In June, the MnROAD road research facility begins construction on its third phase of research since 1994, the first time it’s rebuilt in partnership with other states.

Dozens of new experiments are planned along MnROAD’s test tracks in rural Albertville: 3.5-mile sections of Interstate-94 (mainline and bypass) and an adjacent 2.5-mile low-volume closed road. Six states and numerous industry partners formed the new National Road Research Alliance (NRRA) to co-sponsor reconstruction at Minnesota’s accelerated test track.

NRRA-prioritized research will support state and local needs, including effective use of fiber-reinforced concrete, asphalt overlays of concrete pavements, cold central plant recycling and concrete partial depth repairs to name a few.

“The advantage of having these test sections at MnROAD is we can take bigger risks and push the envelope in terms of mix designs and layer thicknesses for both asphalt and concrete layers that could not be done on a public roadway,” Research Operations Engineer, Dave Van Deusen said.

Stay up-to-date on construction by signing up for email alerts at mndot.gov/mnroad. A complete summary of planned research is available at mntransportationresearch.org.

Other states are joining with MnDOT to reconstruct many of the test cells at the MnROAD pavement test track in order to evaluate different pavement types and preservation techniques under live traffic.

Road Research Breaks New Ground

National Pavement Conference in Minnesota May 23-24

Find out about the latest in road research at the National Road Research Alliance Pavement Workshop and Conference, hosted by MnDOT May 23-24.

Tour MnROAD and get practical information on pavement design, construction, rehabilitation and maintenance. Learn more at mndot.gov/mnroad/nrra/pavementconference.
Wearable GPS Receiver Improves Worker Safety

TRAFFIC & SAFETY — Drivers aren’t the only threat to worker safety. Construction vehicles themselves can be a hazard. Global Positioning System (GPS) receivers embedded in worker safety vests can show vehicle operators exactly where workers are located relative to construction equipment. If workers aren’t present, the system could automatically raise the work zone speed limit. A prototype of the system appears promising, but more work is needed to improve its directional accuracy. The 1-inch-thick GPS receivers also need to be scaled down to be practicable.

TECHNICAL SUMMARY 2016-27

Smartphone App Prototype Notifies Drivers of Work Zones

TRAFFIC & SAFETY — Technology is being used more frequently in highway work zones to reduce traffic-related injuries and increase worker safety. Recently researchers developed a system that uses Bluetooth low energy (BLE) tags to send wireless signals to drivers’ smartphones as vehicles approach a work zone. A smartphone app regularly updates work zone locations on the phone, and when a vehicle nears a work zone, the app scans for a BLE tag set up at the site. In prototype testing, the app successfully detected a signal from 125 meters away when the vehicle was traveling at highway speeds, and in one case detected a signal at 281 meters.

“This was a proof of concept that showed that smartphones can receive Bluetooth signals at highway speeds and deliver messages to drivers. Future research will look into how we should implement and maintain a driver alert system.”

—Ken Johnson, Work Zone, Pavement Marking and Traffic Devices Engineer, MnDOT Office of Traffic, Safety and Technology

TECHNICAL SUMMARY 2016-38
Full-Depth Reclamation More Cost Effective Than Mill-And-Overlay for Local Roads

MATERIALS & CONSTRUCTION — Full-depth reclamation (FDR) requires trains of equipment to pulverize, lift, grind, remix and repave asphalt roads. Old pavement materials are recycled and used in the new pavement without ever leaving the site. To encourage broader use of this environmentally friendly and resource-saving practice, investigators used laboratory and computer simulations to show its effectiveness when compared to other road rehabilitation options for suburban/urban and local road application. Further research is still needed to create new specifications for optimal use of this technique.

Nondestructive Test Promises Better Pavement Data

MATERIALS & CONSTRUCTION — Slab thickness is a key feature in pavement performance. Thinner slabs may be prone to damage while slabs that are too thick may waste materials. That’s why contractors always measure thickness during construction, usually by cutting cores out of the pavement. But using ultrasonic testing to measure thickness is not only less destructive, it provides for a quicker, more accurate test to use during construction. The method also yields much more data about the pavement, helping road agencies to predict when and how cracking might occur.

Boring Data Now Available on Mobile Devices

BRIDGE & STRUCTURE — Designing a road often requires evaluation of soil and rock properties on-site, which can cost thousand of dollars per test. Using data from past projects is more efficient than redoing tests. To this end, MnDOT put historical boring data from more than 35,000 tests since 1959 (the Foundation Borings Database) online in 2003.

The database’s web application has now been modernized. It’s more mobile-friendly and engineers can use Google Maps to access the data. Users can also search for data by dozens of parameters, allowing them to look at features of similar projects.

Developers also created GeoApp, a smartphone application, for easy access to the database. An early Android version is available on the Google Play store and an iOS-version is underway. Until it’s complete, access data at mndot.gov/materials/gi5splash.html.

Transportation Research Synthesis

A Transportation Research Synthesis (TRS) is a short-term research project that summarizes research activity and current state of the practice. To view TRSs or request one to address your research need, visit mndot.gov/research/TRS.html.

What Happens to Unspent Metropolitan Planning Funds?

POLICY & PLANNING — Since 1962, metropolitan planning organizations (MPOs) have served as a crucial tie between federal transportation funding and local priorities. But sometimes MPOs don’t use all of the federal funds within a fiscal year. Before changing its practices for carrying over funds to future years, MnDOT wanted to know how other states manage these funds. Investigators surveyed selected state departments of transportation (DOTs) to gather information about the advantages and drawbacks of their practices.

“Managing unspent MPO planning funds is a challenge faced by many DOTs,” said Bobbi Retzlaff, planning program coordinator in MnDOT’s Office of Transportation System Management. “Each state is different, with a policy tailored to its specific needs. The examples cited in this project will provide background as we update our policy.”

LRRB Revamps Website

Looking for research and other resources related to local transportation issues? The Minnesota Local Road Research Board’s newly redesigned website offers many helpful products and tools for transportation practitioners. In addition to a new look, the website also has a new search engine for projects. Check out the website at lrrb.org!
Calendar

4/19  MnDOT Environmental Stewardship Conference, University of Minnesota

4/24  Abstracts due for CTS Transportation Research Conference


5/23-24  National Road Research Alliance Pavement Workshop & Conference, Albertville and St. Paul

6/28-29  Local Road Research Board meeting, Grand Rapids

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Due May 18
Submit Your Research Ideas

Got a need? MnDOT and the Local Road Research Board are collecting research ideas for FY2019 funding. Submit your idea at mndot-lrrb.ideascale.com.