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Supporting Technology: Behind the Scenes of the Rochester Autonomous Shuttle Project

Matt Allwood, Regional Support Manager | Traffic Control Corporation

In each issue, the INCITER features an article coordinated by one of NCITE's technical committees. This article is a contribution from the **Emerging Technologies Committee**.

The Minnesota Department of Transportation (MnDOT), in partnership with the City of Rochester, has deployed the Med City Mover project. The goal of the project is to safely operate a low-speed, highly automated shuttle in the urban environment of downtown Rochester for a 12-month period; during which time MnDOT will gather critical information about the operations of autonomous vehicles as it relates to weather conditions, infrastructure, public education, and mobility.

Through the MnDOT CAV Challenge process, MnDOT selected the EV10 automated shuttle to be provided by EasyMile and operated by First Transit. The EZ10 is considered a Level 4 autonomous shuttle with a 12-passenger capacity and operating speeds of 12-15mph. While the vehicle does not have any steering wheels or pedals, an attendant is always on-board the vehicle ready to take over control if needed, using a custom controller.

The automated shuttle operates clockwise along a pre-determined route around the Mayo Clinic, shown in Figure 1. The Automated Shuttle uses on-board sensors and route mapping to safely guide itself along this path. The challenge is when it approaches a traffic signal. To account for this the project deployed C-V2X technology to improve safety and connectivity along the corridor. The shuttle is equipped with an On-Board Unit (OBU) to communicate with the traffic signal via Dedicated Short Range Communications Radios or DSRC. When the shuttle comes to an intersection, it receives broadcasted messages in the form of signal phasing and timing (SPaT) messages from the traffic signals via Road Side Units (RSU) along the route. This allows the shuttle to anticipate the signal phase changes and proceed safely along the route. The shuttle also transmits a priority request to the traffic signal. The traffic signal controller is programmed to give priority to the shuttle. All network communications between the traffic controller and the RSU is routed via the city network, to a firewall before it hits the RSU. This allows for a secure connection between the connected vehicle network and the traffic signal network.



Figure 1: Mayo Clinic Shuttle Route

(Continued on page 7)

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PRESIDENT'S MESSAGE

Spring is (finally) here and we are already 5 months into the year! So far we have hosted four section meetings with a variety of topics, including: Roundabout Capacity and Design Guidance from MnDOT, Ethics Training, Twin Ports Interchange Construction Staging and MOT, and most recently, the Northwest River Crossing Study. A special thank you to our presenters! Our April section meeting was our first in-person section meeting in over two years. It was great to see so many familiar and new faces, and to once again enjoy a hot breakfast at Jax Café! Thank you to those of you who were able to join virtually as well.

Several exciting events are planned for the next few months. We are currently planning the next section meeting, which will be a Membership Drive. This will likely be a happy hour event in June and we'll offer free registration to first time section meeting attendees. Also in the near future is our summer social and student scholarship fundraiser event for July or August. Our 10 committees continue to meet regularly through the year. Visit the NCITE webpage www.nc-ite.org, [LinkedIn](#), and [Twitter](#) for current information on upcoming events.

Get involved! If you would like to present at a future section meeting or have presentation ideas, summer social ideas, annual meeting ideas, or STEM/student outreach ideas please reach out to us. We have a few open positions for committees (Geometric Design Chair/Co-Chair and ITC Co-Chair, Planning Methods and Applications co-chair). If anyone is interested reach out to myself or our VP, [Jeremy Melquist](#).

Registration is open for the district meeting in Duluth from June 20-22. Early bird pricing is offered until May 20th and registration closes on June 5th. Our local arrangements committee has been working hard to make this a great event filled with insights from industry thought leaders, peer-to-peer conversation, networking, and the opportunity to learn about the latest in products and services. I hope to see you there! <https://greatlakesite.org/annual-meeting-2022/>

Registration is also open for the ITE Annual meeting in New Orleans from July 31st to August 3rd. Early bird pricing is open until June 10th.

Lastly, NCITE was featured in the May edition of the [ITE Journal](#)! See pages 18-20 for the full article, which highlights many of the great things our section is doing.

Thank you to our membership and to our various leaders who are critical to our operations for making NCITE a great organization to be a part of. Your continued involvement makes our section strong. I hope you are able to get outside and enjoy the nice weather, and I look forward to seeing you at our upcoming events!



Natalie Sager
2022 NCITE President

UPCOMING EVENTS

ite Calendar

ITE Calendar for District, Section, & Chapter Meetings

Stay Connected with Virtual Events
Online | Dates Vary



The 2022 Annual Meeting will be held in person at the
Duluth Entertainment Convention Center



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

SECTION MEETING UPDATES

The February Section Meeting was held on Wednesday February 16th 2022 and was a joint meeting with WTS-MN and NCITE. The meeting was an **Ethics Training** by **James Johnson** of Verdantas.

Highlights included:

- Jim led the training related to ethics and ethical situations that might occur while working in engineering and planning. This included an interactive component where attendees were asked how they would respond in certain situations.
- This training qualified for 2 PDHs for the PE license and 2 CMs for the AICP.

The March Section Meeting was held on Wednesday March 16th, 2022 as a virtual meeting sponsored by Econolite. **Brett Burfeind** and **Nicole Wilson** of Alliant presented on the **Twin Ports Interchange (TPI) Construction Staging and MOT in Duluth**.

Highlights included:

- The \$343 million, multi-year TPI Reconstruction Project reconstructs the I-35/I-535/US 53 interchange and the I-535/Garfield Avenue interchange in Duluth, MN. The project includes improvements to address and correct freight and safety issues caused by structural and geometric deficiencies. The project is being delivered via the Construction Manager/General Contractor (CMGC) alternative delivery method and leverages multiple Work Packages, allowing portions of construction to commence prior to all project design being completed.
- Brett and Nicole discussed the construction staging alternative analysis process and associated tools developed by the project team to identify the preferred staging alternative. They also presented on the final construction staging approach currently being implemented in the field, highlighting the design, traffic, and construction challenges faced by the project team, along with their associated design solutions. Lastly, they provided an overview of the CMGC alternative delivery method.

The April Section Meeting was held on Friday April 29th, 2022 as a hybrid meeting at Jax Café Minneapolis. **Paul Morris** of SRF presented on the **Northwest River Crossing Study**.



We continue to iterate the way we complete these meetings, and this time has been a perfect opportunity to try out some new things. However, if you have anything that may make these meetings work better or enhance the value for the section, we'd love to hear your thoughts! Please let any of your thoughts be known to a member of the board.

YMC UPDATE

In early March, the YMC went to Buck Hill in Burnsville to go snow tubing! It was a ton of fun and the hill even has their own bar, so we were able to get some refreshments in between our tubing runs.

April 21st, the YMC teamed up with the NCITE Complete Streets and Safety Committee to help clean up in Uptown Minneapolis. We walked along the Mall and the Midtown Greenway and picked up trash while discussing the pedestrian and biking infrastructure of the area. We ended up picking up way more garbage than we expected and went to LynLake Brewing afterwards to reward our hard work. It was a great way to celebrate Earth day and we had a great turn out.

Please reach out if you want more information on the events or upcoming things for the YMC. Our next event will be our May planning meeting where we will be planning out our classic Bike-Brewery event!



Lastly, both the shuttle and traffic signal communicate to cloud services via cellular communication to allow for monitoring of the system as well as a backup to the DSRC radios. A layout of the communications can be seen in Figure 2.

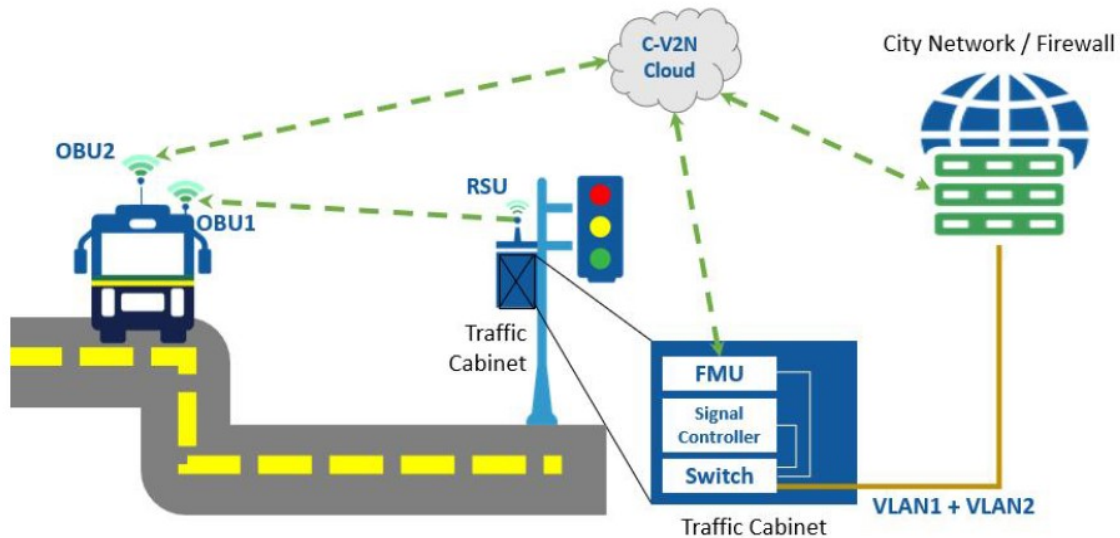


Figure 2: Communication Layout

The platform used for the connected vehicle technology for this project was from Applied Information Inc (AI), based out of Alpharetta, Georgia. Applied Information is a leading developer of Connected Vehicle ITS solutions. Applied Information's Glance Smart City Supervisory System™ platform allows cities to manage all their traffic and ITS assets on one web-based application. This system allows for connecting to and monitoring of key areas within an agency's existing infrastructure including traffic signals, school beacons, parking guidance system, mobile vehicle assets, and ITS devices. AI's Glance TravelSafely™ smartphone app connects drivers, and cyclists to an agency's infrastructure to allow the users of the roadway to receive Connected Vehicle Basic Safety Messages (BSM) along with SPaT data in a simple to use interface.

Regarding this project, Applied Information was able to provide a true turnkey connected vehicle system. Their hardware solutions include not only the OBU for the shuttle and the RSU for the intersection, but also the interface to interpret the SPaT messaging. One of the challenges in SPaT messaging is that the messages need to be verified and translated into what the motorist sees at the traffic signal indications in the field. A couple examples of this challenge include when older traffic signals are in flash. Here the flash circuit is controlled by a conflict monitor and the older traffic controller is unaware that the traffic signal is even in flash. If you were to monitor only the SPaT messages, you would see the traffic controller still displaying green indications. Applied Information deploys a Field Monitoring Unit (FMU) in the cabinet that is hardwired to the green indication outputs, and the flash circuits within the cabinet. The FMU verifies the SPaT messaging to ensure that the correct messages are being sent to the users of the system. Another example is in the case of a 5-section, protected-permissive, left turn head. The left turn indications only have an indication for the green and yellow arrow, no red indication. If you were to look at the SPaT messages in the controller when the head is not displaying a green or yellow arrow, it would tell you the left turn was red, even though there is no red indication. Permissive movements can be a challenge for this reason.

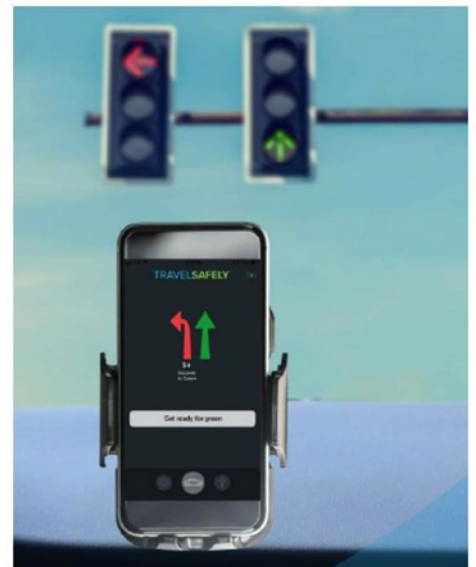


Figure 3: TravelSafely App

Supporting Technology: Behind the Scenes of the Rochester Autonomous Shuttle Project (continued from page 7)

This challenge is overcome via Applied Information's Glance, cloud-based software package. Glance allows users to program the correct indications and safety messages via an easy-to-use interface.

Glance was a key component that aided in the success of this project. Glance is a comprehensive smart city software system that allows for monitoring and alerting of the status of hardware in the field. In this project we used an integrated wired network, wireless (DSRC) radios, and cellular communications. Glance shows you the status of your complete network. This also allowed us to leverage AI's TravelSafely app, seen in Figure 3. This app combines Smart City solutions with advances in connected vehicle technology to create a network of knowledge that makes roads safer for motorists, cyclists, and pedestrians. With TravelSafely we have a connected vehicle interface that is easily downloadable from the Android or iOS app store to your smart device.



Figure 4: TravelSafely App

Lastly, I would like to thank our partners in this project. The connected vehicle landscape is evolving and can be difficult to navigate. In some cases, technology is changing faster than we can learn how to deploy. The acceptance of the public to this technology will help drive its application. It takes a team and leading DOTs to help continue to push the industry. These are not just cool new toys, but tools to help our traffic systems become safer and more efficient. To that I would like to thank the entities that were involved in this deployment including: Minnesota Department of Transportation, City of Rochester, Kimley Horn, SRF, and several more.



TECHNICAL COMMITTEE UPDATE



Geometric Design Technical Committee

The Geometric Design Committee is in need of a new Committee Chair. Any interested parties should contact Natalie Sager at Natalie.Sager@hdrinc.com



Intersection Traffic Control Technical Committee

Committee Chair: **Benjamin Brassler** - benjamin.brassler@minneapolismn.gov

Recent Agenda Items: No recent meetings.

Future Agenda Items: Traffic control devices and pedestrians.

Next Meeting: TBD



Emerging Technologies in Transportation Technical Committee

Co-Chairs: **Jake Eisinger** jake.eisinger@co.washington.mn.us **Zach Parsons** Zach.Parsons@boltonmenk.com

Recent Agenda Items: October 2021 Smart Work Zones.

Future Agenda Items: Autonomous Truck Mounted Attenuator (CDOT, MNDOT), Omaha CAV deployment, Bloomington Snow Plow Signal Priority, CAVe-In-A-Box.

Next Meeting: May 24th, Virtual for ATMA



Complete Streets and Safety Committee

Committee Chair: **Hannah Johnson** - HJohnson@alliant-inc.com

Recent Agenda Items: Earth Day cleanup (co-event with YMC) in April, Bellevue pedestrian and bicycle infrastructure in March.

Future Agenda Items: Potential topics include BRT, pedestrian toolkits, innovative project solutions, statewide pedestrian crash study, ped facility LOS, and more!

Next Meeting: Traffic control and pedestrian treatments (co-event with ITCC), details TBD.



Planning Methods and Applications Technical Committee

Committee Chair: **Krista Palmer** - kpalmer@srfconsulting.com

Recent Agendas Items: member updates, upcoming conferences, regional travel demand updates—Met Council, & INCITER article.

Future Agendas Items: Updates to regional network, Transit model updates, MnDOT model output check for reasonableness and post processing adjustments.

Next Meeting: TBD



Traffic Operation and Maintenance Discussion Group

Committee Chair: **Greg Boche** - greg.boche@woodburymn.gov

Recent Agenda Items: Tour of MnDOT Sign Shop, HP 360 Printer demo and Q/A with Grimco. 3M Pre-form LLC new thermoplastic product demo, 12" sample giveaway and product promotion!

Future Agenda Items: TBD

Next Meeting: 11:30 AM – 1:30 AM, Location TBD, Wednesday June 1st.



Simulation and Capacity Analysis Technical Committee

Committee Chair: **Michael Kondziolka** - mkondziolka@alliant-inc.com

Recent Agenda Items: Presentation on recent updates to the Traffic Analysis Toolbox – Volume III by Chung Tran, FHWA.

Future Agenda Items: TBD. If interested in presenting, please contact Mike Kondziolka.

Next Meeting: TBD in June, Alliant Engineering (733 S Marquette Ave, Unit 700, Minneapolis, MN)

The Data is In: Owners and Agencies Weigh in on 4-Lane to 3-Lane Conversions

Scott Poska, PE PTOE RSP1 & Shauna McIntire, PE | Alliant Engineering

In each issue, the INCITER features articles coordinated by NCITE's advertisers.
This article is a contribution from **Alliant Engineering**.

As active transportation increases, communities desire more livable spaces with pedestrian and bicycle facilities and transit options. While many modern roadways today include safety features for non-motorized users, many older facilities often lack these modern safeguards. Four-lane undivided highways have a history of relatively high crash rates for pedestrians and vehicles. Pedestrians are particularly vulnerable in four-lane undivided environments due to the double lane crossing threat. Four-lane conversion vehicle and pedestrian safety benefits are achieved by reducing the number of vehicle-to-vehicle conflict points, improving lines of sight, and prevailing speeds (Figures 1 and 2).

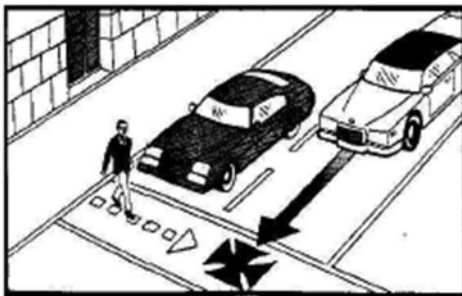


Figure 1: Pedestrian double-lane crossing threat

Alliant recently administered a survey among Twin Cities metro agencies regarding 4-lane to 3-lane conversions. The survey is part of a broader 4-lane to 3-lane conversion study currently underway with Hennepin County. The goal of the survey was to gain insight and understanding of how local agencies are treating 4-lane undivided roadways within their jurisdictions now and into the future. Alliant surveyed: MnDOT, Ramsey, Dakota, Anoka, Washington, and Scott Counties as well as the cities of Minneapolis, St. Paul, and Richfield.

The following is a glimpse into the survey questions and a summary of the responses.

Each respondent was asked about how many miles of 4-lane undivided highways are contained in their jurisdiction. Responses to this first question are summarized in the graph below, which shows the percent of total roadway miles that are made up of 4-lane undivided roadways for each jurisdiction.

Each survey recipient was asked if their jurisdiction constructs new or rebuilds existing 4-lane undivided roadways. Responses include:

- Jurisdiction does not construct or rebuild existing 4-lane undivided roadways. This standard is dictated by a written policy. (1 Respondent)

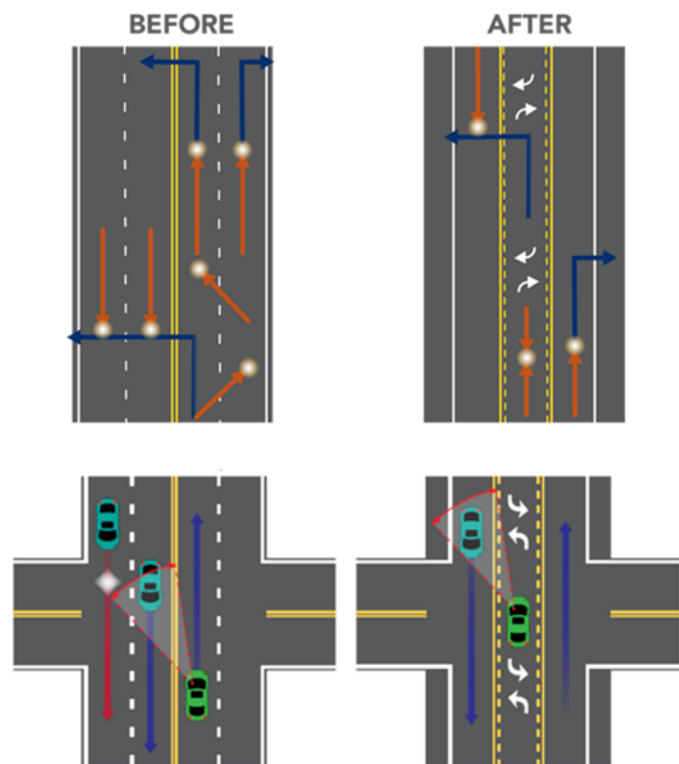


Figure 2: 4-lane vs 3-lane vehicle conflict points and left-turn sight distance

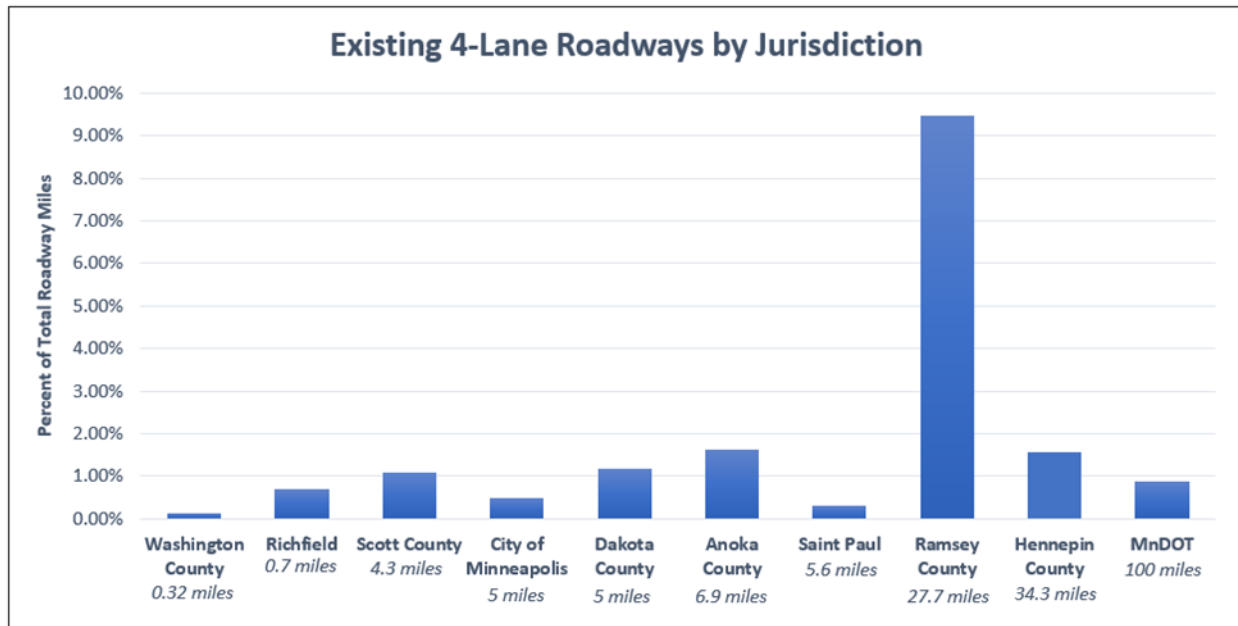


Figure 3: 4-lane roadway miles by jurisdiction

- Jurisdiction does not construct or rebuild existing 4-lane undivided roadways. This standard is not dictated by a written policy. (2 Respondent)
- Jurisdiction actively looks to convert existing 4-lane undivided roadways. (2 Respondents)
- Jurisdiction discourages constructing new or rebuilding existing 4-lane undivided roadways. (2 Respondents)
- Jurisdiction considers other roadway cross-section options before reconstructing an existing 4-lane undivided roadway. (2 Respondents)

When asked if there are current planning efforts for making modifications to 4-lane undivided roadways in the jurisdiction two respondents answered no, while the other seven respondents answered yes. Of the seven respondents that answered yes, decision factors for future 4-lane to 3-lane conversions varied:

- Agency-wide study of 4-lane undivided cross-sections (2 Respondents)
- Plan to evaluate 4-lane undivided cross-sections identified in the agency’s Comprehensive Plan (1 Respondent)
- Specific roadway conversion study (2 Respondents)
- Conversions are encouraged, but no specific implementation guidance is given (2 Respondents)

The survey concluded with a request for lessons learned from recent experience with roadway conversion projects. We identified the following themes from the responses:

- 4-lane to 3-lane conversions reduce crashes and operate well.
- Public engagement is a key to the success of a 4-lane to 3-lane conversion to ensure community members understand the value of this type of conversion.
- 3-lane sections may perform comparably to 4-lane segments in terms of operations (even at higher AADTs) and will have an added safety benefit.
- Enhanced pedestrian improvements should be considered for implementation with a 4-lane to 3-lane conversion based on the context of the segment. A 3-lane conversion without dedicated/upgraded pedestrian and bicycle infrastructure is of little use to non-motorized travel along the corridor.

As mentioned earlier, Hennepin County is actively reviewing county-wide 4-lane roadway conversion feasibility. Ramsey County completed a county-wide 4-lane roadway conversion feasibility review in 2020 and has

started programming and implementing roadway reconfigurations (primarily 4-lane to 3-lane conversions).

The results of the survey confirmed what many of us in the industry suspected, 4-lane to 3-lane conversions are an outstanding solution to implementing safety upgrades to 4-lane undivided highways. The survey also reinforces the need for active community engagement to educate the public to the benefits of conversion. A presentation including background on benefits and factors to consider for 4-lane to 3-lane conversions and how each jurisdiction undertook the study of their 4-lane roadways is planned for the 2022 Great Lakes District ITE Annual Meeting in Duluth.



Figure 4: Examples of recently completed 4-lane to 3-lane conversions completed by Alliant for Ramsey County



Blue Line Light Rail Extension Route Modification

Tim Klockziem, PE & Jack Olsson, PE | Kimley-Horn

In each issue, the INCITER features articles coordinated by NCITE's advertisers.
This article is a contribution from **Kimley-Horn**.

The Blue Line Light Rail Extension will run from downtown Minneapolis to Brooklyn Park, connecting some of our region's most diverse communities to jobs, education, and opportunities. In 2020, the Metropolitan Council and Hennepin County announced that the project would move forward without the use of the BNSF freight corridor, which made up a significant portion of the original locally preferred alignment for the project. While this was a setback, it also provided an opportunity to identify a modified route that could serve a more densely populated urban corridor through North Minneapolis. The new portion of alignment aimed to meet the following project goals:

- Improve transit access and connections to jobs and regional destinations.
- Improve frequency and reliability of transit service to communities in the corridor.
- Provide transit improvements that maximize transit benefits, while being cost competitive and economically viable.
- Support communities' development goals.
- Promote healthy communities and sound environmental practices including efforts to address climate change.
- Advance local and regional equity and work towards reducing regional racial disparities.

Because the new route is planned primarily within existing County roadways, traffic impacts were identified as a concern by several communities during the public engagement process. Accordingly, examining the impact of the new route alternatives on vehicle traffic was an important part of the evaluation for a new recommended route. Since the new route alternatives would not use an existing rail corridor, center-running light rail operations along existing roadways (in already constrained right-of-way) were analyzed to evaluate traffic impacts of the potential route alignments.

Kimley-Horn conducted traffic analyses along roadways near the route alternatives in various levels of detail. A large portion of the preliminary analysis focused on CR 81 in Crystal. The evaluation has investigated the impacts of the potential redesignation of two lanes on CR 81 from general purpose traffic use to light rail use. This redesignation would result in a change in the number of lanes for general purpose traffic from three in each direction to two in each direction to accommodate center-running light rail (see Figure 1).

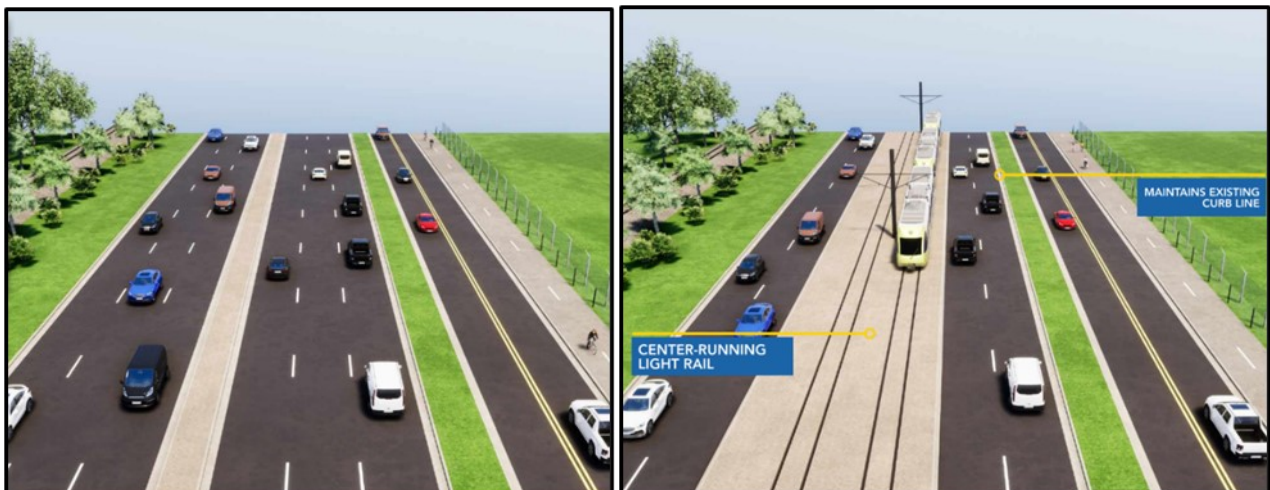


Figure 1: CR 81 in Crystal (left existing, right proposed)

Locations of bottlenecks in vehicular traffic were identified and several potential concepts to help reduce the impacts to traffic were analyzed, including potential grade separation of CR 81 at Bass Lake Road. VISSIM microsimulation software was used to model realistic integration of light rail at traffic signals along the corridor and to produce 3-D visualizations to communicate results of the analysis with public officials and the general public.

VISSIM was also utilized to evaluate and to create 3-D visualizations of center-running light rail on CR 81 in Robbinsdale (Figure 2). Due to the existing right-of-way and median space available on CR 81 in Robbinsdale, there are not anticipated to be as many impacts to the existing road geometry compared to CR 81 in Crystal.

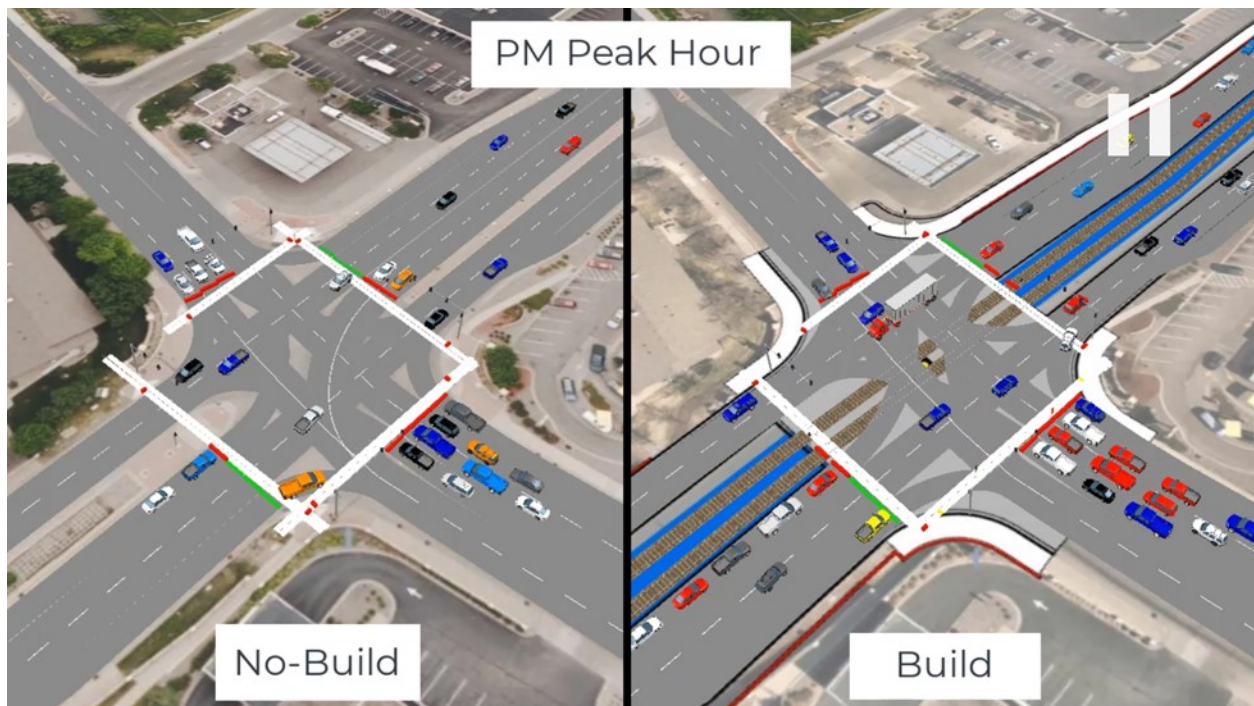


Figure 2: VISSIM Visualization of Center Running Light Rail on CR 81 in Robbinsdale

Traffic analysis was only one part of the overall route evaluation, but it was also a key piece in determining the viability of a preferred route. In April 2022, the METRO Blue Line Extension Report was released for public comment. As part of this report, the project recommended extending the Blue Line Route from Target Field to Brooklyn Park via W Broadway Avenue in Minneapolis and along CR 81 in Robbinsdale and Crystal (see Figure 3 on page 15). After a route is officially adopted by the Metropolitan Council, work on the design and environmental review will advance which will include additional detailed analysis of traffic along the entire corridor.

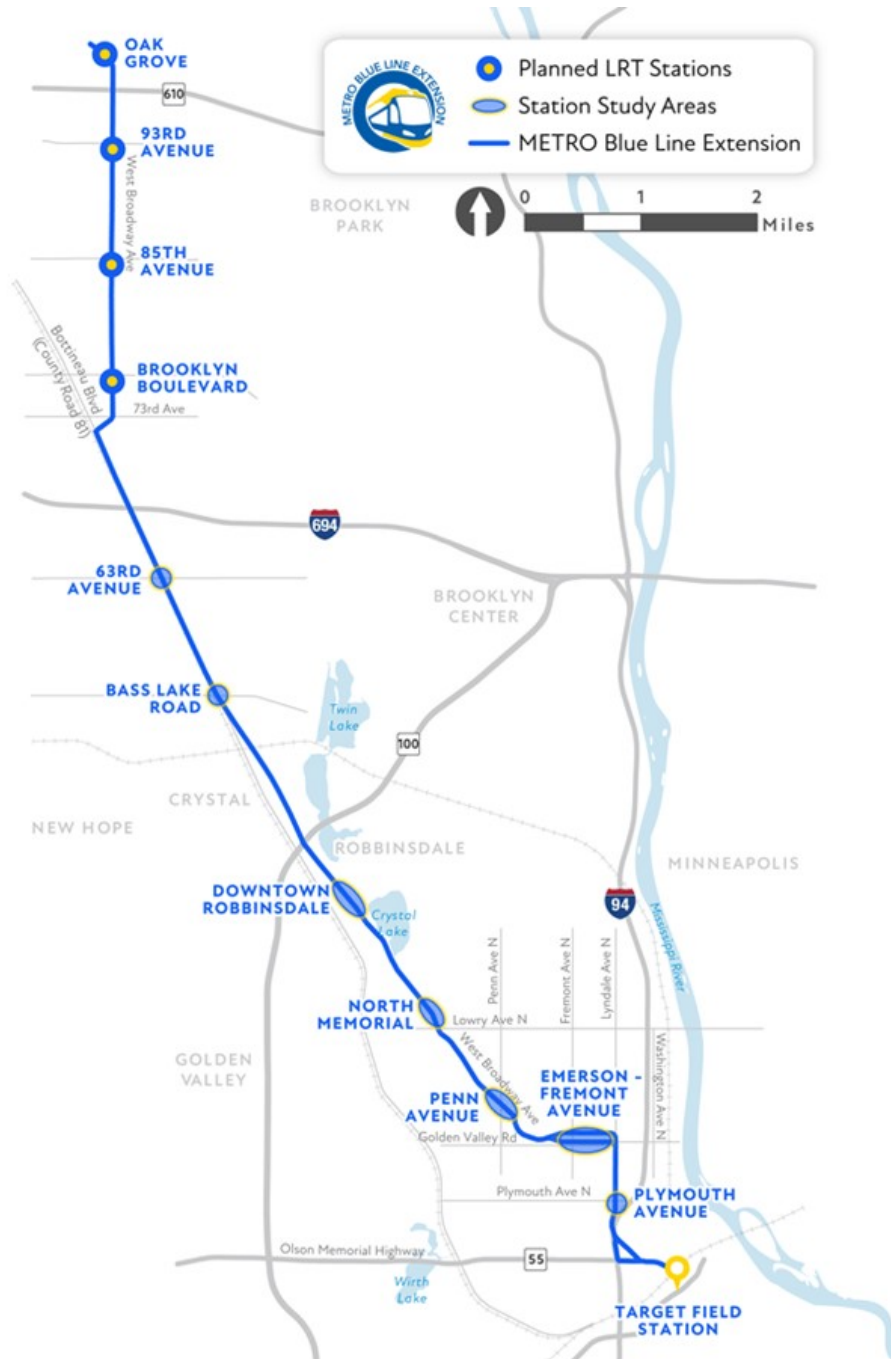


Figure 3: Blue Line Extension Recommendations

A Study on Changing Municipal Speed Limits

Tim Arvidson, PE | Stonebrooke Engineering

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

The issue of reducing speed limits to increase safety is an emotional, political, and controversial topic that has been debated by safety advocates, engineers, politicians, transportation officials, and the public for many years. A recent statutory change has put a spotlight on the topic, necessitating a deeper look into how speed limits are established and the effectiveness that lowering speed limits has on reducing vehicle traveling speeds. This article briefly details the history of speed limits, the recent statutory change, and the resulting effects on communities, as reported by Stonebrooke Engineering.

History of Speed Limits

MN Statute 169.14 has been in place for more than 80 years. It was enacted by the Minnesota State Legislature because the previous approach of allowing local agencies to set speed zones was determined to be a failure. When established locally, speed zones were not consistent from city to city, were widely ignored, and were thought to have been influenced more by local desires to generate revenue than considerations for safety.

By statute, speed limits were established for alleys, urban streets, local roads, expressways, and interstate highways. Where state or local authorities believe that the statutory limits would not be effective, the statute allows for speed zones to be established. Establishing a speed zone historically required that a study be conducted and that the Commissioner of Transportation approved the change.



Source: Pexels.com

2019 Statute Change

Minnesota Statute Section 169.14, subd. 2 was updated in 2019, by the Minnesota State Legislature. The change gave cities the authority to establish speed limits for streets under their jurisdiction, without conducting an engineering and traffic investigation and without approval by the Commissioner of Transportation.

The change was the result of a request by the city of Minneapolis, who wanted the ability to reduce speeds on local roads in an effort to improve pedestrian safety. While the state legislature agreed to the statute change, they also felt the authority should be granted to all Minnesota communities, not just Minneapolis.

A Study on Changing Municipal Speed Limits (continued from page 16)

What Does This Mean for Your City?

Prior to the change, the statutory speed limit in urban districts was 30 mph unless otherwise posted. Cities also had the option to set the limit to 25 mph if the change was adopted by the local road authority and was properly signed.

The revised statute maintains these limits and does not require any action by a community. The change does, however, afford communities the opportunity to change speed limits on roads under their jurisdiction without an engineering study and without approval by the Commissioner of Transportation. However, an engineering “analysis” based on national guidance is required, and previous statutory speed limits still exist.

While various other studies and speed change advocacy documents exist, the Federal “Manual on Uniform Traffic Control Devices” (MUTCD) is still the national standard. The MN MUTCD conforms to the current system as approved by the American Association of State Highway Officials and the national Manual on Uniform Traffic Control Devices.

The revised statute provides flexibility on implementing a change to a posted speed limit. Cities can now set speed limits on streets under their jurisdiction without conducting an engineering and traffic investigation provided that the city:

- Implement speed limit changes in a consistent and understandable manner.
- Erect appropriate signs to display the speed limit.
- Develop procedures to set speed limits based on the city’s safety, engineering, and traffic analysis. At a minimum, the safety, engineering, and traffic analysis must consider national urban speed limit guidance and studies, local traffic crashes, and methods to effectively communicate the change to the public.

Changing speeds limits is new to Minnesota, as there is insufficient data to support a conclusion as to whether or not it will improve pedestrian safety. To this end, it is strongly encouraged that communities track their results so additional evaluations and future recommendations can be performed.



Source: Pexels.com

Community-Driven Infrastructure Design: Engineering, Artwork, & History Combine in the Dale Street Bridge

Matt Christensen, PE, SE | TKDA

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This article is a contribution from **TKDA**.



Dale Street Bridge

When Ramsey County identified the Dale Street Bridge (CSAH 53) No. 9387 over TH 94 for replacement, the project objectives were driven by community needs as much as technical requirements. The completed project stands out because it features artwork and community space that honors the legacy of the predominately African-American Rondo Street neighborhood displaced by the freeway construction more than 60 years ago. Such a project required a unique approach to community engagement and a high degree of collaboration between Ramsey County, the engineering team, individual community members, community groups, artists, local businesses, and corporate participants.

Community-Driven Design Process

In February of 2016, Ramsey County and TKDA's team began an extensive 18-month public engagement process where much of the input highlighted the community's desire to celebrate and tell the story of the Rondo neighborhood's public gathering center that was located where the Dale Street Bridge currently resides. The subsequent community design workshops brought ideas for a vastly improved and unique pedestrian environment, while artists hired by the neighborhood developed a vision to tell the Rondo neighborhood story.

Community-Driven Infrastructure Design (continued from page 18)

Through the Saint Paul Springboard for the Arts organization, three local artists with deep Rondo ties, Mica Lee Anders, Hawona Sullivan Janzen, and GE Patterson, were chosen to review all the community input and develop the aesthetic design of the new bridge. Under the mentorship of well-known Saint Paul artist Seitu Jones, the art team landed on several design features to represent the Rondo community.

The remarkable role the community and artists played in bringing the new bridge to life led the engineering team to engage in an iterative and highly collaborative design process, walking along-side the people of this historic neighborhood as they sought to tell their story. This generated a dialog that fostered consensus balancing the community’s aspirations with the technical and financial boundaries of what was possible. The result is a piece of public transportation infrastructure transformed into a place of significant meaning to the community.

A Community Asset

The completed bridge is more than twice the width of the original. The sidewalks and barriers are 16-feet wide, a combination of a 10-foot walk area and a 6-foot barrier area reserved for future artwork. Drivers and pedestrians enjoy both the improved function and the artwork that runs from one end to the other.



Dale Street Bridge Art

The artwork includes “I am Rondo” written in 13 languages to represent the diverse communities in the neighborhood; a yellow acrylic railing that reads “We are Rondo”, symbolizing all who live or have lived in the neighborhood; and green acrylic insets that feature a Sankofa Acorn, symbolizing all that is new being nurtured and supported by all that has come before. Other features include an abutment wall with a map of the Rondo neighborhood in an eye-catching geometric pattern; barrier pilasters cast with images of original neighborhood homes; dancing leaves at the beginning and end of the sidewalks to represent the popular dance move, the Lindy Hop; large scale oak trees reminiscent of the canopy of oaks that once lined the streets of the Rondo neighborhood; and a poem, that spans the length of the bridge, etched into the sidewalks.



Dale Street Bridge Ribbon Cutting

The bridge itself features 17 30MH (high strength) pre-stressed concrete beams to support the deck and road, one of the first bridges in the State of Minnesota to incorporate this type of beam in its structure. In addition to the bridge replacement, the project reconstructed Dale Street between Inglehart Avenue and University Avenue. The design incorporates safety features like left turn lanes onto the eastbound and westbound TH94 ramps and upgraded lighting, while improving accommodation and mobility of pedestrians with a grade reduced to ADA standards.

With the presence of an artist’s approach to aesthetics on nearly every component of the bridge and new plaza-like pedestrian path, the reconstructed Dale Street Bridge is as much of a destination as it is an important vehicular and pedestrian crossing over a busy freeway.



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Source: xkcd

MEMBERSHIP UPDATE

New Members

Dr. Md Shakhawat Hossen, - WSB

Eden Rogers - Washington County Public Works

Michael Samuelson - Minnesota Department of Transportation

Peter D. Buchen

Duncan Schwensohn - City of Duluth Minnesota

Timothy Klockziem - Kimley-Horn

Austin Lovaas - KLJ Engineering

Patrick Cyrus Thompson - Minnesota Department of Transportation

Moves

KC Atkins - Hennepin County, formerly Short Elliott Hendrickson Inc.

Jason R. Junge - WSB, formerly Minnesota Department of Transportation

Renato Guadamuz - HR Green, formerly KLJ

Nicholas J. Erpelding - Hennepin County, formerly SRF Consulting Group

Mark T. Powers - KLJ Engineering, formerly SRF Consulting Group

New TPCB Certification Holders

Michael Larson - PTOE

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