E-Scooters and What They Mean For Our Transportation System

Tyler Krage, EIT | Alliant Engineering

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

One July morning, something unexpected occurred in the Twin Cities – loads of electronic scooters just showed up. Without warning, Bird followed by Lime, e-scooters filled the news and public officials’ thoughts with what needed to be done and how to move forward. St Paul and Minneapolis eventually created policies and permits for the dock-less e-scooters and conducted a trial study to evaluate the operations and safety of the app-driven service.

Luckily, the Twin Cities were not the first metropolitan area to experience the e-scooter boom, therefore a framework existed to approach the problem. Unfortunately, each city had taken wildly different mentalities, from outlawing and confiscating the scooters to mild regulation or a laissez-faire approach. The Twin Cities developed policies for the e-scooter services to use, finding a middle ground. With the trial study wrapping up in November, an informed opinion may be made on some of these services by looking at some of the major benefits and drawbacks.

Pro #1 – Fun and Easy to Use
Perhaps the most obvious of the benefits of the e-scooter implementation is that they are fairly intuitive to figure out, and extremely fun to use.

Source: Bird, Instagram

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## EXECUTIVE COMMITTEE

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Organization</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>Scott Poska, City of Minneapolis</td>
<td>612.673.3738</td>
<td><a href="mailto:Scott.poska@minneapolismn.gov">Scott.poska@minneapolismn.gov</a></td>
<td></td>
</tr>
<tr>
<td>Vice President</td>
<td>Jeff Preston, Stantec</td>
<td>651.604.4816</td>
<td><a href="mailto:Jeff.Preston@stantec.com">Jeff.Preston@stantec.com</a></td>
<td></td>
</tr>
<tr>
<td>Secretary</td>
<td>Jacob Folkeringa, SRF Consulting Group</td>
<td>763.452.4730</td>
<td><a href="mailto:jfolkeringa@erfccompliance.com">jfolkeringa@erfccompliance.com</a></td>
<td></td>
</tr>
<tr>
<td>Treasurer</td>
<td>Kevin Peterson, Washington County</td>
<td>651.430.4330</td>
<td><a href="mailto:Kevin.Peterson@co.washington.mn.us">Kevin.Peterson@co.washington.mn.us</a></td>
<td></td>
</tr>
<tr>
<td>Directors</td>
<td>Mike Fairbanks, MnDOT</td>
<td>651.234.7819</td>
<td><a href="mailto:mike.fairbanks@state.mn.us">mike.fairbanks@state.mn.us</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tyler Krage, Alliant Engineering, Inc.</td>
<td>612.450.9305</td>
<td><a href="mailto:tkrage@alliant-inc.com">tkrage@alliant-inc.com</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Natalie Sager (Lindsoe), HDR</td>
<td>763.591.5424</td>
<td><a href="mailto:Natalie.Lindsoe@hdrinc.com">Natalie.Lindsoe@hdrinc.com</a></td>
<td></td>
</tr>
<tr>
<td>Past President</td>
<td>Mike Martinez, HDR</td>
<td>763.591.5442</td>
<td><a href="mailto:michael.martinez@hdrinc.com">michael.martinez@hdrinc.com</a></td>
<td></td>
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## STANDING COMMITTEES

<table>
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<tr>
<th>Committee</th>
<th>Chair</th>
<th>Organization</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young Member Committee</td>
<td>Jeremy Melquist, Bolton &amp; Menk</td>
<td>612.767.9322</td>
<td><a href="mailto:jmelquist@kljeng.com">jmelquist@kljeng.com</a></td>
<td></td>
</tr>
<tr>
<td>Professional Development</td>
<td>Ellie Lee, Alliant Engineering</td>
<td>612.233.1012</td>
<td><a href="mailto:ellee@alliant-inc.com">ellee@alliant-inc.com</a></td>
<td></td>
</tr>
<tr>
<td>Student Activities and Career Guidance</td>
<td>Ann Fanger, Alliant Engineering, Inc.</td>
<td>612.767.9322</td>
<td><a href="mailto:afanger@alliant-inc.com">afanger@alliant-inc.com</a></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>Jacob Folkeringa, SRF Consulting Group</td>
<td>763.452.4730</td>
<td><a href="mailto:jfolkeringa@erfccompliance.com">jfolkeringa@erfccompliance.com</a></td>
<td></td>
</tr>
<tr>
<td>Website</td>
<td>Jonath Finkelstein, Spack Consulting</td>
<td>888.233.1012</td>
<td><a href="mailto:jfinkelstein@spackconsulting.com">jfinkelstein@spackconsulting.com</a></td>
<td></td>
</tr>
<tr>
<td>Newsletter</td>
<td>Cortney Falero, SRF Consulting Group</td>
<td>763.452.4806</td>
<td><a href="mailto:cfalero@erfccompliance.com">cfalero@erfccompliance.com</a></td>
<td></td>
</tr>
<tr>
<td>Membership</td>
<td>Morgan Hoxsie, Kimley-Horn</td>
<td>612.234.7819</td>
<td><a href="mailto:morgan.hoxsie@kimley-horn.com">morgan.hoxsie@kimley-horn.com</a></td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>Jordan Schwarze, Alliant Engineering</td>
<td>612.767.9322</td>
<td><a href="mailto:jschwarze@alliant-inc.com">jschwarze@alliant-inc.com</a></td>
<td></td>
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## TECHNICAL COMMITTEES

<table>
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<tr>
<th>Committee</th>
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<th>Organization</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometric Design</td>
<td>Thomas Jantscher, HRGreen</td>
<td>651.659.7769</td>
<td><a href="mailto:tjantscher@hrgreen.com">tjantscher@hrgreen.com</a></td>
<td></td>
</tr>
<tr>
<td>Intersection Traffic Control</td>
<td>Nik Costello, Washington County</td>
<td>651.430.4330</td>
<td><a href="mailto:nik.costello@co.washington.mn.us">nik.costello@co.washington.mn.us</a></td>
<td></td>
</tr>
<tr>
<td>ITS</td>
<td>Todd Olsen, Alliant Engineering</td>
<td>612.720.0811</td>
<td><a href="mailto:tolsong@alliant-inc.com">tolsong@alliant-inc.com</a></td>
<td></td>
</tr>
<tr>
<td>Pedestrian and Traffic Safety</td>
<td>Tyler Krage, Alliant Engineering</td>
<td>612.450.9305</td>
<td><a href="mailto:tkrage@alliant-inc.com">tkrage@alliant-inc.com</a></td>
<td></td>
</tr>
<tr>
<td>Planning Methods and Applications</td>
<td>Steven Ruegg, WSP Parsons Brinckerhoff</td>
<td><a href="mailto:ruegg@pbworld.com">ruegg@pbworld.com</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic Operation and Maintenance Discussion Group</td>
<td>Adam Bruening, Washington County</td>
<td>651.430.4398</td>
<td><a href="mailto:adam.bruening@co.washington.mn.us">adam.bruening@co.washington.mn.us</a></td>
<td></td>
</tr>
<tr>
<td>Simulation and Capacity Analysis</td>
<td>Derek Lehrke, MnDOT</td>
<td>651.234.7828</td>
<td><a href="mailto:derek.lehrke@state.mn.us">derek.lehrke@state.mn.us</a></td>
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## STUDENT CHAPTERS

<table>
<thead>
<tr>
<th>University</th>
<th>President</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Minnesota</td>
<td>Jack Olsson, President</td>
<td><a href="mailto:olsso045@umn.edu">olsso045@umn.edu</a></td>
</tr>
<tr>
<td>North Dakota State University</td>
<td>Sharijad Hasan, President</td>
<td><a href="mailto:md.s.hasan@ndsu.edu">md.s.hasan@ndsu.edu</a></td>
</tr>
</tbody>
</table>

## MIDWESTERN ITE

<table>
<thead>
<tr>
<th>Position</th>
<th>Chair</th>
<th>Organization</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midwestern ITE District Director</td>
<td>John A. Davis, Ayers Associates</td>
<td>262.522.4905</td>
<td><a href="mailto:davisj@ayersassociates.com">davisj@ayersassociates.com</a></td>
<td></td>
</tr>
<tr>
<td>Midwestern ITE District NCITE Officer</td>
<td>Mike Bittner, KLJ</td>
<td>701.271.4879</td>
<td><a href="mailto:mike.bittner@kljeng.com">mike.bittner@kljeng.com</a></td>
<td></td>
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www.nc-ite.org
Scott Poska, 2018 NCITE President

The 2018 Joint ITE International and Midwestern/Great Lakes Districts Annual Meeting and Exhibit was a wild success. OK, we are biased, but, it was a success! It was the first ITE Annual Meeting held within the MWITE district since 2011 in St. Louis, and the first within the NCITE section boundaries since 1996. Members of the Local Arrangements Committee (LAC) and ITE International staff worked diligently together to develop a stellar technical program and multiple enjoyable social activities. Hats off to NCITE members that were part of the LAC: Morgan Hoxie, Joe Gustafson, Bryant Ficek, Cortney Falero, Jacob Folkeringa, Jeff Preston, Sue Zarling, Mike Martinez, Tyler Krage, Kristi Sebastian, Tom Campbell, Derek Nieveen, Nick Erpelding, Mike Spack, JoNette Kuhnau, Abby Rieckman, Joe DeVore, Mike Anderson, Phil Kulis, Randy Newton, Sarah Tracy, Wayne Sandberg, Steve Manhart, Scott Poska, and John Crawford.

The technical components included a diverse range of technical session presentations, workshops, technical poster sessions, round tables, technical walking and bicycling tours, and technical tours. NCITE members emerged as technical leaders in many traffic and transportation subject areas, and as a result, were presenters in approximately half of the Technical Sessions and comprised of approximately a quarter of the total posters in the Poster Sessions.
The non-technical elements included social activities at the new U.S. Bank Stadium, Brit's Pub, a family friendly walking tour, the MiteY Race, the Traffic Bowl Grand Championship, and several impromptu activities. The winning MiteY race team was comprised of NCITE members Joe DeVore (along with wife Laura DeVore), Kevin Mackey, and Stephen Joerz.
MiteY Race Winners from KLJ Engineering—
Joe DeVore, Laura DeVore, Kevin Mackey, & Stephen Joerz

NCITE Members at the Traffic Bowl Grand Championship
NCITE and its members were recognized for individual and section achievements at the meeting. NCITE was awarded MWITE's and ITE's 2018 Communications Award! NCITE Communications Coordinator Jacob Folkeringa submitted NCITE’s application and received the award on behalf of the NCITE Communications Group, which includes Jonah Finkelstein, Cortney Falero, Morgan Hoxie, Joe DeVore, Ann Fanger, and Chad Jorgensen. The Communications Award recognizes the Section that effectively communicates with their membership through innovative approaches and the use of new media.

NCITE was awarded MWITE's 2018 Section Activities Award for the second year in a row! NCITE Vice-President Jeff Preston submitted NCITE's application and received the award on behalf of the Section. The Section Activities Award is designed to encourage and promote active involvement by ITE sections and chapters in activities, promotion, and the purpose and objectives of ITE.
MWITE District Administrator and NCITE past president Tom Campbell was awarded MWITE's Distinguished Member Award! The Distinguished Member Award is awarded annually as an honorary designation presented to a member of the District who has provided outstanding and significant contributions to ITE, the District, and their Section/Chapter over a period of many years.

A big thank you goes out to all NCITE members and sponsors involved in the success of the meeting, whether volunteering, presenting, sponsoring, or just attending. The successful, and positive events showed ITE what we’re made of. Let’s hope we can bring the meeting back to the District again soon!

**See more pictures from ITE on page 20!**

John Crawford, 2003 NCITE President, LAC Chair
Steve Manhart, 2001 NCITE President, LAC Co-Chair
Scott Poska 2018 NCITE President, LAC Co-Chair
2019 TRB Annual Meeting
January 13-17, 2019
Walter E Washington Convention Center | Washington, DC

2019 ATTSA Convention
February 8-12, 2019
Tampa Convention Center | Tampa, FL

Minnesota Transportation Conference
March 13-14, 2019
St Paul River Center | St Paul, MN

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

Upcoming NCITE Events:
http://nc-ite.org/calendar.php
The September Section Meeting was held on September 18, 2018 at Hiway Federal Credit Union.

The presenter was Dale Grove of Stantec, presenting on the Baudette Bridge International Crossing Project. Highlights of the presentation included:

Bridge History
- The bridge was constructed in 1959 and symbolized the transportation initiative to connect Minnesota and Ontario.
- The bridge operated as a toll bridge until 1988.

Reason for Bridge Replacement
- Corrosion was present on the structural members of the bridge
- The bridge was classified as “fracture critical” and had a sufficiency rating of 48.8 out of 100.

Project Team Development
- The project team was non-traditional in that it consisted of two cities, two countries, and two transportation agencies.
- The project team was divided into a US task team and a Canadian task team who reported to the overall project manager.

Project Challenges
- Which agency leads the project and makes final decisions?
- Who should work on the project and will they be around long enough to see it through completion?
- How should project meetings take place with stakeholders spread across the US and Canada?
- Whose design standards should be followed?
- This is not a “typical” project – there are no manuals or guides.
- The bridge is a port of entry and cannot be closed for more than 15 minutes.

Project Development
- A project communication guide was developed to ensure proper communications throughout the project.
- Value engineering was encouraged not just to save money but to collect ideas.
- A bridge standards workshop was conducted to settle on bridge standards, particularly those that differed between the US and Canada.
- The project team had to work through the environmental documentation per US and Canada standards.

Construction Issues
- Who administers the construction contract?
- Can the contractor’s employees cross the border?
- How are construction materials imported and taxed?

Lessons Learned
- Be ready to listen – there were 96 project stakeholders.
- Be ready to compromise, especially when agency standards contradict each other.
- Be ready to document – lots of project specific decisions were made.
The October Section Meeting was held on October 23, 2018 at University of Minnesota.

The presenter was Dr. Nichole Morris of the HumanFIRST Lab at the U of MN, presenting on “Changing Driver Culture Towards Pedestrians in St Paul”. Highlights of the presentation included:

Background
- Project began as a result of St Paul's “Stop for Me” campaign, which included high visibility enforcement.
- The state of MN wanted to measure if high visibility enforcement is effective.
- Nichole is part of the Roadway Safety Institute and was guided by another member who had done a similar study in Florida.

Measurement
- Difficult to measure driver yielding because testers risk their lives stepping in front of traffic. Also, there is the risk of forced yielding if a tester enters the crosswalk and the driver is forced to stop to avoid hitting them.
- Testers utilized “staged crossings” and standardized the way they entered and navigated a crosswalk.
- Tested unsignalized, marked crossings and chose sites that had a history of fatal pedestrian collisions.
- Placed enforcement downstream during testing periods.
- Needed to choose intersections with high volumes to have more data.
- Measured baseline performance before testing.
- Choose sites spread around the city, some had enforcement and others were unenforced.
- Tested in teams of two and crossed 20 times per site on clear, sunny days between the hours of 9am and 4pm.

Planning interventions
- Focus on passing violations because they put pedestrians at high risk
- Found out that fines couldn’t be increased, but can make it so that drivers ticketed with passing violations have to go to court for endangering life.

Education
- Created various education materials to share the dangers of passing vehicles at crossings. This included a video, printed flyers posted at schools, an infographic, and notices pushed out to communities which shared information on the recent ticket change.

Findings
- Multi-threat passings decreased from 11% to 3% at all crossings
- Stopping sight distances improved (more than 50% stopped 40 feet or more in advance of the crossing)
- Issues at bus stops located at crossings, recommend bus stops be located on the far side to have loading be away from the crosswalk.

Takeaways
- Hard and dangerous work
- Integrating the 3 E's takes a LOT of coordination. If a city takes this on, recommend having someone dedicated to this.
The October YMC event consisted of a happy hour at Surly Brewery before the Minnesota Football game.

The remaining YMC events for the year include:

1. Poker Night at Spack Consulting (11/20 @ 6pm)
2. YMC & ITSO meetup at Stub & Herb’s (11/26 @ 7pm)

We’re thankful everyone made the second year of the YMC a success and we look forward to seeing everyone next year!

If you would like to be added to the YMC email list for future events, please email Jeremy Melquist (jeremy.melquist@kljeng.com).
The Student Leadership Summit which was hosted August 17th to August 19th on the University of Minnesota campus. We had about 70 students in attendance from 3 different countries (US, Canada, Australia) and over 10 universities. The summit included presentation sessions (focusing on Transportation Issues of Today and Transport of the Future), a keynote presentation with Scott McBride from MnDOT, technical workshops (VISSIM, GIS, Data Visualization), tours (MSP Airport, MN Nice Ride, and Metro Transit Light Rail Facility), a mini-career fair, leadership activities, and professional development sessions. It was a jam packed weekend, and everything went off without a hitch! ITSO will hopefully be getting the duty of hosting the next SLS passed on to the next student chapter here soon.

Miscellaneous updates for this semester:
- Implemented a membership plan to help students feel more included and involved in the organization
- Holding 3 TranspoTalks (lunch and learns) - first one featured a speaker discussing pavement recycling
Once the app is downloaded, the user simply finds a scooter and scans the QR code. For one dollar the scooter is unlocked, and the users pay around 15 cents per mile. Once the user is finished riding, the scooter is deactivated, and a picture of proof that the scooter is in a safe place is snapped on the app (more on that later). As a dock-less system skeptic, the apps work much better than preconceived notions let on, and the variability of locations proved to be helpful. Aside from logistics, the e-scooters can hit speeds of up to 15 mph (more on that later too), and it’s hard to frown while riding one, regardless of appearance.

**Pro #2 – Tourism, Economy, and Commuter Benefits**
The scooters are heavily utilized by tourists spending a nice day in the city for sports events or visits. The service is a great way for visitors to see what’s to offer. Research has shown that docked bike services increase business to restaurants and other attractions. One doesn’t need to reason that a similar effect may be noticed with dock-less scooters. Getting people out and spending their money strengthens the local economy. The scooters serve as a good tool in the transportation toolbox for both tourists and commuters, as a system with more options allows for users to make more adaptable choices.

**Pro #3 – Advocate Tool**
Getting people to use scooters has a unique, but obvious side effect – it gets people on the streets. While pedestrians and bicyclists largely had already utilized non-motorized infrastructure, a whole new group of users are now on the street, and an intimate interaction with the road network can be beneficial to those who may be unfamiliar. The scooters are treated similarly to bicycles, wherein the users are not allowed to use the sidewalk, which means bike lane or on-street usage. This can expose deficiencies within the existing network to users and potential policymakers, which in turn may help to eventually create a safer system for all users. The service may be a helpful tool for advocates to show an enhanced perspective to transportation system users in making future infrastructure changes, especially in shared systems.

**Con #1 – Safety**
The big one, and largely the most important factor to consider is the safety of the scooters. As mentioned, the scooters can hit pretty high speeds, creating a high risk for things to go wrong. They are more dependent on the roadway surface and have more balancing issues than bicycles and offer very little protection from crashes. After the trial period in Minnesota, data will provide more detail on how crashes changed after the implementation. On a national scale, not only are injuries between scooters and vehicles being noticed, but also between scooters and other non-motorized users; however, no official tally is known. There has been a death in Dallas (however perhaps not entirely related to the scooter itself) of a scooter user, and faulty scooter maintenance may have an impact on user handling.
Con #2 – User Compliance
This point is somewhat related to the safety, but the scooters exist on an “honor-code”. Helmets are required to be worn while using, but no enforcement occurs, therefore a large amount of people don’t wear helmets. Scooters aren’t allowed on the sidewalks, but if users want to utilize them, they do. Scooters are meant to be parked in a safe location, and a picture is taken of the scooter, but nothing is done with the picture, so effectively they can be left wherever. I myself have violated some of the terms, either by intent or accident. This non-compliance may lead to unsafe and unfavorable conditions for both the user and other transportation system users in the form of ADA issues and an increase in crashes and crash severity.

Con #3 – Legal Issues and Legislation
Although not as much of a factor as the safety of users, the legal question of the e-scooters is brought up. Is it appropriate for a private company to put their property in public right-of-way? Do the scooters become public property? What if the scooters are damaged? Even worse, what if they’re damaged and cause a crash to happen? Or malfunction? Who is at fault? Plenty of questions, all that have legislators and lawyers stewing.

No matter the opinion on them, it seems like the scooters are here to stay. Love them or hate them, they have both positive and negative effects on the transportation system, and given exposure and time, the best way to utilize e-scooters will soon be established. At least until electronic skateboards or pogo sticks make the scene.
Geometric Design Technical Committee
Committee Chair: Thomas Jantscher - tjantscher@hrgreen.com
Recent Agenda Items: Local Leaders, Perspective on the Future of Transportation" (viewing of the recorded session from the 2018 ITE Int'l / MW/GLD meeting in Minneapolis last August, and discussion).
Future Agenda Items: Tentatively a presentation on MnDOT land use context update.
Next Meeting: TBD

Intersection Traffic Control Technical Committee
Committee Chair: Nik Costello - nik.costello@co.washington.mn.us
Recent Agenda Items: Washington Avenue Cycle Track Tour.
Future Agenda Items: Tentatively Regional ATMS Forum
Next Meeting: Wednesday December 5th, 8:00am - 10:00am, location TBD.

ITS Technical Committee
Committee Chair: Todd Olson - toolson@alliant-inc.com
Future Agenda Items: Cory Johnson, MnDOT – Connected Corridors.
Next Meeting: Tuesday December 4th, 1:00pm – 3:00pm, MnDOT Water’s Edge.

Pedestrian and Traffic Safety Technical Committee
Committee Chair: Tyler Krage - tkrage@alliant-inc.com
Recent Agenda Items: Washington Ave Cycle Track Tour, Scooter Safety Forum.
Future Agenda Items: Pedestrian Beacons and Signals in Higher Speed, Non-Urban Areas.
Next Meeting: TBD

Planning Methods and Applications Technical Committee
Committee Chair: Steven Ruegg - ruegg@pbworld.com
Recent Agendas Items: Discussion on the committee’s project of creating an ABM user’s guide.Future Agendas Items: Discussion on the chapters of the ABM user’s guide.
Next Meeting: Discussion on the chapters of the ABM user’s guide.

Traffic Operation and Maintenance Discussion Group
Committee Chair: Adam Bruening - adam.bruening@co.washington.mn.us
Recent Agenda Items: Discussions on storage of retained signal poles, disposal of latex and old paint, traffic service can specifications.
Future Agenda Items: TBD
Next Meeting: Wednesday December 5th, Location TBD (First Wednesday of each month).

Simulation and Capacity Analysis Technical Committee
Committee Chair: Derek Lehrke - derek.lehrke@state.mn.us
Recent Agenda Items: New features in UDOT’s SPM software version 4.2. VISSIM training recap from the Student Leadership Summit.
Future Agenda Items: TBD
Next Meeting: Wednesday December 5th, 1:00pm – 3:30pm, MnDOT’s Waters Edge room 403
How About A Roundabout? Yes, Please!

Tim Arvidson, PE & Anita Benson, PE | Stonebrooke Engineering Inc.

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

As members of the transportation industry, everyone is aware of the negative perception and public acceptance issues that occur when a new roundabout location is proposed. Much has changed in the twenty-three years since the first roundabouts were constructed in Minnesota. Engineers have improved roundabout designs to better accommodate traffic of all kinds and the public has learned to navigate and appreciate the safety and mobility benefits roundabouts provide. Public perception has changed from outrage and frustration to acceptance, and in some cases, even praise. This is due largely to the efforts of transportation professionals like you, and your dedication to public outreach and education.

Recently, Stonebrooke Engineering completed a corridor study, preliminary and final design services for a 1.5-mile segment of CSAH 7 (Division Street) in Bemidji for Beltrami County. The segment extended from Becida Road to Jefferson Street and included the CSAH 14 and TH 2 ramps. This well-known and highly traveled gateway corridor into downtown Bemidji needed improvements to meet community needs. At the time of the study, a new elementary school (Gene Dillon) was being planned at the west end of the corridor. Bemidji High School, located near the middle of the corridor, was experiencing traffic issues.

Source: Beltrami Roundabout; Stonebrooke Engineering

(Continued on page 18)
Five years ago, this project likely would have met fierce opposition from the public and community leaders. We would have been lectured on why roundabouts aren’t safe (especially for pedestrians), told that they aren’t large enough for trucks, and blasted for daring to propose something that nobody understands how to drive and will surely get people killed. This project in contrast, went very smoothly. Yes, there were some mutterings of public concern and a couple of unsupportive community leaders that were opposed for the reasons listed above. Despite this however, most comments received were neutral or positive throughout the public process. As a result, Bemidji’s first roundabout was constructed at Jefferson Avenue in 2017; the eastern most intersection of the corridor. Three additional roundabouts were constructed at Becida Road, CSAH 11 (Adams Avenue) and at the Bemidji High School entrance in 2018. A fifth roundabout is currently in design with plans for construction in the spring of 2019.

The Local Road Research Board (LRRB) and MnDOT have sponsored educational videos such as https://stonebrookeengineering.com/portfolio/roundabout-myths-video/ and many others related to dispelling myths related to roundabouts. These videos and other interactive roundabout educational experiences developed and used by local agency engineers in public involvement processes for projects, have been vital to gaining public support for the construction of roundabout projects.

Thank you to all transportation professionals who have worked hard over the years to promote traffic safety and mobility through innovative highway design solutions!

Source: Beltrami Roundabout; Stonebrooke Engineering
Using Technology to Perform Curve Speed Assessments

Erik Seiberlich, Project Manager | WSB

While traveling down a winding road, drivers often don’t notice curve warnings, but instinct tells them to slow down. Curve speed warnings signal our brains to slow down when approaching a curve or exit. Without the warning, drivers may not remember to reduce their speed. This becomes increasingly important when drivers are traveling at night or in an area that they’re unfamiliar with.

Federal law requires curve speed warnings signs in advance of horizontal curves on freeways, expressways and roadways. Previously, the most common curve assessments were performed with in-field evaluations or the assessments of original design plans. In-field evaluations rely on visual cues. Warning signs are based on instinct rather than data. Although precautionary, sometimes signage may not be required resulting in increased costs.

More modern approaches to curve speed assessments are continuing to advance and are becoming more efficient and cost-effective. Two new technologies being utilized are an accelerometer and a digital Ball Bank paired with GPS and mobile GIS applications. These technologies allow for the efficient measuring of side friction at curves, paired with location and speed.

Additionally, the Curve Advisory Reporting Service (CARS) system provides an evaluation that eliminates the need for future reevaluation. CARS works by pairing a digital ball bank, GPS, and GIS together to provide information on location, super elevation, radius, and advisory speed. Since an output of the CARS evaluation is the radius of the curve and the super elevation the tool provides a full survey of the curve, omitting the need of any future evaluation even if speeds change on this road.

Putting Technology to Work

The North Dakota Department of Transportation (NDDOT) recently needed to evaluate over 1,500 curves throughout the entire state. Using an accelerometer, mobile data collection in this large area project occurred across North Dakota.

NDDOT needed a project partner with experience in mass area data collection. Previously, the state performed curve assessments using an analog ball bank. The use of the analog method meant more manpower and less accurate data. To increase efficiencies and accuracy, the team approached the curve assessment with modern tactics. This meant data was collected digitally, rather than by hand as in previous curve studies. Location information was accurate for each assessment following each drive. After driving from north to south and east to west throughout the entire state, our team was able to assess over 1,500 curves in as little as three weeks.
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Queue is just a Q followed by 4 silent letters. They aren't silent. They're waiting their turn.
MEMBERSHIP UPDATE

New Members

Abdullahi Abdulle - City of Minneapolis
Chad Russell Braun - Carver County
Pratik Srivastava - SRF Consulting Group
Kristin Atkins - Toole Design
Kris Hansen - 3M
Aaron Lauinger - Ulteig
James Watters - MSA Professional Services
Sara Schoening – Student SDSU
Samundra Thapa – Student SDSU
Jared James Rothmeier – Student SDSU
Jenna Brooke Girard – Student SDSU
Aaron Johnson – City Of Minneapolis
Abigail Rae Berg – Student SDSU
Gunnar Kern – Student SDSU
Josh Nelson – Student SDSU
Traci Kay Sletmoe - KLJ

Moves

Ellie Lee – Alliant Engineering, Inc, formerly with HDR Engineering
Pratik Srivastava - SRF, formerly University of Cincinnati
John F. Crawford – KLJ Engineering, formerly with Kimley-Horn
Benjamin M. Brasser - SRF, formerly with KL Engineering
Jonathan D. Wiegand - HDR, formerly with HR Green, Inc.
Justin D. Sebens – SRF, formerly with Kimley-Horn
Mark A. Wagner – MnDOT, formerly with SEH, Inc.
Stephen R. Joersz - City of Minot, formerly with KLJ Engineering
Jack A. Olsson – Kimley-Horn, formerly Kansas State University
Rudrakshi Biswas - SRF, formerly University of Minnesota

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Cortney Falero
Newsletter Editor
CFalero@srfconsulting.com
763.452.4806