



RESEARCH
SERVICES SECTION

**TECHNICAL
SUMMARY**

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Principal Investigators:

Timothy Clyne, Mn/DOT
David M. Johnson, P.E., Consultant

PROJECT COST:
\$60,000

Project	Purpose	Contact
40 Year Old PCC Pavement Performance	To track the performance of old concrete pavement sections	Bernard Bevebeloh, MnDOT Road Research
40 Year PCC	Test Sections built to observe variables that effect long term performance of concrete pavements	Tom Birkman, MnDOT Road Research
Asphalt Concrete Hot Density Spec.	Track asphalt paving projects that contained density specification and using for longitudinal construction joint	John Hagen, MnDOT Dist. 7 Materials Eng.
Asphalt Concrete Hot Density Spec.	Track asphalt paving projects that placed scales at longitudinal construction joints	John Hagen, MnDOT Dist. 7 Materials Eng.
Asphalt Core Thickness	Laboratory measurement of cores from state projects	John Curry, MnDOT Office of Materials
Asphalt Overlay Lift Thickness	To determine if lift thickness (and resulting density) differences affect asphalt overlay performance	John Hagen, MnDOT Dist. 7 Materials Eng.
Asphalt Overlay Lift Thickness	To determine if lift thickness (and resulting density) differences affect asphalt overlay performance	Mike Lovvorn

The database groups test sections by project. The Research Study Groups page describes each project and allows users to update data online.



Minnesota's Transportation Research Test Section Database

What Need Did We See?

Each year, researchers throughout Minnesota create roadway test sections to evaluate new pavement materials, construction techniques and other innovations. Hundreds of test sections have been created, related to every aspect of roadway design. They may be part of formal research projects, or they may be ad hoc tests of new products or procedures. Due to the distributed nature of transportation research, not all projects may reach those who are doing similar work. This can result in duplicated effort.

Because the use of test sections goes back decades, follow-up can be a challenge. As individuals change jobs, retire or move on to other projects, monitoring of test sections can cease, and the data gathered may be lost to the transportation research community. The most valuable test sections for research purposes are in fact those most likely to be lost: Sections installed many years ago allow researchers to measure long-term pavement performance.

What Was Our Goal?

Objectives for this project included:

- Creating a Web-accessible database for tracking test sections
- Populating this database with validated data about existing test sections
- Assisting state, county and city engineers in using and entering data
- Publicizing the system to potential state, county and city users through presentations and marketing materials

What Did We Do?

In 2003, Mn/DOT and LRRB initiated a five-year project to fulfill these objectives. By 2004, researchers at Mn/DOT's Office of Materials, Road Research Division, had created and begun to populate a database that records each test section's project name, purpose and location, as well as a contact name and comments about the project. This database was made available for queries, reporting and updates at <http://www.mrr.dot.state.mn.us/research/tracking/tracking.asp>.

In November 2006, investigators determined that a major database population effort by additional staff was needed for the database to fulfill its function. This resulted in a sub-contract for data collection and entry that ran through the following year. A consultant added information from numerous sources, including:

- A mainframe database created in 1989 that included data extending back to the 1930s
- Mn/DOT and LRRB research (current and completed) that included test sections
- Information from local transportation agencies, contacted by e-mail and phone, including 49 counties, 21 cities, 49 Mn/DOT staff, and 10 academic or private sector contacts

The consultant supplemented incomplete data and checked the validity of test sections via follow-up contacts, roadway history files and other sources. He created training materials and presented the system to city, county and Mn/DOT district users in several meetings throughout the state.

What Did We Learn?

As of March 2008, the database contained 1,896 test sections categorized into 97 topic groups, including a considerable number of older test sections. The consultant produced

“Each test site that was identified and added to the database represented a significant financial investment that we didn’t want to lose, and also a significant opportunity to learn from in the future.”

–David M. Johnson,
Engineering Consultant

“To gain acceptance with city and county engineers, the database has to be simple to navigate and needs to be publicized regularly. If they start using it for research, they’ll see it’s also available for them to enter in their own test sections.”

–Lou Tasa,
Mn/DOT District State Aid
Engineer

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The Test Site Tracking System provides current researchers with awareness of test sections like this one, installed in 1996 to monitor State Highway 72 north of Waskish and help determine its future design.

a set of recommendations for improving the database and its user interface and for ensuring that the database is robust. These included:

- Annual evaluation of test sections in the database to address topics of current interest to the department
- Expansion of the database to include additional topics such as flashing stop signs and weed control effectiveness
- Modifications to simplify and streamline the user interface
- Expanded database search capabilities on the Web site
- Added capabilities for tracking the usage of the database and Web site
- Addition of references and links to related reports
- An increase in data checks such as drop-down menus to ensure database integrity
- Other measures to increase data security and accessibility

What’s Next?

The five-year project originally envisioned will last through the end of 2008, and LRRB is considering funding an additional five years. Office of Materials staff members continue to locate and enter test sections at a constant rate, and a yearly audit of current Minnesota research will ensure that newly created test sections are captured.

Immediate plans to improve the system involve improving the Web site design, making entry forms easier to use, and otherwise smoothing the operation of the database. Longer-term plans include implementing many of the suggestions listed above, along with:

- Adding GIS/GPS functionality to allow all sections to be displayed to users on a map; this will allow many of the sections to be located much more precisely
- Additional data capture, such as project reports and site pictures
- Enhanced database search capabilities
- Interfacing the database with existing Minnesota performance management databases, which would allow users to quickly access pavement performance data

A primary recommendation of the project’s final report is to perform on-site evaluations of more of the test sections that have been discovered, both to collect performance data about these sections and to spur research efforts that take advantage of their existence. Outreach efforts will also continue to publicize the database to new and experienced engineers and educate them on its use. The key principle going forward remains to help Minnesota maximize the investments that have been made in test sections so as to spur roadway innovations that result in higher-quality, longer-lasting roads that save taxpayer dollars.

This Technical Summary pertains to the LRRB-produced Report 2007-39, “Populating Minnesota’s Transportation Research Site Database,” published October 2007. The full report can be accessed at <http://www.lrrb.org/pdf/200739.pdf>. The database described can be accessed at <http://www.mrr.dot.state.mn.us/research/tracking/tracking.asp>.