MnDOT Pedestrian and Bicycle Scoping

Sonja Piper, PE | MnDOT Bicycle & Pedestrian Safety Engineer

Pamela Fincher, PTP & Maria Donnelly, PE, PTOE | HNTB

In each issue, the INCITER features an article coordinated by one of NCITE’s technical committees. This article is a contribution from the Pedestrian and Traffic Safety Committee.

The Minnesota Department of Transportation (MnDOT) has a mission and vision that includes a multi-modal transportation system. HNTB, in partnership with MnDOT’s Office of Traffic Engineering, is conducting bicycle and pedestrian scoping field walks for the greater MN Districts to provide recommendations for inclusion of meaningful bicycle and pedestrian engineering solutions in MnDOT projects. The long-term program goal is to better position bicycle and pedestrian recommendations within project development, particularly recommendations with additional costs. Recommendations promote walking and biking for Minnesotans as modes of transportation and include improvements such as safety countermeasures, safer crossings, network completion, and innovative treatments.

Pedestrian and bicycle scoping field walks are being performed for the greater MN Districts. The walks are conducted separately and in addition to MnDOT ADA field walks. MnDOT will continue conducting the ADA field walks, which focus primarily on compliance, constructability, and occasionally small network gaps up to one block. The new pedestrian and bicycle scoping recommendations fill the void of network connectivity, review needs for bicycling infrastructure and plan for the future non-motorized transportation system. A bicycle and pedestrian scoping recommendation report is provided to the project manager to be considered during project scoping based on the scoping decisions.

A GIS-based spatial analysis tool — Suitability of the Pedestrian and Cycling Environment (SPACE)
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<thead>
<tr>
<th>Position</th>
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<th>Email/Contact Information</th>
</tr>
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<tbody>
<tr>
<td>President</td>
<td>Jacob Folkeringa, SRF Consulting Group</td>
<td><a href="mailto:jfolkeringa@srfrconsulting.com">jfolkeringa@srfrconsulting.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>Vice President</td>
<td>Kevin Peterson, Washington County</td>
<td><a href="mailto:Kevin.Peterson@co.washington.mn.us">Kevin.Peterson@co.washington.mn.us</a></td>
</tr>
<tr>
<td></td>
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<tr>
<td>Secretary</td>
<td>Tyler Krage, Alliant Engineering, Inc.</td>
<td><a href="mailto:tkrage@alliant-inc.com">tkrage@alliant-inc.com</a></td>
</tr>
<tr>
<td></td>
<td>Natalie Sager, HDR</td>
<td><a href="mailto:Natalie.Sager@hdrinc.com">Natalie.Sager@hdrinc.com</a></td>
</tr>
<tr>
<td></td>
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<tr>
<td>Treasurer</td>
<td>Morgan Hoxsie, Kimley-Horn</td>
<td><a href="mailto:Morgan.Hoxsie@kimley-horn.com">Morgan.Hoxsie@kimley-horn.com</a></td>
</tr>
<tr>
<td></td>
<td>Jeremy Melquist, City of Bloomington</td>
<td><a href="mailto:jmelquist@bloomingtonmn.gov">jmelquist@bloomingtonmn.gov</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directors</td>
<td>Morgan Hoxsie, Kimley-Horn</td>
<td><a href="mailto:Morgan.Hoxsie@kimley-horn.com">Morgan.Hoxsie@kimley-horn.com</a></td>
</tr>
<tr>
<td></td>
<td>Jacob Folkeringa, SRF Consulting Group</td>
<td><a href="mailto:jfolkeringa@srfrconsulting.com">jfolkeringa@srfrconsulting.com</a></td>
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</tr>
<tr>
<td>Past President</td>
<td>Jeff Preston, Stantec</td>
<td><a href="mailto:Jeff.Preston@stantec.com">Jeff.Preston@stantec.com</a></td>
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<tr>
<td>Executive Committee</td>
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<tr>
<td>Geometric Design</td>
<td>Ben Hobert, SRF Consulting Group</td>
<td><a href="mailto:bhobert@srfrconsulting.com">bhobert@srfrconsulting.com</a></td>
</tr>
<tr>
<td>Intersection Traffic Control</td>
<td>Pravin Dhakal, Isthmus Engineering Inc.</td>
<td><a href="mailto:pdhakal@isthmusengineering.com">pdhakal@isthmusengineering.com</a></td>
</tr>
<tr>
<td>ITS</td>
<td>Mike Kronzer, MnDOT</td>
<td><a href="mailto:michael.kronzer@state.mn.us">michael.kronzer@state.mn.us</a></td>
</tr>
<tr>
<td>Pedestrian and Traffic Safety</td>
<td>Stephen Smith, HNTB</td>
<td><a href="mailto:shsmith@HNTB.com">shsmith@HNTB.com</a></td>
</tr>
<tr>
<td>Planning Methods and Applications</td>
<td>Krista Anderson, SRF Consulting Group</td>
<td><a href="mailto:kanderson@srfrconsulting.com">kanderson@srfrconsulting.com</a></td>
</tr>
<tr>
<td>Traffic Operation and Maintenance Discussion Group</td>
<td>Adam Bruening, Washington County</td>
<td><a href="mailto:adam.bruening@co.washington.mn.us">adam.bruening@co.washington.mn.us</a></td>
</tr>
<tr>
<td>Simulation and Capacity Analysis</td>
<td>Mark Powers, Stantec</td>
<td><a href="mailto:Mark_Powers@stantec.com">Mark_Powers@stantec.com</a></td>
</tr>
<tr>
<td>Student Chapters</td>
<td></td>
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</tr>
<tr>
<td>University of Minnesota— TC</td>
<td>Aaron Bruinsma, President</td>
<td><a href="mailto:bruin029@umn.edu">bruin029@umn.edu</a></td>
</tr>
<tr>
<td>North Dakota State University</td>
<td>Lucas Borgerson, President</td>
<td><a href="mailto:lucas.b.borgerson@ndsu.edu">lucas.b.borgerson@ndsu.edu</a></td>
</tr>
<tr>
<td>University of Minnesota— Duluth</td>
<td>Jason Miller, President</td>
<td><a href="mailto:dtsoduluth@gmail.com">dtsoduluth@gmail.com</a></td>
</tr>
<tr>
<td>Midwestern ITE District Director</td>
<td>Kristi Sebastian, Dakota County</td>
<td><a href="mailto:kristi.sebastian@co.dakota.mn.us">kristi.sebastian@co.dakota.mn.us</a></td>
</tr>
<tr>
<td>Midwestern ITE District NCITE Officer</td>
<td>Scott Poska, Alliant Engineering, Inc.</td>
<td><a href="mailto:sposka@alliant-inc.com">sposka@alliant-inc.com</a></td>
</tr>
</tbody>
</table>
Greetings! I hope this newsletter finds you and your families, friends, and colleagues healthy and safe during the COVID-19 pandemic. Going into this year I would have never thought we would be living with the challenges we are facing today. While these times have been difficult I am proud of the way we have come together as transportation professionals to do what we can for society. Many people have been forced to change their daily lifestyle but the importance of transportation for all remains.

During these times NCITE continues to evolve the way we operate to best serve our members:

- Executive Board Meetings continue to take place on a regular basis. While the meetings are no longer in person the Board has continued to meet via video conference monthly.

- Technical Committees have been challenged to find ways to continue engaging members. Some committees are meeting online while others have started exchanging emails more regularly to share information about best practices.

- The April Section Meeting (Roadshow to Mankato) unfortunately had to be canceled. We are still looking for ways to take our Section Meetings on the road and plan to go to Mankato in the future.

- The May Section Meeting was changed from an in-person meeting to a video conference. While we weren’t able to gather in person, we still had a great time engaging with one another through introductions, NCITE/ITE updates, and a presentation on reduced speed limits from Randy Newton (City of St. Paul) and Ethan Fawley (City of Minneapolis).

- The Automated Traffic Signal Performance Measures (ATSPM) workshop scheduled for May was postponed but we are hoping to reschedule for later this year.

- The Summer Social will still take place in some form. The Executive Board is looking into various options depending on the status of COVID-19 this summer.

The COVID-19 pandemic creates unique challenges for transportation professionals. I encourage you all to check out ITE’s COVID-19 resources. ITE has assembled valuable information ranging from member support, national traffic statistics and trends, and resources to help us complete our projects during these times.

Finally, I want to thank all of you for your continued support of each other and the transportation community. I look forward to when we can meet in person again!

Jacob Folkeringa
2020 NCITE President
ITE Calendar for District, Section, & Chapter Meetings
Stay Connected with Virtual Events
Online | Dates Vary

2020 ITE Virtual Annual Meeting
Online | August 2020

Attend an Upcoming NCITE Technical Committee Meeting!
Check out upcoming topics here.
For more information on the committees and how you can get involved:
https://nc-ite.org/Committee_Listing

For professional development opportunities:
http://nc-ite.org/content.php?page=Professional_Development_Meetings

Upcoming NCITE Events:
http://nc-ite.org/calendar.php
January Section Meeting
The January Section Meeting was held at Crooked Pint on January 14\textsuperscript{th}, at 12:30. Kristine Elwood from MnDOT gave a presentation on future MnDOT programming. Some notable highlights included:

- Testing of LIDAR and operations in snow conditions
- Connected and Automated Vehicles (CAV) strategic plan and working across agencies to reach consensus
- Utilizing MnDOT Ped Safety Summits, CHIP reviews, and more to minimize pedestrian crashes
- Increases in drone uses

Special thanks to HDR for sponsoring the meeting!

February Section Meeting-
The February Section Meeting was held at Jax Cafe on February 25\textsuperscript{th}, at 8:30. Derek Leuer from MnDOT gave a presentation on MnDOT’s Strategic Highway Safety Plan (SHSP). Some notable highlights included:

- 47\% of crashes occurred at intersections
- Work zone and trains crashes lowest of all, at levels much lower than public perception and media coverage
- Culture serves as biggest contributor to change in human behavior

Special thanks to TCC for Sponsoring!

March Ethics Training-
NCITE teamed up with WTS in delivering an ethics training by Dr David Shultz. Dr Schultz led an interesting discussion on decision making in a morally diverse workplace. The ethics training was conducted virtually.
In the past four months, the YMC has held several well attended events. In February, the YMC went to Afton Alps for a day of skiing and snowboarding. We started with group lessons in the morning, then refueled on the patio with good food, drinks, and conversation. In the afternoon, everyone got together for a picture and a group run down Lisa’s Lane.

In March, the YMC Planning group got together over video chat to discuss our upcoming events including our Virtual Happy Hour/Game Night (April), Virtual Volunteering Trash Pickup (April), and our Annual Bike Tour (June).

We saw new and old faces at all of our events, and we are looking forward to more creative ways to convene YMC members.

If you would like to be added to the YMC email list, or know of any new hires/coworkers that would enjoy our events, please send email addresses to Kristin Carlson (carl4498@umn.edu) or Jack Olsson (Jack.Olsson@kimley-horn.com)
Project Selection
This project is currently in its third year of evaluations. MnDOT has worked towards evaluating projects in years six through eight of the CHIP. This allows for input prior to the purpose and need being established and funding solidified, and allows for thoughtful consideration of the bicycle and pedestrian recommendations.

A GIS-based spatial analysis tool — Suitability of the Pedestrian and Cycling Environment (SPACE) — uses publicly available data that is applied equally statewide and maintained by non-MnDOT agencies, such as the U.S. Census, Met Council, MnDOT, and other external agencies. For project selection or prioritization, the SPACE tool captures an estimate for demand where infrastructure does not exist.

The SPACE tool is used as a scoring mechanism to assist in choosing projects that warrant field walks. Projects are given a score out of 100 from data categories that include, but are not limited to, concentration of bus stops, schools, and individuals who cannot drive or do not have access to a vehicle, are unemployed or are living in poverty, which aligns with priorities and populations identified in MN Go and MN Walks as a focus area. The scores add a quantifiable element to the project selection process and identifies local attributes that might not otherwise be recognized.

An example project through Bena and Ball Club, MN, would not have been selected based on preliminary mapping review, but had a SPACE score of 54. The score was higher than most other projects, and therefore, a field walk was scheduled. After the walk, it was clear the two communities relied heavily on walking and bicycling between and within the communities and that there was a project need. The project is coordinating the long-term plan to add a separated, multi-use trail using TAP funds. The walk highlighted the need for the trail, and in the interim, identified potential countermeasures for crossing and the use of shoulders.

Each year, approximately four projects from each MnDOT District are selected (excluding the Minneapolis - St. Paul Metropolitan area) with the goal of providing about 30 recommendation reports. The projects are chosen through a combination of using the SPACE tool, completing mapping reviews, and meetings with project managers, planners, traffic engineers and other District staff.
Scoping Recommendations

Project recommendations are developed from the pedestrian and bicycle scoping field walks. The project team developed 14 “Strategy Sheets” that describe the safety applications most commonly recommended. The Strategy Sheets include a simplified definition, benefits, and standards for design and address the needs identified through the field walk.

Scoping recommendation strategies include:

The strategies contain proven safety countermeasures from the Minnesota Best Practices for Pedestrian and Bicycle Safety and FHWA Safe Transportation for Every Pedestrian (STEP) countermeasures, and information from MnDOT Technical Memorandums and MnDOT standard design practice. This includes the Road Design and Bikeway Facilities Design Manuals, as well as NACTO, FHWA and AASHTO design guidance.

The non-motorized improvements and engineering treatments used in the projects are ultimately chosen by the project manager and design team during the scoping process and refined through final design. The recommendations are intended to support MnDOT’s mission and vision to maximize the health of people, the environment, and the economy by promoting walking and biking for Minnesotans as modes of transportation as well as recreation.
TECHNICAL COMMITTEE UPDATE

Geometric Design Technical Committee
Committee Chair: Ben Hobert—bhobert@srfconsulting.com
Recent Agenda Items: Innovative Intersections Presentation
Future Agenda Items: TBD
Next Meeting: TBD

Intersection Traffic Control Technical Committee
Committee Chair: Pravin Dhakal
Recent Agenda Items: Synchro Upgrade Discussion, SNTC Updates, 2020 Topic Discussion
Future Agenda Items: Signal Timing Forum
Next Meeting: 8 am—10 am Tuesday June 9th

ITS Technical Committee
Committee Chair: Michael Kronzer - michael.kronzer@state.mn.us
Recent Agenda Items: MnROAD Automated Truck Project by Mike Kronzer of MNDOT.
Future Agenda Items: TBD
Next Meeting: TBD

Pedestrian and Traffic Safety Technical Committee
Committee Chair: Stephen Smith
Recent Agenda Items: Data Collection During COVID-19
Future Agenda Items: TBD
Next Meeting: TBD

Planning Methods and Applications Technical Committee
Committee Chair: Krista Anderson - kanderson@srfconsulting.com
Recent Agendas Items: New Population Synthesizer Application, TBI Results
Future Agendas Items: Updated Regional Network status, Transit Model Updates
Next Meeting: TBD

Traffic Operation and Maintenance Discussion Group
Committee Chair: Adam Bruening - adam.bruening@co.washington.mn.us
Recent Agenda Items: No recent meetings
Future Agenda Items: TBD
Next Meeting: TBD

Simulation and Capacity Analysis Technical Committee
Committee Chair: Mark Powers - Mark.Powers@stantec.com
Recent Agenda Items: No recent meetings
Future Agenda Items: TBD
Next Meeting: TBD
As transportation engineers, we’ve historically relied on traditional Measures of Effectiveness (MOEs) to evaluate mobility performance, such as: delay (level of service), speed, density, volume-to-capacity ratio (v/c), and queue lengths. Previously, prioritization of these metrics has improved mainline operations along the Trunk Highway (TH) 65 corridor in Anoka County, MN, but has resulted in long wait times to get onto or cross TH 65; therefore affecting the quality of trips for the local community. To better represent the needs of all roadway users on and across the corridor, a different set of MOEs has been applied in the TH 65 Planning and Environmental Linkages (PEL) study.

**Project Background**

TH 65 is currently undergoing Minnesota’s first PEL study; a study which links transportation planning directly, or by reference, into the NEPA process. Between CSAH 10 and Bunker Lake Blvd, TH 65 is a four-lane divided principal arterial with approximately 40,000-60,000 vehicles per day, and has been identified as having safety and operational deficiencies. Additionally, the roadway is difficult for people walking and biking to travel along or cross. HDR is collaborating with MnDOT, FHWA, and other key stakeholders (including City and County representatives) through a Technical Advisory Committee (TAC) to develop an objective evaluation process which broadly defines and vets alternatives based on the project purpose and need, as well as community input.

**Mobility Needs**

TH 65 is a four-lane divided signalized principal arterial that serves the north metro including Blaine, which is the fastest growing suburb in the Twin Cities metro area. TH 65 carries similar traffic volumes as the parallel section of I-35W, which is a freeway. To carry the heavy traffic demands, signals on the corridor have an average cycle length of 250 seconds and majority of the green time is used to move to north-south traffic on TH 65. While prioritizing through traffic increases capacity and improves overall intersection LOS, this causes high delays that are sometimes over 100 seconds, long queue lengths, and cycle failures on the side streets. To the surrounding community, TH 65 is a barrier for local travel where some users choose to revise their trips to avoid crossing the TH 65 corridor entirely due to the long side street delays.
A Different Approach

To better balance the needs of both the local community and commuting traffic, the following metrics were used to evaluate mobility for alternatives being considered in the TH 65 PEL study:

- Origin-Destination (O-D) Travel Times: Travel times are more easily understood by the public. Using primary origins and destinations to evaluate improvement in travel times can help make these metrics more relatable to the local community. They also allowed the TAC to objectively measure whether we are addressing the mobility needs for all users. By measuring travel times for the different modes present in the study area, a variety of road uses can be more equitably represented such as:
  - Bicyclists
  - Pedestrians
  - Freight
  - Transit (no adverse impact to trip time)
  - Vehicle Cross Traffic
  - Vehicle Through Traffic

- Throughput: Still need to achieve acceptable throughput (number of vehicles that are able to enter or exit the system).

- Speed: Goal of more consistent, reliable, and desirable speeds; not necessarily higher speeds.

- Distance to next crossing and multi-modal level of service (MMLOS): used to measure pedestrians’ and bicyclists’ ability to move safely and comfortably along/across the corridor.

Traditional MOEs, such as LOS, queues, and v/c are still being used to help develop and assess alternatives, however, they are not the primary drivers for the evaluation.

Outcomes

As a result of these metrics, stakeholders have been more accepting of non-traditional solutions. For example, some of the concepts developed in the study include grade separated median u-turns with parallel one-way frontage road systems (see Figure 2 below). Although this may seem more circuitous than typical freeway solutions, O-D travel improved significantly. The analysis for this concept has shown a travel time savings of up to 30 minutes along the corridor, and 5-10 minutes for O-Ds across the corridor for vehicular travel. Additionally, existing transit and freight routes show a 15-20 minute reduction in travel time. While pedestrian and bike O-D travel times only slightly improved, the primary benefit stemmed from the removal of a conflict with TH 65 traffic and relocation of crossings to slower and lower volume roads.
In summary, MOEs selected to evaluate mobility should stem from the needs of the study area. While the traditional measures such as LOS, queuing, and v/c can be used to evaluate performance along a corridor, they may not fully address local vehicular and non-motorized travel needs. In the case of the TH 65 PEL, using metrics such as travel times for the different mode O-Ds is shedding light on how well we are addressing all road user needs and is showing the potential benefits of less traditional transportation solutions.
Cypress Drive Improvements in Baxter, Minnesota
Scott Hedlund, PE, PMP | SEH

In each issue, the INCITER features articles coordinated by NCITE’s advertisers. This article is a contribution from SEH.

Study Interchange Areas: The Cypress Drive project in Baxter, MN used queue cutter traffic signals to manage rail and vehicle traffic.

Challenge
The northern Minnesota community of Baxter has for decades been experiencing a surge of traffic congestion. The problem is exacerbated during the busy summer travel season. As the gateway to the popular Brainerd Lakes Area, tourists and cabin-dwellers flock to the area to experience the plentiful lakes and natural ecology. As a result, the main local highways become clogged up during the summer, prompting locals to seek alternative routes.

Cypress Drive is a north/south roadway that was bisected by the heavily traveled State Highway 210 as well as a set of active mainline railroad tracks. Drivers and pedestrians on either end of the corridor could not efficiently access the other half. The northern half of Cypress Drive served as an alternative route to access shopping, retail and other community amenities, while the southern part served industrial areas and neighborhoods.

To access the businesses and amenities to the north, residents south of Highway 210 would have to travel several blocks out of the way to the east and cross over the busy highway. The other option to travel from south to north was to use the equally congested Highway 371 to the west. To give residents living and
working on the southern half of Cypress Drive better access to the north side, it would be necessary for Cypress Drive to extend through the busy highway and across the railroad tracks.

**Solution**

To improve traffic congestion and mobility in the area, the City opted to continue Cypress Drive through the busy Highway 210 corridor and across the railroad tracks. The existing portions of Cypress Drive were also converted from two-lane roadways to four-lane urban roadways.

The project required extensive collaboration between SEH, BNSF Railway, and the Minnesota Department of Transportation (MnDOT). The project featured a new railroad-highway at grade crossing and unique queue cutter traffic signal. A queue cutter traffic signal is intended to prevent vehicles stopped at adjacent traffic signals from backing up onto the roadway/railroad crossings. The signal is typically activated by an approaching train and coordinates with adjacent traffic control signals, getting vehicles out of the train’s path.

To further smooth traffic flow along the corridor, two multi-lane roundabouts were also constructed along Cypress Drive. One was added directly to the north of the Highway 210 crossing at Excelsior Road, and another roundabout was added along the southern part of the corridor at College Road. For multimodal users, the project team added on-road bike lanes along Cypress Drive as well as separated trails with multiple connections to the Paul Bunyan State Trail, a popular multi-use recreational trail.

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Two multi-lane roundabouts were used in the Cypress Drive project
To mitigate potential environmental concerns in the railroad corridor, an extensive environmental site assessment process and multiple agency coordination effort were also part of the highway connector project. The project also included rerouting of storm and sewer utilities along the corridor.

In the end, the project improved access and mobility for businesses, residents and visitors in the Brainerd/Baxter area while not impeding on the crucial seasonal traffic.
Over the last few years, State Aid and MnDOT have been transforming the Local Partnership Program (LPP) (formerly the Cooperative Agreement Program) to focus on development of long term and sustainable partnerships, collaboration of transportation system needs, leveraging of agency investments, and minimizing project time and cost. The program is now in every district and offers partnership opportunities with cities and counties to lead and construct highway improvements that are mutually beneficial, at locations that may not be programmed on state highways.

This program is managed by the District State Aid Engineers (DSAE) and State Aid staff dedicated to LPP. The State Aid staff assists local agencies with project development, schedule coordination, scope and budget management, and communication of the project design requirements.

The CSAH 15 and MnDOT TH 71 roundabout project was led by Beltrami County with Stonebrooke Engineering and was a cooperative agreement project using the LPP process. Through the program, the County’s project schedule from initial project discussion to completion was 19 months. Initial project discussions between Beltrami County and MnDOT started in February 2018. Once the decision was made to move forward, both partners worked together on geometric layout, design, and cooperative agreement requirements for an early 2019 letting. The project was awarded in April and the contractor was able to start construction in June. The CSAH 15 and MnDOT TH 71 roundabout project was completed and opened to traffic on August 22, 2019.
MnDOT staff from District 2, State Aid, Geometric Design Support Unit (GDSU), Freight Office, and ADA Operations group assisted with project development and plan reviews for the project. Involvement and coordination of these groups ensured the project served the interest and functionality of each group.

Stonebrooke Engineering engaged MnDOT GDSU early to perform an “over the shoulder” layout review once the preliminary roundabout geometrics were determined. The initial review provided a good opportunity to discuss the approach alignments and splitter island development, center island shape, as well as curb and gutter types. The review also helped in keeping the project on schedule, by reducing the possibility of major design changes occurring after the official layout submittal.

TH 71 is a designated oversize/overweight (OSOW) and house moving route. The CSAH 15 overpass causes height restrictions on TH 71 that require oversize vehicles use the interchange ramps to bypass the low clearance bridge to continue along TH 71. Through coordination with the MnDOT Freight Office, the roundabout was designed to accommodate larger and low clearance freight vehicles. Turning movements were analyzed and the center truck apron curb height was reduced from typical standard to ensure the low clearance tractor trailers could safely and effectively maneuver the roundabout.

MnDOT ADA Operations worked with the team to identify non-motorized needs at the intersection, to best utilize the minimal space available approaching the inplace CSAH 15 bridge. Due to the rural location of the roundabout, sidewalks, slip ramps, and median refuges were widened to provide space for maintenance vehicles to clear snow in the winter.

The partnership between MnDOT, Beltrami County and Stonebrooke Engineering demonstrated that good work can be achieved in an efficient manner. This roundabout project also benefited users on the county and state highway system, reduced project schedule and cost, and minimized construction impacts to the traveling public.

Image provided by John Noehring (Beltrami County)
ITE LOL

CAN I BORROW YOUR STAPLER?

NOT WITH YOUR BARE HANDS. BUT I CAN WRAP IT IN PLASTIC AND LEAVE A HOLE FOR THE STAPLES TO COME OUT.

MAYBE YOU CAN JUST LEND ME A PAPER CLIP.

I’LL THROW IT TO YOU.

Source: Dilbert.com
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Frederick Tartt - University of Minnesota
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