challenges, looking beyond the state's borders is equally important. The Iowa DOT seeks to implement applicable research wherever it can be found, whether from neighboring states, the Transportation Pooled Fund Program or the National Coopera-

tive Highway Research Program (NCHRP) that the Iowa DOT voluntarily funds.

"Our state is an active participant in NCHRP," Larson says, "and we make the most of our investment by putting NCHRP research to work, especially in high-priority areas." A few examples from three of these areas—structures, safety and winter maintenance—help tell the story of how the Iowa DOT uses NCHRP results to get the job done.

"We recently instituted the position of implementation engineer—a dedicated staff member whose primary role is helping us find and use research to innovate practices and continuously deliver a better transportation system."

Bridges and Structures

To stay on the cutting edge of bridge technology, Iowa uses accelerated construction techniques and advanced designs and construction materials. Jim Nelson, final bridge design section leader of the

Iowa DOT's Office of Bridges and Structures, frequently draws upon NCHRP research results to support the state's efforts. "NCHRP publications do a good job of presenting information that can be used by engineers," he says. "Over the last several years, I have saved and referred to a dozen or more of these publications."

For example, Iowa engineers used *NCHRP Report 584: Full-Depth Precast Concrete Bridge Deck Panel Systems* as a reference for the agency's federally funded prefabricated bridge projects in Boone County and Council Bluffs. "The report had good documentation on lessons learned from other projects, especially in relation to the component connections," says Nelson.

NCHRP Synthesis Report 324: Prefabricated Bridge Elements and Systems to Limit Traffic Disruption During Construction had similar value to the Iowa DOT: "Synthesis Report 324 was an important reference for our accelerated bridge construction projects, most recently U.S. 6 over Keg Creek in Pottawattamie County," he says. Funded in part by both the Strategic Highway Research Program 2 and FHWA's Highways for LIFE program, the Keg Creek bridge is a landmark demonstration helping prove first-of-their-kind construction techniques for ultra high-performance concrete.



Courtesy of city of Clive

The Iowa DOT has incorporated findings from other NCHRP reports in its bridge projects, including *NCHRP Synthesis Report 345: Steel Bridge Erection Practices* and *NCHRP Report 503: Application of Fiber Reinforced Polymer Composites to the Highway Infrastructure*.

Traffic and Safety

The Iowa DOT is always looking for ways to improve safety, and Jeremy Vortherms, state traffic safety engineer of the Office of Traffic and Safety, keeps many NCHRP reports within easy reach. “I often turn to these when particularly challenging problems arise that our standard practices cannot address,” he says. “They give us a good idea of what the best practices are nationwide and provide a rich source of ideas for us to consider.” Among the reports at Vortherms’ fingertips are the *NCHRP Report 500* guides—a series covering a range of user, vehicle and highway safety factors.

Other NCHRP publications help the Iowa DOT address such topics as pavement markings and intersection design. Deanna Maifield, methods engineer of the Office of Design, cites *NCHRP Report 672: Roundabouts: An Informational Guide* as an example. “Our staff frequently references *Report 672* as we develop state safety and design standards for roundabouts,” she says. “We’ll use this as a starting point and training tool.”

To help support overall institutional commitment to safety, the Iowa DOT has used *NCHRP Report 667: Model Curriculum for Highway Safety Core Competencies* to strengthen highway designers’ understanding of highway safety principles and help them improve how they integrate safety into the design process.

Winter maintenance

Having partnered in Transportation Pooled Fund snow and ice research for years, Iowa knows the value of cooperative state research for winter maintenance. The agency similarly looks to NCHRP research products to address winter maintenance challenges. Bob Younie, Iowa’s state maintenance engineer, says, “There are so many NCHRP reports that have so much value to the Iowa DOT. You’ll probably hear that same answer no matter who you ask.”

Indeed, Leland Smithson, formerly with the Iowa DOT and now the Snow and Ice Pooled Fund Cooperative Program coordinator for the American Association of State Highway and Transportation Officials (AASHTO), can name several examples, including *NCHRP Report 577: Guidelines for the Selection of Snow and Ice Control Materials to Mitigate Environmental Impacts* and the Material Selection Decision Tool software developed from that

“Our staff frequently references *Report 672* as we develop state safety and design standards for roundabouts.”

research. “Although Iowa mainly uses salt for snow and ice control, if the Iowa DOT needs to consider other chemicals, this is the reference the agency turns to,” Smithson says. “*Report 577* and the user-friendly software decision tool together help public and private agencies consider impacts to the receiving environment as they weigh their snow and ice control options.”

Cooperative research works in two directions. As much as Iowa makes use of NCHRP research, it gives back to the other states. Consider how Iowa helped implement the results of NCHRP Project 6-17, “Performance Measures for Snow and Ice Control Operations.” Smithson was part of the team that developed the findings into AASHTO’s *Winter Roadway Maintenance Computer-Based Training* suite. “A team of technical experts and trainers worked to simplify the research results and help convey very technical information in a user-friendly way,” Smithson says. It’s a textbook example of how the Iowa DOT makes the most of NCHRP research to advance state of practice and improve its transportation system.



AASHTO’s Winter Roadway Maintenance Computer-Based Training suite. (Image courtesy of AASHTO)

For more information, please contact the Iowa DOT’s Research and Technology Bureau, www.iowadot.gov/research.