RESEARCH SERVICES & LIBRARY

January-March 2017

DEPARTMENT OF TRANSPORTATION

ACCELERATOR

mndot.gov/research

Putting your ideas in motion

Two related studies will investigate what can be done to prepare local infrastructure for connected vehicle technologies, such as vehicle-to-infrastructure (V2I) and vehicle-to-vehicle (V2V). (USDOT illustration)

Newly Funded Studies to Tackle Big Questions in Transportation Industry

Can Twin Cities roadsides be used to grow habitat for endangered bumble bees? Are unseen factors affecting safety at rural intersections? How should Minnesota transportation agencies be preparing for connected vehicle technology?

Minnesota's next round of transportation research projects will attempt to solve these and other questions facing the state's transportation community. The Transportation Research and Investment Group, which governs MnDOT's research program, and the Minnesota Local Road Research Board, which represents cities and counties, recently met and selected 21 transportation research projects for funding in fiscal year 2018.

A couple of MnDOT's most interesting projects will evaluate the reuse of wastewater at safety rest areas and truck stations and develop a system to optimize the location of 80 truck stations due for replacement in the next 20 years. MnDOT will also partner with the Local Road Research Board to evaluate the use of personal warning sensors for road construction workers.

In addition to the problem of stripping underneath sealcoats on some city streets, top research projects for local governments involve pedestrian safety enforcement and investigating whether rural, low-volume roads should be treated differently than urban roads for stormwater runoff. Current regulations govern runoff the same, regardless of daily vehicle count or surrounding land use.

"The selected research studies, which typically take one to three years to complete, will address some of the most major policy, environmental and maintenance dilemmas facing transportation practitioners," said Linda Taylor, director of MnDOT Research Services & Library.

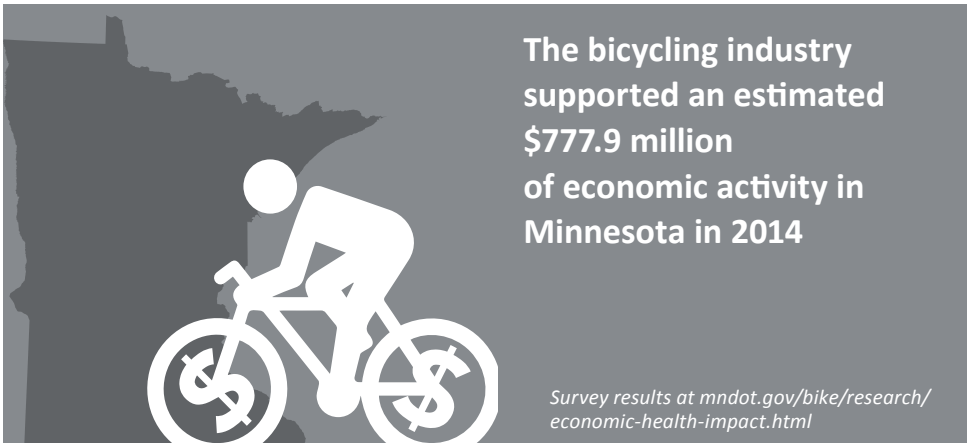
See a full list of the projects with links to associated need statements on our blog: mntransportationresearch.org.

Quantifying the Benefits of Cycling

MULTIMODAL—MnDOT research has provided the first in-depth assessment of the impacts of bicycling in Minnesota. Data was gathered on the following benefits of bicycling, which will help transportation planners recommend investments that maximize the benefits:

- Economic impact of bicycling industry
- Volume of bicycling infrastructure/facilities use
- Economic impact of bicycling events
- Health benefits of bicycle commuting

TECHNICAL SUMMARY 2016-36



In 2015, the average bicycle event visitor spent

$121.20 PER DAY

Major expenses were event fees, lodging and dining out

Bicycle industry supported

5,519

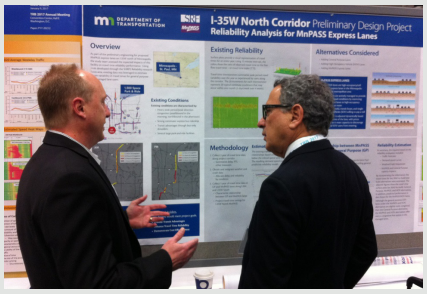
employees in 2014

Health benefits of bicycle commuting: prevents

12 to 61

deaths per year

MnDOT Shares Lessons



More than 20 MnDOT employees were invited to share their knowledge in Washington, D.C. in early January, delivering presentations and conducting meetings at the Transportation Research Board's Annual Meeting, the nation's preeminent transportation conference.

MnDOT staff presented on a wide-range of topics, from 3-D ground-penetrating radar for pavement evaluation to drone inspection of bridges. The event drew approximately 12,000 transportation practitioners from around the world.

How Can MnDOT Meet the Transportation Needs of Millennials in Rural Areas?

POLICY & PLANNING—Millennials are currently the largest generation in the United States, so understanding their transportation needs and preferences is necessary to effectively plan the transportation network. While a national report already provided useful information about urban millennials, more data was needed about those living in rural and small urban areas.

MnDOT collaborated with Wisconsin, Montana and Washington transportation agencies to fund an online and telephone survey of more than 2,500 respondents, including 625 from Minnesota.

The survey asked about:

- **Use of and interest in automobiles versus other kinds of travel.** The study found rural millennials are less interested in nonautomotive travel than their urban counterparts.
- **Preferred ways of receiving travel information.** Smartphones were the favorite, though less so in rural areas due to gaps in wireless coverage

- **Additional transportation facilities.** Respondents north of the Twin Cities on the Wisconsin border wanted additional public transportation, while central Minnesota residents near St. Cloud expressed interest in more bicycling infrastructure.

TECHNICAL SUMMARY 2016-35

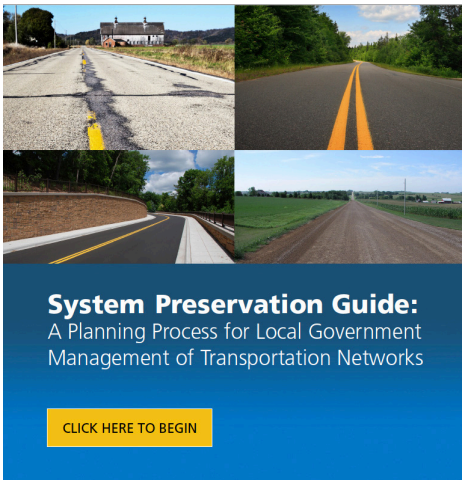
Interactive Guide Helps Local Agencies Address Maintenance Funding Gaps

POLICY & PLANNING—Minnesota local agencies often do not have enough funding to keep their entire transportation infrastructure in good repair.

The Minnesota Local Road Research Board has funded a new guide that helps agencies evaluate their preservation needs, communicate these needs with elected officials and the public, and select and implement strategies to address the funding gaps.

Using the process presented in the guide, five pilot counties—Anoka, Stearms, Freeborn, Otter Tail and Dakota—built consensus among the public and elected officials to implement either a sales tax or wheelage tax to increase maintenance funding.

Each county also selected other strategies to address its funding shortfalls, such as changing the maintenance classifications of certain roads or even converting them to gravel, developing



new transportation plans or project prioritization methodologies, and using longer life-cycle maintenance and cost reduction techniques.

Keep an eye out for training and other resources planned to help agencies implement this guide.

TECHNICAL SUMMARY 2016-34

Moving Local Road Design, Construction to Digital World

POLICY & PLANNING— Even the simplest of transportation projects involve numerous drawings, specifications and contracts.

A new research project identifies best practices in modernizing this process using 3-D modeled digital construction plans, electronic documentation management systems and other strategies, collectively referred to as Civil Integrated Management (CIM).

Investigators interviewed county engineers and state departments of transportation, reviewed case studies and held a brainstorming session to assess the benefits of these technologies and provide guidelines for local engineers.

Fully implementing these technologies into Minnesota practice will likely be a long process. The Local Road Research Board is currently evaluating next steps, which may include cost-benefit analyses, developing standard process documents or implementing a pilot project.

TECHNICAL SUMMARY 2016-29

Reducing ROW Costs, Delays

POLICY & PLANNING—Acquiring land through eminent domain for transportation projects can be expensive. A study evaluated barriers that increase costs and delays in acquiring rights of way (ROWs), and developed 25 recommendations to overcome those barriers.

A survey of ROW professionals identified the most severe barriers as property owners' distrust of the agency, poor communication with property owners, and lack of knowledge and experience among agency staff.

Many of the study's recommendations would involve new legislation, such as limiting awards of attorney's fees. But many can be directly implemented by local agencies, such as getting ROW agents involved in the early stages of a project, establishing incentives for property owners to settle early, arranging one-on-one meetings with property owners to build trust, and providing continuous cross-training for ROW staff.

TECHNICAL SUMMARY 2016-28

GeoApp Provides Mobile Access to Decades of Geotechnical Data

With GeoApp and a mobile device's touchscreen and GPS functionality, engineers can remotely access geotechnical data from the Foundation Borings Database.

MATERIALS & CONSTRUCTION—Designing a road often requires evaluation of soil and rock properties on-site, which can cost several thousand dollars for each test. However, MnDOT has collected data from more than 35,000 tests since 1959 (the Foundation Borings Database), and that kind of data generally doesn't change much over time. Accessing this information is faster, more economical and safer than redoing tests.

With GeoApp, an Android-based mobile device app, engineers can access the database using Google Maps to find data about a desired location. Users can also search for data by dozens of parameters, allowing engineers to look at features of similar projects.

Developers are creating an iOS app. Until that app is available, users can access data through MnDOT's website.

TECHNICAL SUMMARY 2016-26

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Putting your ideas in motion

Calendar

3/1-2	Minnesota Transportation Conference, St. Paul
3/9-10	2017 CPAM Concrete Paving Workshop, Mankato
3/13	LRRB-RIC Meeting, MnROAD
3/23	LRRB Meeting, Golden Valley
4/4	TRIG Meeting, Arden Hills
4/9-13	National Association of County Engineers Convention, Ohio

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