GREAT LAKES DISTRICT

ite

NORTH CENTRAL SECTION

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# inciter

NEWSLETTER OF THE ITE NORTH CENTRAL SECTION


## THE FUTURE OF TOLLING: PAYING THROUGH THE VEHICLE

*Ben Nault | SRF Consulting*

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.




*Image Source: MnDOT, Driving with E-ZPass*

Toll tags have been part of driving in Minnesota for more than 20 years. MnPASS opened on I-394 in 2005, and on August 2, 2021, it became E-ZPass Minnesota, linking the state's express lanes to 19 other states, including North Carolina. Now the North Carolina Turnpike Authority (NCTA) is testing what could come after the windshield tag: paying tolls directly through the vehicle. This article looks at the technology behind it and what it could mean for agencies.

**Why Look Beyond the Transponder?**

A transponder is a small electronic tag mounted inside a vehicle's windshield. When the vehicle passes under an overhead structure called a gantry, antennas and readers detect the tag's unique serial number by radio signal and charge the prepaid account linked to it. In Minnesota's express lanes, the tag also has a switch. Drivers set it to either single- or high-occupancy status depending on how they should be tolled (or not).

*(continued on page 9)*

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# PRESIDENT'S MESSAGE

Greetings NCITE Members!

We are already heading into the final stretch of 2026, and the holiday season is approaching. I've had a lot to be thankful for as the 2026 NCITE President, especially seeing so many people stepping outside of their comfort zones to volunteer with the organization.

The past few months have been busy for NCITE, and it has been great to see our members connecting across the Section. We closed out the summer with several of our annual traditions. The third annual NCITE Golf Scramble brought 36 golfers and eight sponsors to Cedarholm Golf Course and raised nearly $2,000 for student scholarships, along with additional support for the Great Lakes District endowment. We also enjoyed our summer social with our industry partners and continued to see our technical committees and the Younger Member Committee create additional opportunities for members to connect throughout the year. These activities have become an important complement to our regular Section Meetings and are a big part of what makes NCITE a strong professional community.



***Joe DeVore,*** *2026 NCITE President*

Our fall Section Meeting schedule kicked off in August at Surly Brewing, where **Kelsey Larsen** and **Dena King** of Bolton & Menk presented on the Highway 10 Ramsey Gateway Project. With 27 in-person and two virtual attendees, the meeting was a great start to our regular programming after summer. In September, **Katy Kressin**, the Minnesota TZD West Central Regional Coordinator, and **Mike Martinez** of HDR introduced a crash foresight tool for identifying locations with elevated risk for fatal and life-changing crashes. They shared real-world applications and proactive countermeasures, showing how advanced analytics and predictive modeling can help agencies identify risks before serious crashes occur. October brought us to the University of Minnesota for the NCITE/ITSO Joint October Section Meeting, focused on the Highway 7 Queue Warning System. I appreciate these opportunities to connect professionals with our student chapters, introduce students to the profession, and help members meet the next generation of transportation professionals.

Beyond our Section Meetings, our committees have continued to provide opportunities for NCITE members to learn, network, and get involved. Our Younger Member Committee plays an especially important role in connecting young professionals through social and educational events, while our technical committees give members a place to exchange ideas and dig deeper into the issues affecting our profession. Several committee chair positions still need volunteers for 2027, so please let any NCITE Board member know if you are interested in becoming more involved.

I hope you will join us for the **2026 Annual Meeting on November 19** at BRK Through in Roseville. We will have an opportunity to reconnect with colleagues, recognize this year's scholarship and award recipients, welcome our incoming Board, support the scholarship program, and celebrate another successful year for NCITE. And with BRK Through's physical and mental challenge rooms, I expect there will be a little friendly competition mixed in as well!

As my year as NCITE President begins to wind down, I want to thank our Board, committee chairs, volunteers, presenters, sponsors, student chapters, and everyone who has attended or supported an NCITE event this year. Volunteer involvement has consistently been at the heart of what keeps NCITE moving forward, and 2026 has been no different. It has been a privilege to serve as your President this year. I look forward to seeing many of you at the Annual Meeting and finishing 2026 on a high note!

**Joe DeVore**, 2026 NCITE President

# UPCOMING EVENTS

## ITE CALENDAR FOR DISTRICT, SECTION, & CHAPTER MEETINGS

**Stay Connected with ITE Events**

ite Calendar

## NCITE CALENDAR

**Stay Connected with NCITE Events**

GREAT LAKES DISTRICT
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NORTH CENTRAL SECTION

## MN TRANSPORTATION CONFERENCE & EXPO 2027

**St. Paul, MN | March 24–25, 2027**

MTC&E 2027
MINNESOTA TRANSPORTATION CONFERENCE & EXPO

## 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

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

# SECTION MEETING UPDATE

The September Section Meeting was held on September 24, 2026 at **10 West End** in St. Louis Park, MN. **Katy Kressin** of Minnesota Toward Zero Deaths and **Mike Martinez** of HDR presented on "Statewide Foresight: Leveraging Predictive Analytics to Make Roads Safer for All Users".

The presentation introduced a GIS-based crash foresight tool developed by MnDOT and HDR that predicts where and when fatal and life-changing crashes are most likely to occur. Rather than relying only on roadway characteristics, the model combines negative binomial regression and Bayesian networks with driver-behavior factors such as speeding, unbelted occupants, impaired driving, and younger and older drivers to estimate risk for each highway segment. After an initial pilot, the model was expanded in 2025 to cover the state highway and county road system across Minnesota, and it is delivered through an ArcGIS Experience Builder application. The presenters demonstrated how enforcement, EMS, education, and engineering partners can use the risk scores to target countermeasures, including teen driver education in Grant County and focused State Patrol deployment, in support of the Safe System Approach and Toward Zero Deaths. You can watch the September Section Meeting Presentation **here!**




The October Section Meeting was held on October 15, 2026 at the **University of Minnesota Civil Engineering Building** in Minneapolis, MN, and was co-hosted with the University of Minnesota's student chapter, ITSO. **Nick VanGunst** of Alliant Engineering and **Jake Gasper** of MnDOT CAV presented on "MnDOT's Arterial Queue Alerting System", a project funded through MnDOT's Innovative Ideas Program.

The project used camera-based video analytics to detect vehicle queues in real time and trigger advance warnings at two sites. On TH 7 at Texas Avenue in St. Louis Park, a crest in the roadway limits sight distance to recurring queues and had contributed to hard braking, near misses, and rear-end crashes. On I-35 at the 5th Avenue West ramp in Duluth, the system activated a dynamic message sign during event-related queuing. The presenters shared system design, pre- and post-installation data, and lessons learned. The system worked as designed at both sites. On TH 7, hard braking persisted, crash rates did not initially decline, and speeds were only somewhat lower. In Duluth, drivers responded to the advance messaging and used alternate routes. The detection cameras also picked up wrong-way driving and pedestrian activity. You can watch the October Section Meeting Presentation **here!**





# YMC UPDATE

The NCITE YMC had a great time playing WhirlyBall in Bloomington on Wednesday, October 14th! Our thanks to everyone who made it!





Our last event of the year will be a happy hour from 4-5 PM on November 19th at the Applebee's Grill + Bar (1893 Highway 36 W, Lauderdale, MN) near the Rosedale Center mall. Come chat with YPs before the NCITE 2026 annual meeting!

**Do you have a fun event idea or want to help plan a YMC outing?**

Reach out to Blake (Blake.Andert@metrotransit.org) or Hannah (Hannah.DeBruin@hdrinc.com) to join the YMC planning committee! We meet a few times a year, usually at a brewery or restaurant, to coordinate on any upcoming events, and we would love to see you there!

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If you or a co-worker is interested in joining the Young Member Committee please visit the YMC Page on the NCITE Website here. If you are not receiving the YMC StarChapter emails, please reach out to Blake (Blake.Andert@metrotransit.org) or Hannah (Hannah.DeBruin@hdrinc.com) to get on the mailing list.

# STUDENT CHAPTER UPDATE - SDSU

The South Dakota State University (SDSU) Institute of Transportation Engineers (ITE) Student Chapter has had an active and successful start to the 2026-2027 academic year. The chapter continues to focus on professional development, industry engagement, student outreach, and leadership development while strengthening interest in transportation engineering across campus and throughout South Dakota. This year, SDSU ITE has maintained approximately 25 active members and has successfully recruited nine new freshman members who have been active participants in chapter meetings and events. Through technical presentations, professional networking opportunities, site visits, and educational outreach activities, the chapter has worked to connect students with practicing engineers while promoting transportation engineering to future generations of students.

**Professional Development and Industry Engagement:**

The chapter hosted multiple presentations from engineering professionals representing a variety of firms and transportation disciplines. On September 2, SDSU ITE partnered with the SDSU ASCE Student Chapter to host **Justin Christensen** and **Trent Bruce** of DGR Engineering, who presented on the Highway 75 Reconstruction Project in Sioux Center, Iowa. This joint meeting served as both a technical presentation and an opportunity to strengthen collaboration between engineering student organizations.



On September 16, **Matthew Crooke**, SDSU ITE's 2024-25 President and an Engineer-in-Training at Stonebrooke Engineering, returned to campus to discuss transitioning from college to a professional career. Students gained insight into the early stages of engineering careers, professional development, and workplace expectations.

On September 30, **Jake Folkeringa** and **Rich Uckert** of Bolton & Menk presented on Intelligent Transportation Systems (ITS), discussing the role of emerging technologies in modern transportation networks and traffic operations.



On October 14, **Ryan Murtha** of McLaury Engineering spoke about municipal engineering in rural communities, highlighting the challenges and opportunities associated with providing infrastructure improvements for smaller communities throughout the region.

**Technical Site Visit**

On October 13, five SDSU ITE members participated in a site visit hosted by the South Dakota Department of Transportation (SDDOT) at the new I-29 and 85th Street Interchange Project near Sioux Falls. Members had the opportunity to observe an active transportation construction project and gain firsthand knowledge of the planning, design, and construction processes involved in a major infrastructure improvement.





**Student Recruitment and Community Outreach**




Student outreach and recruitment have been major priorities for the chapter this semester. On August 23, SDSU ITE members participated in a College of Engineering student recruitment and welcome event for incoming students. Members discussed academic success strategies, course planning, extracurricular involvement, and opportunities within engineering student organizations. The event contributed to the recruitment of several new chapter members.

On September 17, the chapter participated in SDSU's One Day for STATE celebration as part of the College of Engineering Expo. Members engaged with community members, alumni, prospective students, and university supporters while promoting transportation engineering and sharing information about SDSU ITE activities. On October 2, SDSU ITE's President and Vice President represented the chapter and the Civil Engineering Program at the Civil Engineering Expo hosted at the Washington Pavilion in Sioux Falls. Through educational displays and conversations with middle school students, chapter leaders introduced students to civil and transportation engineering concepts while encouraging interest in STEM-related careers.




**Funding and Chapter Growth**

In Spring 2026, the SDSU ITE Student Chapter successfully applied for $2,400 and received $1,200 in funding from the SDSU Students' Association. The chapter plans to use these funds to support future professional development opportunities and help offset student travel expenses associated with regional ITE events and competitions. This support provides additional opportunities for members to participate in professional activities and engage with the broader transportation engineering community.

**Looking Ahead**

The chapter will conclude the fall semester with officer elections and planning activities for the upcoming year. Looking forward, SDSU ITE is exploring participation in the ITE Traffic Bowl and the formation of a Traffic Design Competition Team for future participation at the Missouri Valley District Regional Conference in Summer 2027. The chapter remains committed to providing students with professional development opportunities, strengthening relationships with industry professionals, increasing awareness of transportation engineering, and preparing members for successful careers in the engineering profession.

**Fall 2026 Highlights:**

- Approximately 25 active members
- 9 new freshman members recruited
- 4 professional industry presentations
- 1 joint meeting with SDSU ASCE
- 1 transportation project site visit
- 3 student recruitment and outreach events
- $1,200 awarded by SDSU Students' Association

SOUTH DAKOTA STATE UNIVERSITY

*The Future of Tolling: Paying Through the Vehicle (continued from page 1)*

The system has served tolling well, but there are three general pressures weighing on the system as it stands.

- Serial numbers are running out. The serial number format is fixed in the system, which limits how many tags can be issued.
- Frequency interference is growing. The radio frequency was not well defined at the time the technology was first deployed, and agencies are now seeing interference from sources such as cell phones and baby monitors.
- Infrastructure is expensive. Roadside readers, gantries, and the systems behind them cost a great deal to build and maintain.

None of these issues keep the current system from working today, but when combined, they make a case for developing the next approach.

**How the NCTA Pilot Works**

NCTA is implementing a pilot study to move from transponders to an in-vehicle payment model where the vehicle itself becomes the payment device. Enrolled drivers link their vehicle identification number (VIN) to a payment method. When the vehicle drives through a tolled section of roadway, the payment is processed automatically through the vehicle's infotainment system. There is no transponder to buy, mount, or replace.

The pilot is small by design. It includes up to 100 drivers of Volvos equipped with Google built-in infotainment systems, and it is set to begin on North Carolina Turnpike toll roads later this year. NCTA's key partners are Volvo and Mastercard. Volvo is working to integrate the system into its vehicles and Mastercard is helping to process the transactions.

NCTA describes the pilot as a first step toward vehicle-to-everything (V2X) technology. The approach is meant to expand to other manufacturers and other tolling agencies over time. NCTA also sees possible uses beyond tolling, in services such as fast food, car washes, and parking.

**A Partnership Approach**

In-vehicle payment depends on vehicle manufacturers (OEMs) building the needed hardware and software into their vehicles. That makes the effort a public-private partnership from the start, and each partner has a different reason to take part. Agencies could remove ticketing and tag distribution systems, much like transit agencies moving toward tap-to-pay. Drivers gain convenience by removing a device to manage. OEMs can gain some revenue from the service and remove objects from their cabins, like transponders. In the past, OEMs have been sued over objects, like transponders, turning into projectiles. Aligning these interests may prove as challenging as the engineering of the technology.




*Tolling Activation Through the In-Vehicle Payment Model*
*Image Source: NCDOT Turnpike, In-Vehicle Payment Pilot*

**Conclusion**

The NCTA pilot is small and still ahead of launch, but it shows an avenue where tolling may be heading with E-ZPass, and Minnesota, by shifting payment from a device the driver installs to a service built into the vehicle. Getting there will take agencies, automakers, payment providers, and technology companies sharing responsibility for the result. For Minnesota, where toll lanes utilize E-ZPass technology and drivers have used toll tags for two decades, the outcome of pilots like this one is worth watching.

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

# EVALUATION OF REST IN RED SIGNAL OPERATIONS

*Zachary Einck, PE, RSP1 | HDR*

*Richard Storm, PE, PTOE | HDR*

## Background

Rest in Red (RIR) is a traffic signal phasing technique typically used during overnight low-volume operations (10pm-5am). The signal "rests" in all-red for all approaches, and it will change to green when a vehicle approaches the intersection. The intent is to limit extreme speeds that might exist on a corridor.

Ramsey County, MN, implemented Rest in Red in an effort to reduce overnight speeding on a county road corridor that otherwise rests in green. The County partnered with MnDOT to evaluate the effects to vehicle speeds due to Rest in Red implementation. HDR and the University of North Carolina Highway Safety Research Center performed this evaluation as part of MnDOT's Traffic Safety Strategy Evaluations project. Red-light violation data is still being investigated as part of this study. Crash data was not evaluated due to lack of post-implementation data but will likely be studied in the future.

Rest in Red was able to achieve its goal of reducing vehicle speeds.

## Approach Speed

A before-after analysis was performed for three Rest in Red treatment sites to evaluate whether vehicle approach speed distributions changes after RIR implementation. Median approach speeds decreased from 36.6 mph before to 33.0 mph after implementation, which is a 9.8% reduction.




*Rest in Red Treatment and Control Locations*

*Approach Speed Summary*

| Measure | Before Speed | After Speed | Change | % Change |
|---|---|---|---|---|
| **Overall median approach speed** | 36.6 mph | 33.0 mph | -3.6 mph | -9.8% |

Quantile regression was used to estimate median speed changes and 85th-percentile speed changes. Analyses were conducted by intersection and travel direction. Approach speeds generally decreased after RIR implementation. Reductions in both median and 85th-percentile speeds were observed at most approaches.

*(Continued on page 11)*

*Evaluation of Rest in Red Signal Operations (continued from page 10)*

*Change in Median and 85th Percentile Approach Speed*

| Intersection & Direction | Median mph Before RIR/After RIR | Change | 85TH Percentile mph Before RIR/After RIR | Change |
|---|---|---|---|---|
| **Silver Lake & Mississippi *Northbound*** | 42.0 mph/35.0 mph | **-7.0*** ** | 47.0 mph/40 mph | **-7.0*** ** |
| **Silver Lake & Mississippi *Southbound*** | 32.0 mph/31.0 mph | -1.0 | 37.0 mph/35.0 mph | **-2.0** ** |
| **Silver Lake & Rice Creek *Northbound*** | 33.9 mph/35.0 mph | +1.1 | 38.1 mph/39.0 mph | +0.86 |
| **Silver Lake & Rice Creek *Southbound*** | 35.0 mph/31.0 mph | **-4.0*** ** | 42.0 mph/37.0 mph | **-5.0*** ** |
| **Silver Lake & Innsbruck *Northbound*** | 34.0 mph/29.0 mph | **-5.0*** ** | 40.0 mph/38.0 mph | **-2.0** ** |
| **Silver Lake & Innsbruck *Southbound*** | 34.0 mph/25.0 mph | **-9.0*** | 42.0 mph/35.0 mph | **-7.0*** ** |

*Significance: *** p < 0.001 | ** p < 0.01 | * p < 0.05 | p < 0.10*

**Midblock Speed**

Midblock speed data included both Rest in Red treatment sites and control sites. This allowed comparison of before-after speed changes between the two site types. The objective was to determine whether midblock speeds changed after RIR implementation and whether the change differed between treatment and control sites. The speed limit is 40 mph for both the treatment and control corridor.

*Midblock Speed Descriptive Comparison*

| Comparison | Before | After | Change | % Change |
|---|---|---|---|---|
| **Treatment-site mean speed** | 40.6 mph | 38.0 mph | -2.6 mph | -6.4% |
| **Control-site mean speed** | 40.6 mph | 39.1 mph | -1.5 mph | -3.7% |

Midblock speeds decreased after implementation at both treatment and control sites. The reduction was larger at treatment sites than at control sites, suggesting a RIR-related reduction in midblock speeds.

A binary logistic regression model was developed to analyze midblock speeds based on speeding above 40 mph. It found that midblock speeds over 40 mph were reduced after implementation of RIR.

*Binary Logistic Regression Model for Midblock Speeding (above 40 mph)*

| Parameter | Estimate | Std. Error | p-value | Outcome |
|---|---|---|---|---|
| **{Intercept}** | 0.0902 | 0.0293 | 0.0021** | N/A (baseline) |
| **Period – After (vs Before)** | -0.6188 | 0.0357 | <0.001*** | 46% less likely to speed in after period |
| **Site – Treatment (vs Control)** | -0.0597 | 0.0339 | 0.0787 | 5.8% less likely to speed compared to control sites |
| **Direction – SB (vs NB)** | -0.1145 | 0.0333 | 0.001*** | 10.8% less likely to speed for SB drivers |

*Significance codes: *** p<0.001, ** p<0.01*

*(Continued on page 12)*

*Evaluation of Rest in Red Signal Operations (continued from page 11)*

An additional ordinal logistic regression model was developed to analyze midblock speeds based on different speed categories:

- At or below the speed limit: <= 40 mph
- Less than 5 mph over the speed limit: 40-45 mph
- 5-10 mph over: 45-50 mph
- 10-15 mph over: 50-55 mph
- More than 15 mph over: 55+ mph

*Ordinal Logistic Regression Model for Midblock Speeding Categories*

| Predictor | Coefficient | Std. Error | Odds Ratio, exp(B) | Interpretation |
|---|---|---|---|---|
| **Period After** | -0.7426* | 0.0337 | 0.48 | 52.4% lower odds of being in a higher speeding category |
| **Treatment Site** | -0.2046* | 0.0317 | 0.82 | 18.5% lower odds of being in a higher speeding category |

**p<0.05*

After implementation, vehicles had around 52% lower odds of being in a higher speeding category. Vehicles at treatment sites had 18% lower odds of being in high speeding categories than compared to vehicles in control sites. The estimated period effect became stronger at more severe speeding levels, suggesting that the reduction may have been particularly pronounced for higher-speed violations

**Key Findings**

The analysis of before-and-after speed data, as well as the corresponding models, demonstrated that Rest in Red treatment succeeded in the goal of reducing speeds, particularly high-end speeding.

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

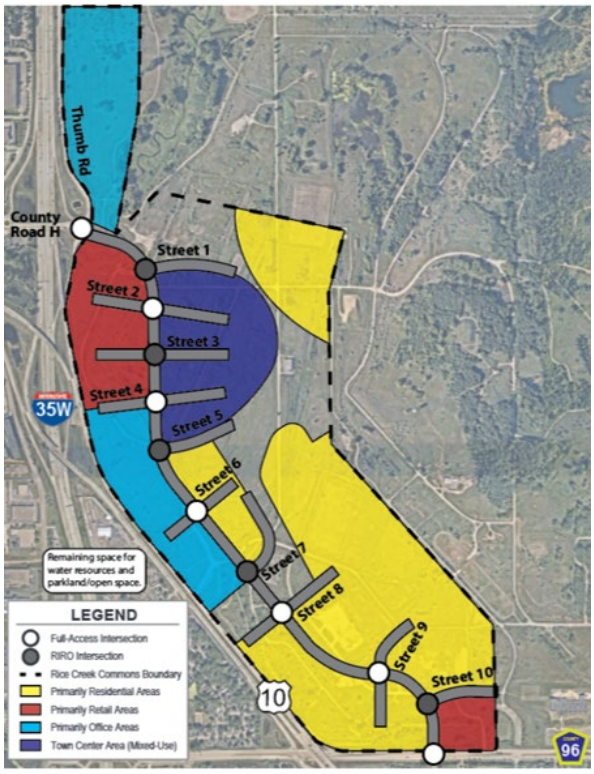
# RICE CREEK BOULEVARD:

# PLANNING FOR GROWTH FROM THE OUTSIDE IN

*Ethan Scowcroft, PE | Kimley-Horn*

The former Twin Cities Army Ammunition Plant (TCAAP), a largely vacant 2,370-acre site east of I-35W and north of Highway 96 in Arden Hills, MN, has drawn redevelopment interest since the plant ceased production in the 1980s. Ramsey County purchased 427 acres of the site in 2013 for a planned mixed-use redevelopment named Rice Creek Commons.

With site demolition and remediation complete, the County is preparing to construct the development's central roadway, Rice Creek Boulevard. The approximately 1.6-mile roadway will connect Highway 96 to the County Road H / I-35W interchange, with a bridge over Rice Creek near the site's northern edge and ten planned local roadway connections.




*Rice Creek Commons Map. Source: Kimley-Horn*

**Understanding Development Traffic Needs**

The redevelopment of the site presents a unique case in which a new major roadway connection is being designed in an undeveloped area to reflect the anticipated urban context. The roadway design needs to balance the traffic demands of the development with bicycle and pedestrian mobility to support a multimodal, mixed-use environment.

The Rice Creek Commons development is projected to include 300,000+ square feet of retail space, 800,000+ square feet of non-retail commercial space, and 1,900+ residential units throughout the 427-acre parcel. Analysis of site trip generation indicated the development could draw more than 34,000 new vehicle trips each weekday, after accounting for internal capture and multimodal trips. Background trips, such as vehicles rerouting to avoid congestion along I-35W, were also considered.




*Area Traffic Data. Source: Kimley-Horn*

Rice Creek Boulevard was originally envisioned as a four-lane roadway throughout the site. However, based on the most recent development metrics, the AADT along Rice Creek Boulevard is projected to range from 13,000 vehicles per day near the southern end of the site to 19,000 near the northern end. Therefore, a four-lane cross-section was identified as a necessity only in the northern portion of the development, while a two- or three-lane cross-section is expected to suffice throughout the remainder of the development, minimizing the roadway's footprint.

*(Continued on page 14)*

*Rice Creek Boulevard (Continued from Page 13)*

**Setting the Stage: Regional Transportation Improvements**

In preparation for the TCAAP site redevelopment and the large increase in traffic activity in the area, numerous transportation improvements have been completed in recent decades. Some of the major projects that have been completed by MnDOT and Ramsey County include:

- A grade-separated interchange at Highway 96 / Highway 10 was completed in 2014.
- Highway 96 / I-35W was reconstructed as a diverging diamond interchange in 2015.
- County Road H was reconstructed in 2017 with intersection improvements at Mounds View Boulevard and multilane roundabouts at the I-35W ramp terminals.
- The I-35W / County Road I interchange was reconstructed with roundabouts in 2018.

**A Tailored Approach to Internal Intersection Control**

With the external roadway network largely prepared for redevelopment efforts, the focus turned to the design of the transportation network within the site. Intersection control alternatives were evaluated at each major internal intersection using twelve key metrics that were developed to represent the overall goals of the Rice Creek Commons development. The metrics evaluated multimodal accommodations, safety, vehicle capacity, and other considerations.

| Intersection Control Type | Multimodal Accommodations | | | Safety | | Vehicle Capacity | | | Other Considerations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Exposure Speed | Crossing Exposure | Audible/Visual Signal | Conflict Points | Severe Crash Risk | Peak Hour Delay | Overall Operations | Resiliency | Construction Cost | Maintenance | Greenhouse Gas Emissions | Network Consistency |
| 2x1 Roundabout | | | | | | | | | | | | |
| Single-Lane Roundabout | | | | | | | | | | | | |
| Traffic Signal | | | | | | | | | | | | |

*Intersection Control Evaluation Matrix Example. A 2x1 roundabout was the selected alternative.*

Roundabouts were found to perform well across most categories and offer significant advantages in multimodal accommodations and safety compared to traffic signals. It was ultimately determined that roundabouts most closely align with the goals of the Rice Creek Commons development. The selected traffic control along Rice Creek Boulevard includes a 2x1 roundabout along a four-lane section in the north and two single-lane roundabouts farther south, with all other intersections being stop-controlled.

**Looking Ahead**

The design of Rice Creek Boulevard balances the operational, safety, multimodal, and financial considerations to best align with the goals of this unique development. The final design process is currently underway and construction is slated to take place in 2027-2028. The construction of Rice Creek Boulevard will represent a major milestone for one of the largest developments in the Twin Cities, with its central roadway being a critical factor in the overall success of the development.

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

# CHATEAU ROAD RECONSTRUCTION: BALANCING ACCESS, PRESERVATION, AND GROWTH IN THE NORTH DAKOTA BADLANDS

*Adam McGill, PE | KLJ Engineering*

*Joe DeVore, PE, PTOE, RSP2 | KLJ Engineering*

In western North Dakota, Chateau Road serves as the primary access route to some of the state's most recognized destinations, including the Medora Musical, Theodore Roosevelt National Park, and Theodore Roosevelt Presidential Library. As tourism grows, the corridor has become an increasingly important transportation link for residents, visitors, emergency responders, and businesses. The Chateau Road Reconstruction project demonstrates how complex transportation improvements can support growth while preserving the environmental and historic character of the Badlands.

**Background**

Located within the rugged terrain of the North Dakota Badlands, the project presented challenges well beyond a typical roadway reconstruction. Steep slopes, landslides, unstable terrain, and poor soils required careful evaluation throughout design and construction. At the same time, Chateau Road needed to remain operational because it provides the only access to several major tourism destinations and community assets.



*Aerial view of Chateau Road. Source: Brian Sevart, KLJ Engineering*

The project focused on creating a safer, more reliable corridor capable of accommodating future traffic while maintaining the area's unique character. An accelerated schedule added complexity, requiring the team to balance transportation improvements with environmental stewardship, public expectations, historic preservation, and constructability.

Extensive stakeholder coordination was critical. The project involved collaboration among the North Dakota Department of Transportation, Federal Highway Administration, Billings County, City of Medora, cultural resource agencies, local stakeholders, and adjacent property owners. This coordination helped address competing priorities while maintaining progress under a compressed schedule.

**Historical and Environmental Context**

The corridor passes near several significant cultural resources, including the Chateau de Mores State Historic Site, which is listed on the National Register of Historic Places. The team also worked to avoid or minimize impacts to the Medora Cemetery and Badlands Cantonment Historic Site. These resources required additional investigation, environmental review, design refinement, and ongoing agency coordination.

Protected species and habitat considerations also required environmental studies, mitigation planning, and regulatory coordination. These considerations were incorporated directly into project decision-making to advance needed transportation improvements while protecting sensitive resources.

*(Continued on page 16)*

*Chateau Road Reconstruction (Continued from Page 15)*

**Evaluating the Alignment**

Several alignment alternatives were evaluated based on project schedule, roadway profile, horizontal curve speeds, roadway width, landscape preservation, ridgeline requirements, pedestrian accommodations, and construction cost.

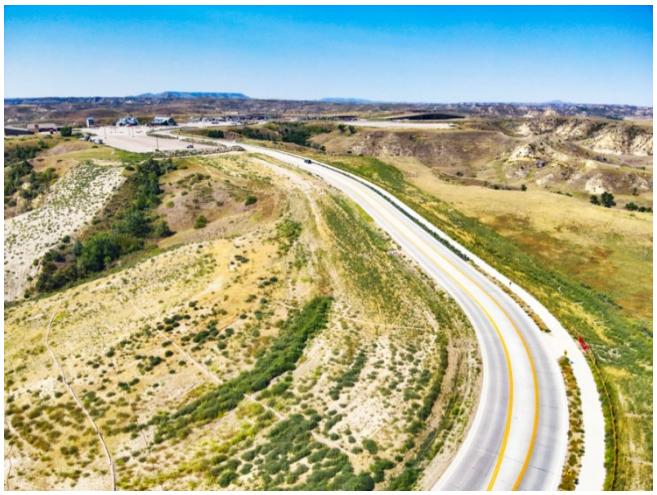
Existing grades ranged from approximately 8% to 12%, creating challenges for RVs, campers, and trucks traveling through the corridor. Reducing grades also required balancing substantial roadway cuts against the desire to preserve the surrounding Badlands landscape.

The selected alignment reduced the maximum grade to 9.5% while improving several tight horizontal curves and sightlines. The design also accommodated an expanded three-lane roadway and shared-use path. A raised crosswalk was incorporated where the trail transitions across the roadway, supporting pedestrian connectivity within the constrained terrain.

**Building Resiliency and Reliability**

The reconstructed corridor provides safer, more reliable travel, improved emergency access, enhanced year-round mobility, and greater capacity to support visitation to Medora's regional attractions.

Ultimately, Chateau Road demonstrates the value of integrating engineering, environmental services, surveying, right-of-way coordination, public engagement, and stakeholder collaboration. By addressing geotechnical challenges, protecting cultural and environmental resources, maintaining access, and advancing improvements within a demanding schedule, the project provides a more resilient corridor while respecting the landscape and history that make the Badlands unique.



*Aerial View of Chateau Road. Source: Brian Sevart, KLJ Engineering*



*Travelers Utilizing Chateau Road. Source: Brian Sevart, KLJ Engineering*

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This article is a contribution from **Michael Baker International**

# RETHINKING I-94: A DATA-DRIVEN INDEPENDENT REVIEW

*Sajid Raza, PE | Michael Baker International*

*Jaimison Sloboden, PE | Michael Baker International*

*Tonny Hoffmann | Michael Baker International*

## Project Background

Interstate 94 between Minneapolis and St. Paul is more than a highway. The 7.5-mile corridor is a vital regional connection, a route to homes, jobs, businesses, schools, and a defining feature of the Twin Cities landscape. Built in the 1960s, it also reflects a history of communities displaced and neighborhoods divided.

More than 60 years later, MnDOT and the FHWA initiated Rethinking I-94, the first comprehensive review of the corridor since its construction. The study examines 10 alternatives, ranging from maintaining or expanding the freeway to replacing it with an at-grade boulevard.

With so many possible futures, one question rises above the rest: How much traffic does I-94 carry, who is using it, and what would happen if the corridor's freeway capacity were reduced or removed?




*Rethinking I-94 — Minneapolis to St. Paul. Source: MnDOT*

## Independent Traffic Review

To help answer these questions, MnDOT engaged Michael Baker International to conduct an independent review of traffic data, travel patterns, and forecasting methods. The work was completed by Michael Baker's transportation planning and traffic engineering team, in collaboration with Replica specialists.

The team examined 10 years of continuous traffic detector data, studied origin and destination patterns using Replica mobility data, and reviewed the Twin Cities Regional Model used to forecast future conditions. The analysis also considered questions central to the public discussion, including traffic evaporation, induced demand, freight movement, and the effect of special events.

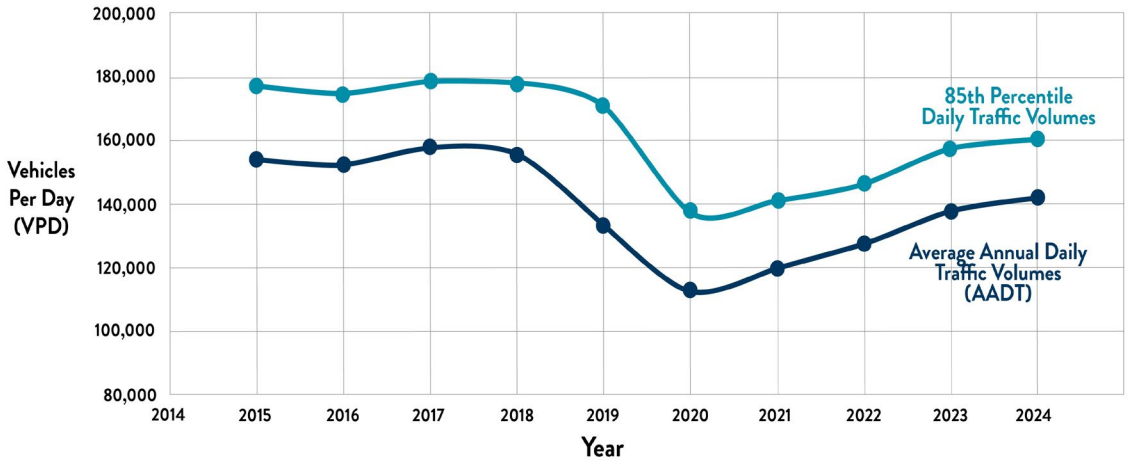
The goal was not simply to count vehicles. It was to understand how I-94 functions as part of the larger transportation system and how each alternative could affect local and regional mobility.

## The Traffic "DNA" of I-94

At the Victoria Avenue count station, near the midpoint of the corridor, the team analyzed daily traffic patterns for over a decade. The results showed that the corridor's recent traffic volumes are part of a longer recovery from the COVID-19 pandemic, rather than a new historical peak.

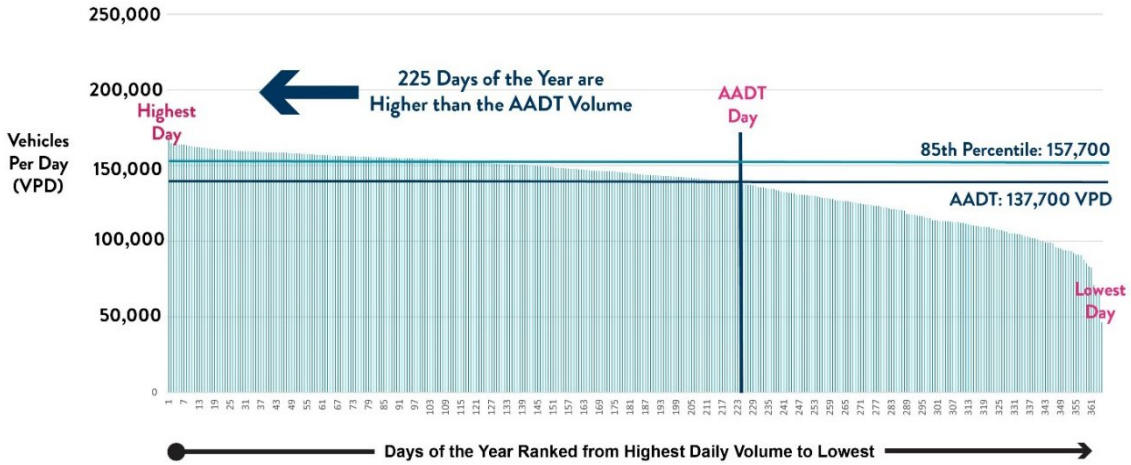
(Continued on page 18)

*Rethinking I-94 (Continued from Page 17)*




*Historical AADT and 85th Percentile Daily Traffic Volumes at I-94/Victoria Ave (2015–2024)*

Observed traffic volumes varied considerably by day, reaching nearly 168,000 vehicles on the highest-volume day in 2023. At Victoria Avenue, AADT was approximately 137,700 vehicles per day, yet actual traffic exceeded that value on 225 days, or more than 60 percent of the year. The 85th-percentile daily volume was approximately 157,700 vehicles, nearly 15 percent above AADT. These findings show why alternatives should be evaluated against recurring high-demand conditions, not AADT alone. Predictable surges associated with sporting events, the Minnesota State Fair, and major concerts further reinforce the need to consider the corridor's full range of recurring demand.



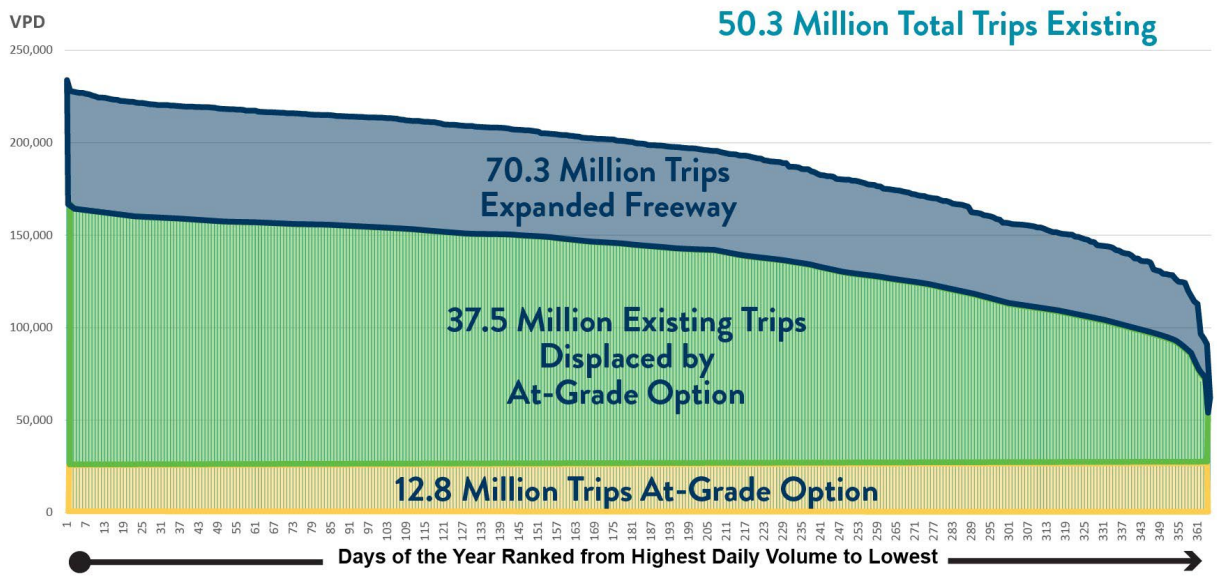

*Ranked Daily Traffic Volumes at I-94/Victoria Ave (2023)*

The analysis was then extended to annual trips. Approximately 50.3 million vehicle trips passed the Victoria Avenue detector location in 2023. Under the at-grade alternative, the estimated annual capacity at that location is approximately 12.8 million trips. That difference represents 37.5 million existing annual trips that would need to change routes, modes, travel times, destinations, or travel behavior. By comparison, the expanded freeway alternative is projected to accommodate approximately 70.3 million annual trips — an increase of approximately 40% above existing volumes.

Framed this way, the choice between alternatives is not merely a question of roadway geometry or community design. It is a question about the future of 37.5 million annual travel decisions — made by commuters, shoppers, students, freight operators, and event-goers — who currently depend on this corridor.

*(Continued on page 19)*

*Rethinking I-94 (Continued from Page 18)*

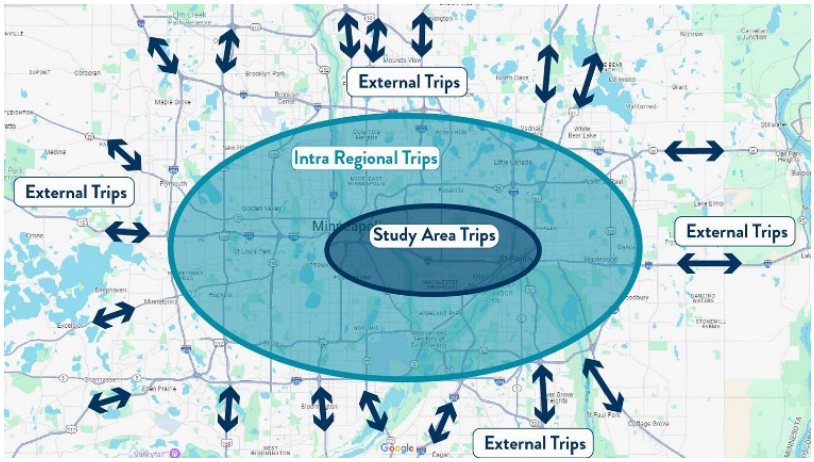



*Ranked Daily Traffic Volumes at I-94/Victoria Ave (2023)*

**Who Uses I-94**

Replica mobility data added another dimension to the review by showing where trips begin and end and how travelers interact with I-94. The analysis showed that approximately 80 percent of trips use the freeway, while the remaining 20 percent cross the corridor without entering it. About 90 percent of trips begin or end within the study area, indicating that I-94 serves local destinations as well as regional travelers. Only about 10 percent pass through without stopping in the study area.

The trip purpose analysis showed that I-94 is not simply a commuter route. Work trips represented 25 percent of study area trips using I-94. Other trips included home-based travel, shopping, commercial activity, dining, social activities, and school trips. The corridor therefore supports a wide range of daily activities and travelers.




*Trips Classification*

**A Data Informed Future**

Together, the traffic data, Replica analysis, and travel demand model show that the corridor serves both local destinations and regional travel, supports freight and event activity, and carries demand that cannot be understood through a single average daily traffic. The independent review provided the MnDOT with a clearer technical basis for evaluating alternatives and highlighted I-94's role as a corridor that supports both local and regional travel.

# TECHNICAL COMMITTEE UPDATE



**Capacity, Planning, and Analysis Technical Committee**
Co-Chairs: Sajid Raza, Erik Kappelman, Brett Gunderson
Recent Agenda Items:
Future Agenda Items: TBD
Next Meeting: TBD



**Complete Streets and Safety Committee**
Co-Chairs: AJ Fisher, Uthej Vattipalli
Recent Agenda Items: Active Transportation Discussion, MnDOT School Zone Speed Limit Guide
Future Agenda Items: TBD
Next Meeting: TBD



**Emerging Technologies in Transportation Technical Committee**
Co-Chairs: Ben Nault, Nathan Wade
Recent Agenda Items: Using ATSPM for Daily Traffic Signal Operations
Future Agenda Items: TBD
Next Meeting: TBD



**Intersection Traffic Control Technical Committee**
Co-Chairs: Michael Odell, Naveen Mallipaddi
Recent Agenda Items: ITCC 2026 Brainstorming Session, Complaint Resolution and Asset Management Discussion, Queue Warning System Discussion, Signal Timing Survey Discussion
Future Agenda Items: TBD
Next Meeting: TBD



**Traffic Operations and Maintenance Discussion Group**
Chair: Greg Boche
Recent Agenda Items: Signal Anchor Bolt Discussion, MnDOT RTMC Visit
Future Agenda Items: TBD
Next Meeting: TBD

## 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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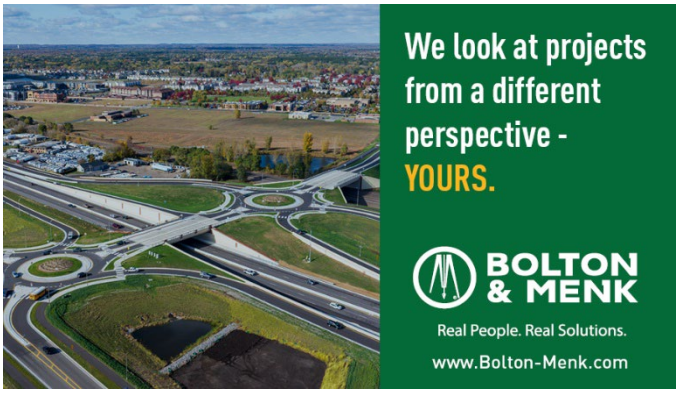
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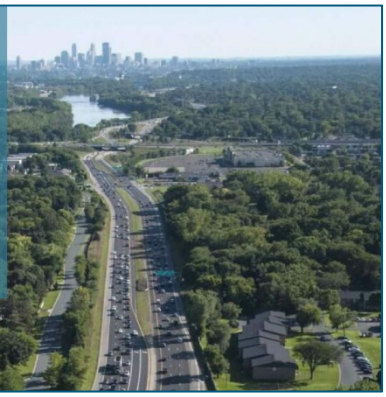

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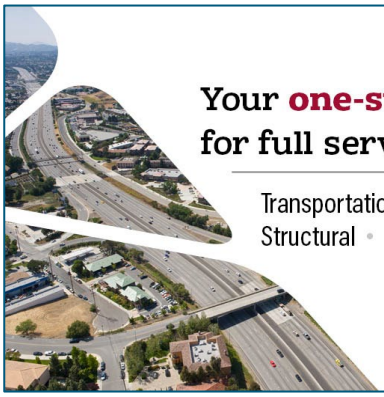
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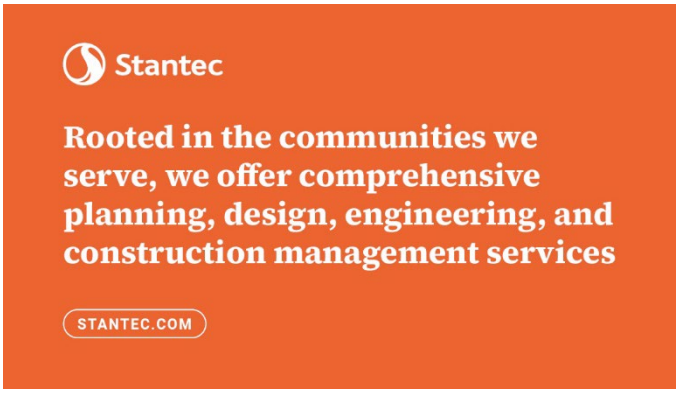
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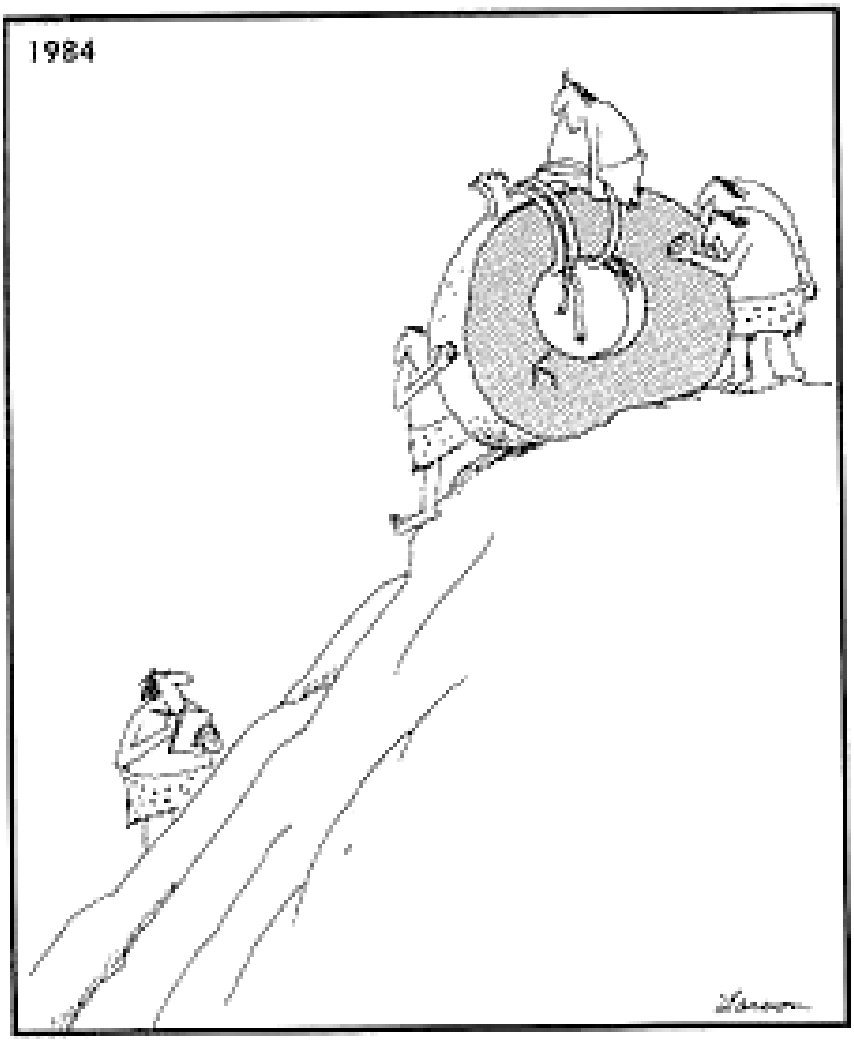


Early experiments in transportation

*Source: The Far Side*

# MEMBERSHIP UPDATES

**New Members:**

**Brooke Cassibo**, Kimley-Horn

**Brandyn Chezick**

**Maddie DeMars**, Kimley-Horn

**Isaac Kramer**, SRF Consulting Group

**Dalia Mikhaeil**

**Benjamin Nault**, SRF Consulting Group

**Clare Seymour**, Kimley-Horn

**Eli Henriksen**, University of St. Thomas

**New Student Members:**

**Devyn Brennan**, George Mason University

**Ben Dubinsky**, Iowa State University

**Fredrick Issifu**, University of North Dakota

**Gabriel Lewis-Mosher**, University of Minnesota

**Member Moves:**

**Kristy Morter**, WSP, formerly Michael Baker International

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*If you or a friend has changed jobs or moved, we would like to stay in touch. Members, please update your information by visiting https://nc-ite.org/Updating_your_Information. To access this area, you will need to know your membership number. Your "username" is your membership number, and your "password" is the first 6 letters of your last name (e.g. Johnson=Johnso). Non-members, please contact Michael Gille via phone (612.294.9733) or email (michael.gille@kimley-horn.com) for assistance. Please provide your name, title, employer, complete street address (including mailstop, if applicable), telephone number, fax number, and email address.*

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