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Cortney Falero
Newsletter Editor

Strategic Modeling for Statewide Greenhouse Gas Reduction

Joe Lehman | MnDOT
Anna Pierce | MnDOT

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

In 2023, the Minnesota Legislature established under Minnesota Statute 174.01 subd. 3 that the commissioner of transportation must set greenhouse gas (GHG) emissions reduction performance targets by Feb. 1, 2025. In order to meet these requirements, Minnesota Department of Transportation (MnDOT) staff identified a need to establish a more accurate baseline, or business as usual (BAU), forecast of transportation GHG emissions through the year 2050.



Jackson St Bike Lane, St Paul, MN. Source: MnDOT

MnDOT reached out to DOTs from Oregon, and Colorado, the Federal Highway Administration (FHWA) and others in order to determine the best model available to estimate GHG emissions and evaluate policies and strategies to reduce GHG emissions and vehicle miles traveled (VMT). We determined this was the VisionEval model, so MnDOT and FHWA coordinated to develop a Minnesota version of the VisionEval model.

VisionEval is an open-source set of models developed by the FHWA and the Volpe Center that are designed to evaluate alternatives for the future based on inputs. Classified as a "what-if" framework by its developers, VisionEval is equipped to run regional- and state-level outputs. The outputs of the model are most often used to compare policies for reductions in VMT or GHG emissions in metric tons of carbon dioxide equivalent (MTCO_{2e}). Strategic in nature, the model is equipped to handle large policy questions but is less effective at modeling smaller nuances, such as parcel-level land use decisions.

(Continued on page 12)

JOB OPENINGS

EXECUTIVE COMMITTEE

President	Nik Costello , Washington County Nik.costello@co.washington.mn.us
Vice President	Joe Devore , KLJ Engineering joseph.devore@kljeng.com
Secretary	Justin Sebens , SRF Consulting Group jsebens@srfconsulting.com
Treasurer	Sarah Peterson , HDR sarah.peterson@hdrinc.com
Directors	Caitlin Anderss , TKDA caitlin.andress@tkda.com
	AJ Fisher , Consor Engineering AJ.Fisher@consoreng.com
Past President	Philip Kulis , SRF Consulting Group pkulis@srfconsulting.com

STANDING COMMITTEES

Young Member Committee	Olivia Polinsky-Rose , HDR Olivia.Polinsky@hdrinc.com
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Advertising	Vacant
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Geometric Design	Amanda Vetter , Apex Engineering Amanda.Vetter@apexenggroup.com
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Membership	Michael Gille , Kimley Horn Michael.Gille@kimley-horn.com
Technology	Vacant

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South Dakota State University	Matthew Croke , President Matthew.Croke@jacks.sdstate.edu
North Dakota State University	Hizb Ullah Sajid , President lhizbullah.sajid@ndsu.edu
University of Minnesota— Duluth	Julie Olson , President dtso@d.umn.edu

GREAT LAKES ITE

Great Lakes ITE District Director	Jeffrey Young , HDR jeffrey.young@hdrinc.com
Great Lakes ITE District NCITE Officer	Morgan Nelson , Kimley Horn Morgan.Nelson@kimley-horn.com

PRESIDENT'S MESSAGE

Greetings NCITE Members!

First, I want to say thank you for the opportunity to serve you as Section President in 2025. On a personal level, NCITE has been extremely important to me as I've grown in my career as a traffic engineer. The technical expertise I've gained through committee involvement, and the relationships that I've built with other industry professionals, have both been invaluable. My goal for the organization this year is to build on our successes from previous years and continue to be a go-to resource for technical information and professional networking. I'd like to thank our outgoing president, Phil Kulis, for his leadership over the past year as we had another great year in 2024. I'd also like to thank our other outgoing board members and committee chairs for all their hard work and efforts in 2024.

As we get into 2025, several technical committees are holding their first meetings of the year or brainstorming meeting topics for the coming year. If you're new to NCITE or just looking for ways to become more involved, attending these technical committee meetings is a great place to start! More information on our committees can be found here: https://nc-ite.org/Committee_Listing.

We are also looking for dedicated volunteers to fill several vacant committee roles. We are seeking a candidate to transition into the Newsletter Coordinator position over the coming year, and several technical committees are also looking for co-chairs including Complete Streets & Safety, Geometric Design, Planning Methods & Applications, and Simulation & Capacity Analysis (SimCap). If you're interested in volunteering to serve the organization in any of these roles, please reach out to me or the respective committee chairs and we can fill you in with more details on what each position entails.

Our 2025 Section Meetings recently kicked off with our January meeting at Jax Café, where we were treated to a presentation from the **City of Chaska** and **Bolton & Menk** on the **Downtown Highway 41 Improvements project in Chaska** – winner of our 2024 Transportation Achievement Award. And for our February meeting, **Khani Sahebjam**, MnDOT Metro District Engineer, provided an excellent **Metro District** update. Both meetings were very well attended, which was great to see! The executive board is actively working on planning several additional events for the coming year, including the following:

- **Section Meetings** – April, May, September, and October
- **Joint Summer Social with MCES, WTS MN, and ITS MN** – St. Paul Saints Game in July
- **Golf Outing** – Our inaugural Golf Outing was a big success last year, and we're looking to continue that success in 2025! Rumor has it that this year's outing may also include mini golf! Tentatively planned for early August.
- **Transportation Symposium with UMN CTS** – October
- **Annual Meeting** – November, Venue TBD

We have a great team serving on the 2025 Executive Board this year! If you have ideas for section meeting topics, ideas to improve the organization, or ways we can better serve our members, please reach out to us!

- Vice President: **Joe DeVore, KLJ**
- Secretary: **Justin Sebens, SRF**
- Treasurer: **Sarah Peterson, HDR**
- Directors: **Caitlin Andress, TKDA** and **AJ Fisher, Consor Engineers**
- GLITE District Representative: **Morgan Nelson, Kimley-Horn**
- Past President: **Phil Kulis, SRF**

Looking forward to a great year ahead!

Nik Costello, 2025 NCITE President



Nik Costello
2025 NCITE President

UPCOMING EVENTS

ite Calendar

ITE Calendar for District, Section, & Chapter Meetings

Stay Connected with NCITE & ITE Events
Online & In Person | Dates Vary



NCITE Calendar

Online & In Person | Dates Vary



GLITE Annual Meeting

Indianapolis, IN | June 8-10, 2025

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

MEET THE 2025 EXECUTIVE BOARD

Nik Costello, 2025 NCITE President

Job Title and Employer: Engineer III, Washington County Public Works Department (currently working as a Project Engineer/CAR in the Metro Transit Gold Line BRT Construction Office)

Past Work: Assistant Traffic Engineer, Washington County Public Works Department

Education: University of Minnesota

Where You Live: St Paul

Family: wife Kelly, daughters Ruth (5) and Nora (2)

Pets: dog Karl

Hometown: Stillwater, MN

Hobbies: Golfing, fishing, camping, skiing, curling, traveling

Interesting Facts:

- My wife and I met in kindergarten, but didn't end up dating till after college.
- I was a varsity cheerleader in high school.
- I've never broken a bone.
- I've attended at least one session of the MN High School State Hockey Tournament for 37 years in a row.
- I once caught a 50lb sturgeon while walleye fishing on the Rainy River.

Favorite TV Show: Twin Peaks (TV show), Rushmore (movie)

Favorite Music: Everybody Wants to Rule the World by Tears for Fears is the greatest song ever recorded

Favorite Restaurant: Sea Salt

Favorite Book: The Hat Trilogy by Jon Klassen

Biggest Accomplishment: Raising my daughters (#GirlDad)

Instruments Played: Alto saxophone back in the day

Best Vacation: Charleston, SC/Savannah, GA

Do you collect anything?: CDs, wool winter clothing

Something on your bucket list: Travel via ship through the Great Lakes



Nik Costello
President

Joe DeVore, 2025 NCITE Vice President

Job Title and Employer: Traffic Supervisor/Project Manager at KLJ Engineering

Education: University of Minnesota Civil Engineering

Where You Live: Lino Lakes, MN

Family: Laura (Wife)

Pets: Coffee (Rabbit)

Hometown: Hugo, MN

Hobbies: Baseball, Softball, Volleyball, Golf, and Snowshoeing if it ever snowed enough.

Interesting Facts:

- I was the bullpen catcher for the University of Minnesota Baseball Team.
- I like to help out with my wife Laura's art fair events (I have no artistic talent myself).
- I have only owned one model of vehicle my whole life. Currently a 2011 Ford Ranger.
- I have worked on corridor studies in every MnDOT district in the past 5 years where I really enjoy getting to see all corners of the state.
- My two favorite places to visit while traveling for work have been Grand Junction, CO and Kalispell, MT

Favorite Podcast: The New York Times Daily

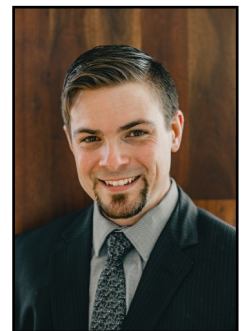
Favorite Music: Indie Rock and anything with a catchy rock tune.

Favorite Food: Proud Member of the Twin Cities (Pizza) Pie Chasers

Favorite Restaurant: Mario's Pizza in St Paul

Desired Superpower: Able to clone myself.

Best Vacation: New England (NYC; Mystic, CT; Newport, RI; Cape Cod, MS; Rockport/Salem, MS; and Boothbay Harbor, ME)



Joe DeVore
Vice President

MEET THE 2025 EXECUTIVE BOARD

Justin Sebens, 2025 NCITE Secretary

Job Title and Employer: Project Manager, SRF Consulting Group

Education: BA (Physics) Carthage College, MS (Civil) UW Madison

Where You Live: Rogers

Family: Wife and 2 Kids (Boy – 9 and Girl – 7)

Pets: One Lab/Pitbull mix

Hometown: Seymour, IL

Hobbies: Golfing, Fishing, Playing with the kids and attending their activities

Interesting Facts:

- I jumped 6' 7" in high jump in High School.
- I have been to Disney World three times (once as a kid, twice as an adult).
- My hometown has less than 200 people in it.

Favorite TV Show: Currently it is Suits

Favorite Music: Country

Favorite Food: Sushi

Favorite Restaurant: Any place there is an NCITE Meeting

Favorite Book: Ready Player One

Favorite Car: Yamaha R-6 Sportbike

Desired Superpower: Ability to be in two places at once (Kids activities are crazy 😊)

Biggest Accomplishment: My family

Best Vacation: Disney World

Do you collect anything? Pokémon cards

Strangest food combination you enjoy: Mayo on hotdogs



Justin Sebens
Secretary

Sarah Peterson, 2025 NCITE Treasurer

Job Title and Employer: Traffic Engineer at HDR

Past Work: Student internships at The City of Fargo and HRI Inc. in PA

Education: Bachelor's in civil engineering from NDSU

Where You Live: Alexandria, MN

Family: Husband, Chad

Pets: Chocolate Lab named Hinckley

Hometown: Fargo, ND

Hobbies: Traveling, board games, paddle boarding/kayaking, Volleyball

Interesting Facts:

- I grew up in a big NDSU household. As a kid, I cheered on the Green Bay Packers because I thought it was NDSU, and it stuck. Go Pack Go!
- I feared dogs growing up, especially big ones, and now I can't imagine life without them, especially Hinckley, my 95lb chocolate lab.
- I believed fish could hear me talk until my early twenties. My husband informed me that is a wives tale parents tell there kids to get them to stop talking while fishing.
- In the summer I enjoy exploring new lakes via paddle board.

Best Vacation: 5 weeks in Germany after high school graduation

What is the strangest food combination you enjoy? Wavy potato chips and ketchup. I don't think it's weird, but my husband sure thinks it is.

What is something on your bucket list? Visit (Stay overnight) all 50 states. 17 left to go



Sarah Peterson
Treasurer

MEET THE 2025 EXECUTIVE BOARD

Caitlin Andress, 2025 NCITE Director

Job Title and Employer: Registered Engineer, TKDA

Past Work: MnDOT District 3, MnDOT District 1

Education: Bachelor of Civil Engineering, University of Minnesota - Twin Cities

Where You Live: Burnsville, MN

Family: My husband (Ben) and children (Lucie, Cam)

Pets: A German Shepherd Dog (Leia) and several freshwater fish named after Paw Patrol characters

Hometown: Ironwood, MI

Hobbies: Reading novels, playing card and board games, exploring breweries

Interesting Facts:

- My hometown averages about 180" of snow each winter, so I grew up sledding, skating, snowmobiling, and cross-country skiing. Winter in the Twin Cities is definitely not the same.
- My current reading obsession is the Epyrean Series. I'm attending the midnight book release for Onyx Storm in late January.
- I graduated from high school when I was 16. My parents wouldn't let me move away to college yet (probably smart), so I attended a community college for two years before transferring to the U.
- My husband and I eloped in Iceland. Easily the most epic vacation of my life.
- I'm collecting cards for a newer trading card game called Altered. My husband and I occasionally play at Fox Den in Burnsville.

Favorite TV Show: How I met Your Mother

Favorite Restaurant: Doolittle's in Eagan

Biggest Accomplishment: As proud as I am of my career accomplishments, nothing beats becoming a mom!

Instruments Played: Flute, piano, and a little bit of saxophone



Caitlin Andress
Director

AJ Fisher, 2025 NCITE Director

Job Title and Employer: ITS & Traffic Engineer, Consor Engineers

Past Work: Skyline Products, Daktronics

Education: Mechanical Engineering from Iowa State University

Where You Live: Saint Paul, MN

Family: My wife and our 2 year old son.

Pets: We have a border collie mix named Piper that we adopted during COVID.

Hometown: Roselle, IL

Hobbies: I enjoy spending as much time outside as I can! I enjoy hiking and biking in the summer, but I'm looking forward to taking the canoe out in the water this year! In the winter, I love to ski.

Interesting Facts:

- I recently moved to Minnesota last summer from Colorado where I lived for 10 years!
- I attended the Minnesota State Fair for the first time last year and it was more than I could have ever imagined.
- I'm an avid baker (when life permits) and enjoy seeking out new bakeries.
- My most recent hobby has been learning a new language and I've been studying French for about 2 years now.
- I'm colorblind which is usually my go-to fun fact when I've run out of other interesting things to say about myself, but it actually makes for some difficult times when working with fiber optic strands and their colors!

Favorite Book: Wooing a Harsh Mistress: Glenwood Canyon's Highway Odyssey by John L. Haley. It's a weird combination of dumb, niche, history, civil engineering, and Colorado.



AJ Fisher
Director

MEET THE 2025 EXECUTIVE BOARD

Morgan Nelson, 2025 Great Lakes ITE District NCITE Officer

Job Title and Employer: Project Manager at Kimley-Horn

Education: Michigan State University, Civil Engineering

Where You Live: Plymouth, MN

Family: Husband Jacob and 1.5 year old daughter

Hometown: Clarkston, MI

Hobbies: I enjoy spending time with family and friends whether that be sharing a meal together, enjoying the lake together or traveling.

Interesting Facts:

- I enjoy baking and recently made a hamburger birthday cake for my brother-in-law.
- I love crockpot Mac & Cheese & last summer made enough to serve 50 people for a backyard party at my house.
- I still have a baby tooth.
- I worked for the ferry on Mackinac Island one summer during college.
- My-coworker now sister-in-law introduced me to my now husband.

Favorite TV Show: Gilmore Girls

Favorite Food: Pizza

Favorite Restaurant: wherever my friends are at

Desired Superpower: Time travel

Biggest Accomplishment: Becoming a mother.

Instruments Played: Recorder in elementary school

Best Vacation: Many, many trips to Mackinac Island, MI

What is the strangest food combination you enjoy? Peanut butter on pancakes and waffles

Do you collect anything? State Quarters

What is something on your bucket list? Travel



Morgan Nelson
GLITE District NCITE
Officer

Phillip Kulis, 2025 NCITE Past President

Job Title and Employer: Director at SRF Consulting Group

Past Work: Transportation Analyst at Kittelson and Associates

Education: MS Penn State University, BS Rochester Institute of Technology (Rochester, NY)

Where You Live: St Louis Park , MN

Hometown: Ithaca, NY

Hobbies: Golfing, biking, hiking, skiing, water sports, smoking (meat), photography, and home improvement projects.

Interesting Facts:

- I completed my first 5k in forever this past year, the Gray Ghost Run in Anoka
- Have lived in four states (New York, Pennsylvania, Arizona, and Minnesota)
- Have made a hole-in-one
- I've never broken a bone

Best Vacation: Anywhere warm in the winter. I'm going to Palm Springs and Vegas this winter.

Favorite TV Show: College football

Favorite Food: Buffalo chicken pizza

Favorite Restaurant: Fletcher's

Desired Superpower: Who doesn't want to be able to fly?

What is the strangest food combination you enjoy?: Apparently ketchup on corn isn't normal. Who knew?



Phil Kulis
Past President

ANNUAL MEETING UPDATE

The Annual Meeting was held on November 15th, 2024 at The Four Seasons Curling Club in Blaine, MN. Congratulations to all the award winners!

Awards

Transportation Professional of the Year Award: **JoNette Kuhnau**

Young Transportation Professional of the Year Award: **Morgan Nelson**

Transportation Achievement Award: **Downtown Highway 41 Improvements, City of Chaska & Bolton & Menk**

Distinguished Member Induction

In recognition of their outstanding contributions to NCITE over the years: **Denny Eyler & Sue Zarling**

Scholarships

Undergraduate Scholarship (\$1,000 each): **Daniel Georgioff & Matthew Croke**

Intern Scholarship (\$1,000 each): **Talha Ahmed & Dylan Moreno**

Robert J Green Undergraduate Scholarship (\$1,000): **Elizabeth Hying**



ANNUAL MEETING UPDATE



We continue to iterate the way we complete these meetings, we welcome your ideas and the opportunity to try out some new things. 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

The Young Member Committee is looking for someone to fill the YMC Co-Chair position this year to assist the talented **Olivia Polinsky-Rose**. This is a two-year position that transitions to YMC Chair the following year. If this position interests you, please contact Olivia Polinsky-Rose Olivia.Polinsky@hdrinc.com.



If you are not receiving the YMC StarChapter emails, please reach out to get on the mailing list.

If you or a co-worker are interested in joining the Young Member Committee please visit the YMC Page on the NCITE Website [here](#).



The modeling framework uses a set of inputs that develop a virtual model of Minnesota’s demographics, land use and transportation characteristics. This established a BAU GHG emissions level for the transportation sector in Minnesota for each of the five-years that MnDOT had to develop GHG emission reduction performance targets for per state statute.

The modeling efforts involve a multi-step process that can take anywhere from 15-minutes to run the model for results to up to 12-hours based on the number of inputs a user adjusts. To support the GHG emissions reduction BAU forecast, MnDOT staff first set up the model framework in RStudio, developing external inputs, creating a geography schema for classifying Minnesota’s development patterns and running and processing the results of the statewide model.

Next, MnDOT staff captured the variation in land use and population characteristics by breaking up the state’s geography in urban, town and rural divisions. These divisions were then aggregated up to the county, metropolitan areas and MnDOT districts to help with policy assessments and the performance target setting process (figure 1). Urban areas are defined as the areas within a metropolitan area’s federal Adjusted Urbanized Area¹. Towns were defined as state aid cities. Areas that did not fit these two classifications were categorized as ‘Rural’ and aligned with Minnesota’s rural Area Transportation Partnership (ATP) boundaries.

The third step was to enter external inputs. These included datasets that reflected employee home and job locations, single occupancy vehicle miles diverted, daily VMT by roadway, transit service, transit fuels, transit powertrains, percentage of mixed-use development land, percentage of developable land, along with others that provided information for demographic, travel and land use characteristics.

Next, MnDOT staff edited internal inputs. These inputs act as proxies for strategies to reduce emissions from transportation. Within VisionEval the internal inputs can be categorized into three primary categories that include fuel and power, land use and travel options. For example, the percentage of registered vehicles that are electric vehicles can act as a proxy for a shift away from petroleum fuel and decarbonization shift to low or no emission vehicles. For the VisionEval BAU forecast model, MnDOT staff used a conservative approach to internal inputs. Continuing with the example of registered electric vehicles, MnDOT staff input a moderate growth of electric vehicle registrations using adoption forecasts from [MnDOT’s Electric Vehicle Infrastructure Needs Assessment](#).

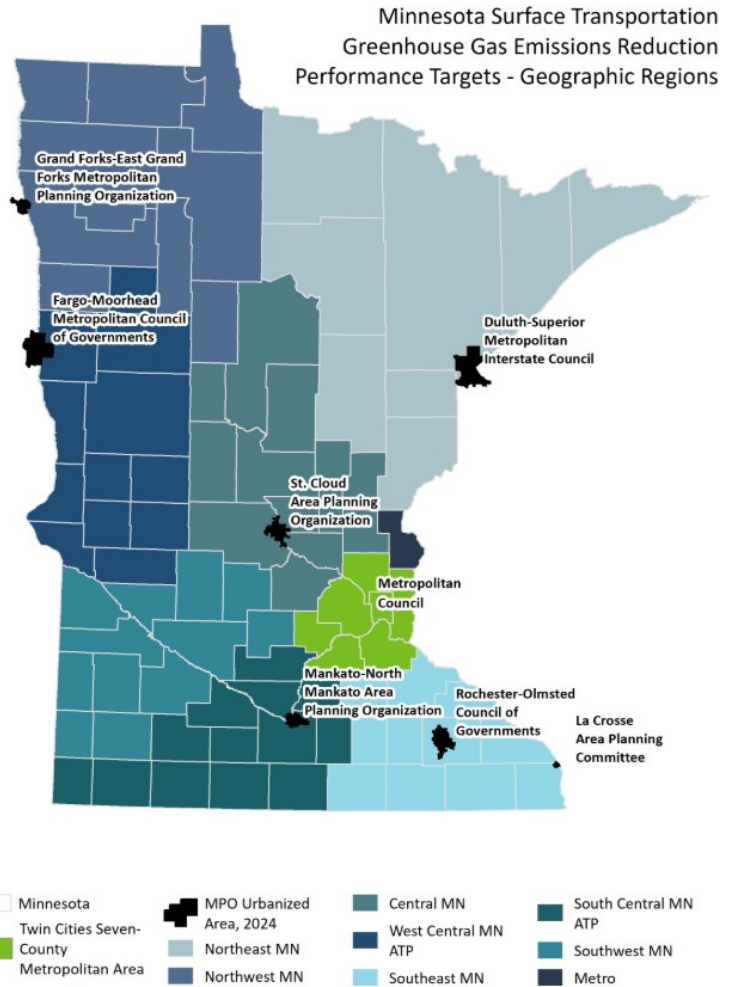


Figure 1: MN Surface Transportation Greenhouse Gas Emissions Reduction Performance Targets – Geographic Regions Map. Source: MnDOT
Click figure to view image in a larger format online.

¹Federally adjusted urbanized areas are defined by the boundary adjustments made by Federal Highway Administration to areas with populations of 50,000 or greater, calculated by and after each Decennial Census.

Once the internal inputs were entered, MnDOT staff ran the model in five-year increments (i.e., 2025, 2030, 2035, 2040, 2045 and 2050) to determine the forecasted transportation sector emissions levels. MnDOT used these output values to understand the existing gap between the forecasted GHG emissions and the statewide Next Generation Energy Act goals (e.g., net zero from 2005 levels by 2050). Figure 2 illustrates the actual measured GHG emissions from Minnesota Pollution Control Agency, the forecasted emissions from the VisionEval BAU model and the Next Generation Energy Act goals as they pertain to the transportation sector GHG emissions.

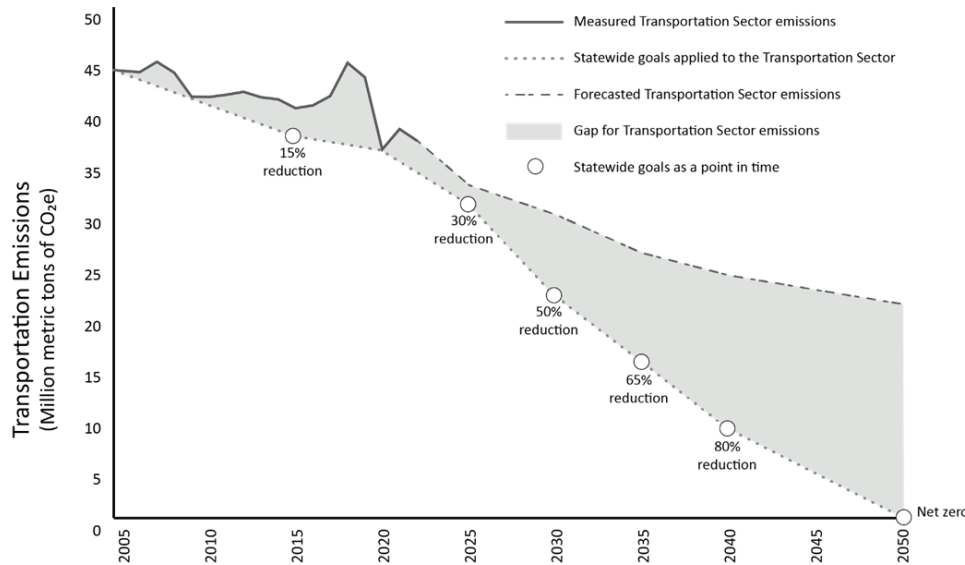


Figure 2: Minnesota Transportation Sector greenhouse gas emissions gap based on measured emissions, emissions goals and forecasted emissions levels, MnDOT 2024. Click figure to view larger chart.

Note: The 'zero' at the right-hand side of the graph represents a net value of zero GHG emissions from the transportation sector. This means that the GHG emissions created by the transportation sector are 100% offset by mitigation efforts.

With this information MnDOT was able to provide a reasonable assumption of the identified gap between the forecasted GHG emissions levels and the Next Generation Energy Act goals. The gap values were used as a base to calculate a per capita annual benchmark for each region using Equation 1 for the surface transportation source emissions, while the gap between the non-surface transportation source emissions is a statewide annual benchmark. The GHG emissions reduction performance targets are then calculated using a cumulative sum of the five preceding, annual GHG emissions reduction benchmarks.

Equation 1. Minnesota Greenhouse gas emissions annual benchmarks, MnDOT 2025.

$$aB_x = G \times \frac{rP}{sP}$$

aB_x = Annual greenhouse gas emissions reduction benchmark
 G = Forecasted Surface Transportation emissions gap² in CO₂e
 sP = Forecasted state population¹
 rP = Forecasted regional population¹

Ultimately, the VisionEval model was first used as a BAU to support the GHG emissions reduction performance target setting process but will continue to be used to assist in understanding impacts that various strategies and policies surrounding fuel and power, land use and travel options have on emissions reductions in Minnesota.

Studying the Effectiveness of Hardened Centerlines on Reducing Bus Passing Behavior in Metro Transit's D line BRT

Olivia Polinsky-Rose, PE | HDR

Hannah DeBruin, EIT | HDR

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

As part of the METRO D Line Bus Rapid Transit (BRT) project, hardened centerlines were installed at three intersections between June and August 2021. A hardened centerline is a section of a roadway centerline made of concrete that is vertically raised, with the intent to discourage drivers from passing stopped buses/traffic in the oncoming traffic lane. Example images of hardened centerlines are provided in Figure 1.



Figure 1: Example images of a hardened centerline on the D Line BRT corridor

Metro Transit and HDR conducted a study to assess the effectiveness of hardened centerlines in preventing bus passing behavior and determine recommendations for future use of this design treatment considering traffic control type, bus stop configuration, AADT, and available curb-to-curb width.

The study included a literature review, field observations, crash data analysis, an interview with Minneapolis Public Works, and a survey of Metro Transit D Line bus operators to understand safety, maintenance, and operational concerns with hardened centerlines. The bulk of analysis in this study used 13-hour video data collected at the five study locations.

Approach

The three study intersections where hardened centerlines were installed include Fremont Avenue N & N 42nd Avenue, Fremont Avenue N & N Dowling Avenue, and Fremont Avenue N & N 35th Avenue. These sites were considered treatment sites. In order to evaluate the effectiveness of hardened centerlines at these sites, they were compared to similar control sites without hardened centerlines on the C Line BRT route. The control sites included N Penn Avenue & N Dowling Avenue and N Penn Avenue & 36th Avenue N.

Control and treatment sites and relevant site characteristics are shown in Figure 2.

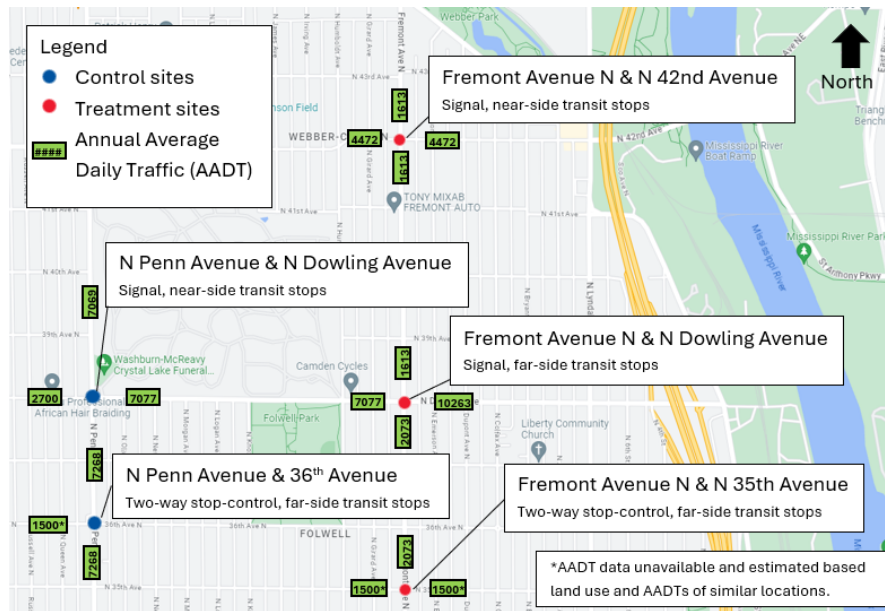
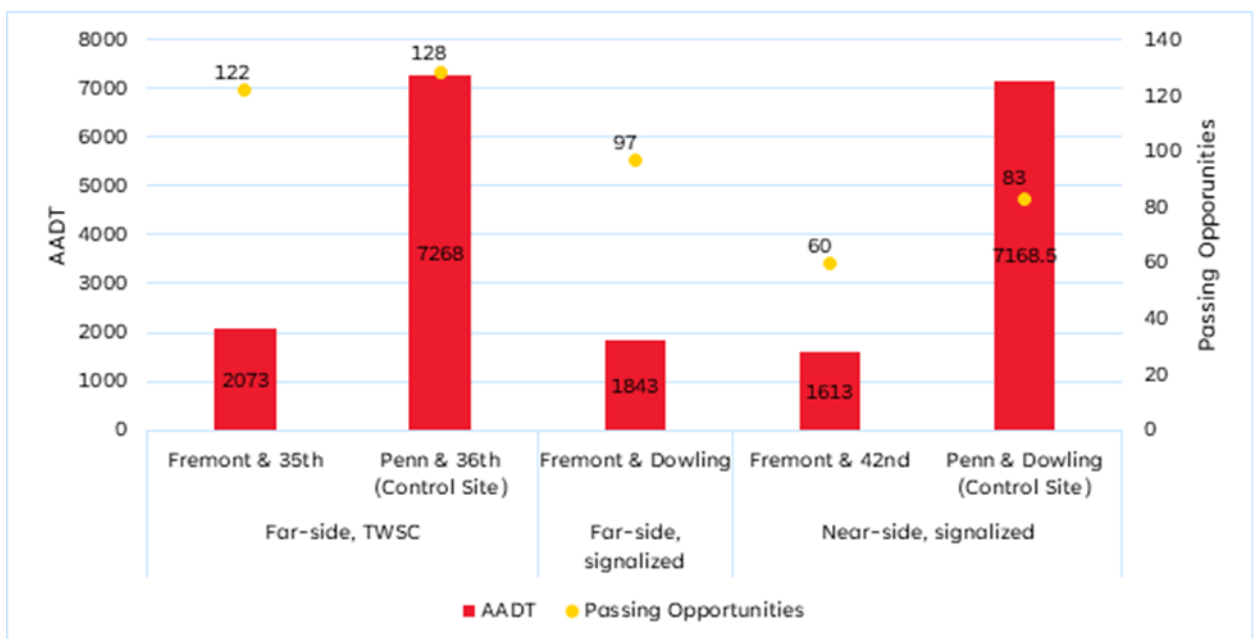


Figure 2: Study Intersections

Bus passing behavior at each site was assessed primarily through 13-hour video data which counted the number of buses arriving and the number of occurrences when a vehicle passed a stopped bus. Additionally, the number of “passing opportunities” were assessed through the video data. “Passing opportunities” were defined as any instance where a bus was stopped for passengers to board and/or alight and a vehicle was stopped behind the bus with an opportunity to pass the stopped bus. Instances where a bus was stopped at a near-side transit stop at a red light to board/alight passengers were not counted as passing opportunity, as the vehicle(s) queued behind the bus could not pass through red light to pass the bus.

In an effort to fairly compare passing behavior across sites, the study attempted to normalize passes at each site to a variety of factors (i.e., daily entering vehicle traffic at that intersection, average daily traffic along the bus-traveled legs, and daily scheduled bus stops at that site). Passes per passing opportunity was ultimately chosen as the rate to account for differences in passing opportunities between two-way stop-controlled intersections,

where the bus was always free to move through the intersection, and signalized intersections, where the bus could be stopped at a red light. These differences are shown in Figure 3.



Key Findings

Passes per passing opportunity were higher at sites with near-side transit stops and at sites with two-way stop-control. Passes per passing opportunity were also higher at control sites than at treatment sites, suggesting hardened centerlines may be an effective treatment for reducing bus passing behavior. To maximize their impact, hardened centerlines may be considered at intersections with design characteristics shown to contribute to higher passing behavior. These design characteristics are summarized below in Table 1. Engineering judgement should always be used to weigh the benefits of hardened centerlines against other considerations.

Table 1: Intersection Characteristics for Hardened Centerline Consideration

Intersection Characteristic	Recommended for Hardened Centerline Consideration	Justification
Intersection Control	Two-way stop-control on minor street	69% of passing occurred at two-way stop-controlled study sites
Location of Bus Stops	Far-side in-lane bus stops	84% of passing occurred at far-side in-lane bus stops
AADT on Bus Stop Legs	>1,499 AADT	All study sites where passing occurred had AADT > 1,499
Available Curb-to-Curb Width on Bus Stop Legs	<32 feet	To account for concerns heard from bus drivers and public works, this recommendation was made assuming a two-way two-lane cross section with 11-foot travel lanes, two-foot outside gutters, one-foot inside gutters, and a 4-foot median

Saint Paul Transportation Safety Action Plan

Ray Hayhurst, AICP | Kimley-Horn
 Helen Schuda, AICP | Kimley-Horn

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

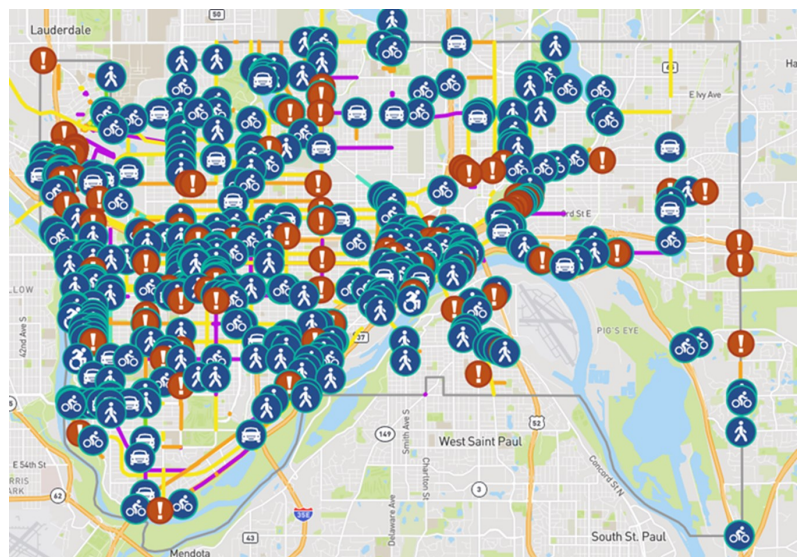
In June 2023, Saint Paul City Council passed a commitment to achieve zero roadway deaths and serious injuries on surface streets by 2045. To guide the City in achieving this goal, Kimley-Horn is assisting the City's Public Works department with preparing a Transportation Safety Action Plan (TSAP). The TSAP is guided by the USDOT Safe System Approach, which emphasizes that the transportation system must be designed in a way to accommodate human error and minimize harm when crashes happen.

The TSAP is part of the Safe Streets and Roads for All program, a federal program that funds the planning and implementation of roadway safety projects in communities across the country. A Transportation Advisory Committee, comprised of City staff, partner agencies, institutional representatives, and community leaders, is overseeing the plan.

The TSAP planning process has included two phases. Phase 1 (Spring 2023 through Spring 2024) included:

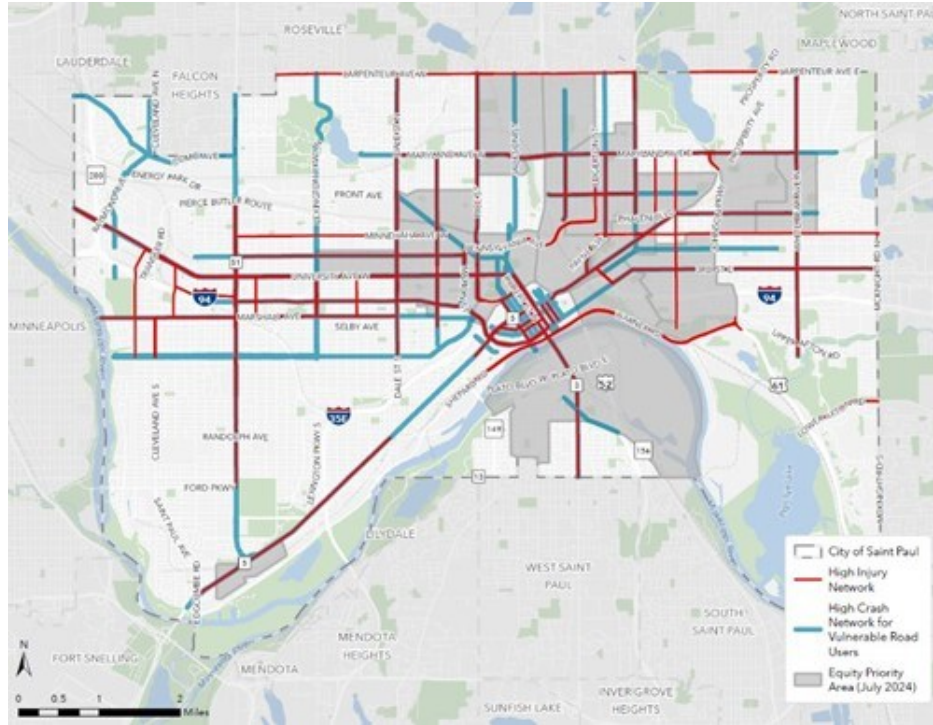
- An analysis and evaluation of all crashes on surface streets in the City from 2018 to 2022
- Previous plan, policy, and national best practices review
- Extensive community engagement, including both citywide online engagement and targeted engagement in disadvantaged communities
- A project prioritization framework to elevate roadway projects that have the greatest safety impact
- Completion of an initial plan that made the City eligible to apply for the Safe Streets for All Implementation Grant

The crash analysis and evaluation focused on identifying corridors where crashes have happened and observing patterns in what is causing them. A primary outcome of the crash analysis was the creation of a High Injury Network (HIN), representing the road segments with the greatest concentration of fatal and serious injury crashes, and a High Crash Network (HCN) for Vulnerable Road Users, representing the road segments with the greatest concentration of crashes involving bicyclists and pedestrians.



Interactive Map Comments

The HIN and HCN are shown in the map below.



High Injury Network, High Crash Network for Vulnerable Road Users, and Equity Priority Area

The City is committed to equitable investment in roadway safety. Equity played several roles in the planning process, including the creation of an equity priority area, defined as census tracts that are both considered disadvantaged by the USDOT (as of July 2024) and contain 50 percent or more people of color. Equity also played a key role in community engagement efforts. The project team noticed that most online engagement participants were from non-disadvantaged areas, so in-person efforts such as pop-ups and direct stakeholder outreach were concentrated in disadvantaged communities to ensure that everyone’s voice was heard. From March to May 2023, the project team collected over 1,200 survey responses and over 800 interactive map comments, had 45 in-person interactions, heard direct feedback from over 20 organizations, and hosted 2 in-person pop-up events at HmongTown Marketplace and Eastern Heights Elementary School.

Kimley-Horn also assisted the City with an application for the Safe Streets for All Implementation Grant, submitted in early 2024. In September 2024, it was announced that Saint Paul won \$15.7 million to implement safety projects in several locations throughout the city.

Phase 2 of the TSAP process is ongoing. Since Spring 2024, Phase 2 has included:

- Analysis of current and potential policies that influence transportation safety in Saint Paul, with comparison to national best practices in transportation safety policy
- Development of a toolbox of proven safety countermeasures for the City to implement as part of its roadway safety projects
- Meetings with partner agencies, including Ramsey County, to strategize about working together and overcoming barriers to improving safety
- Additional community engagement to ensure the draft plan reflects residents’ needs
- Guidelines for implementation, including specific action steps, potential funding sources, and key performance indicators to help track progress toward the City’s goals

Learn more about the plan, view a summary of the crash analysis and engagement efforts, and access the April 2024 Phase 1 plan [here](#).

Leading Pedestrian Intervals: Development of Compatibility Guide

Gina Heim | SRF Consulting
 Nick Erpelding, PE, PTOE | SRF Consulting
 Philip Kulis, PE, PTOE, RSP₂₁ | SRF Consulting

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

Based on recommendations from the State Non-Motorized Transportation Advisory Committee (SNTC), leading pedestrian intervals (LPIs) were identified as a low-cost, feasible solution to improve the safety and experience of pedestrians at signalized intersections. The Minnesota Department of Transportation (MnDOT) teamed with SRF Consulting to determine how and where LPIs can be effectively and reliably implemented on their transportation system.

LPIs are a traffic signal programming setting that results in the Walk indication being displayed prior to the adjacent vehicle phase displaying a green indication (i.e., adjacent parallel through and/or turning traffic is still displayed a red indication). Typically, LPI has a duration of three to seven seconds, which allows pedestrians to establish themselves in the intersection prior to the adjacent movement being given a green indication. This improves pedestrian visibility to drivers and improves safety for pedestrians by increasing the likelihood of motorists yielding to pedestrians.

While the implementation of LPI may seem simple at first glance, care must be taken to ensure the signal operates as intended and does not operate in a way that might result in confusion for pedestrians or drivers.

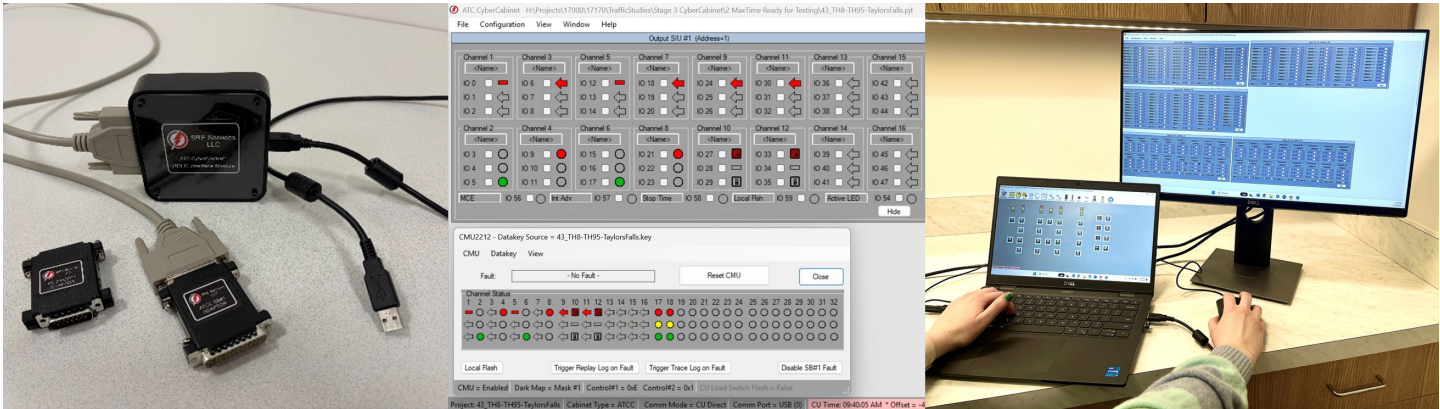
Testing Procedure:

To date, there have been some operations noted between LPIs and specific intersection geometrics or signal controller configurations that have limited the ability to globally implement LPI. This project aimed to identify where and how LPIs can be implemented by better understanding existing constraints, such as geometrics, signal phasing, and signal infrastructure. Specifically, this project investigated these constraints through a five-stage testing procedure, using real signal databases from around Minnesota in the testing process:

1. Theoretical Testing.
2. Virtual Controller Testing (Econolite EOS and Q-Free MAXTIME controllers).
3. CyberCabinet® Testing with Physical Controllers. This device simulates TS-2 and ATC signal cabinets, along with malfunction management units (MMUs) and cabinet monitor units (CMUs). It also allows vehicle, pedestrian, and EVP calls to be placed randomly to simulate a range of traffic conditions.
4. Cabinet Testing at MnDOT's Electrical Services Section (ESS) office.
5. Field Testing at Various Metro Locations.



Ped Walk Symbol Source: Adobe Stock Photos



Stage 4 Testing, Cabinet Testing at MnDOT's ESS Office. Source: SRF

Key Findings:

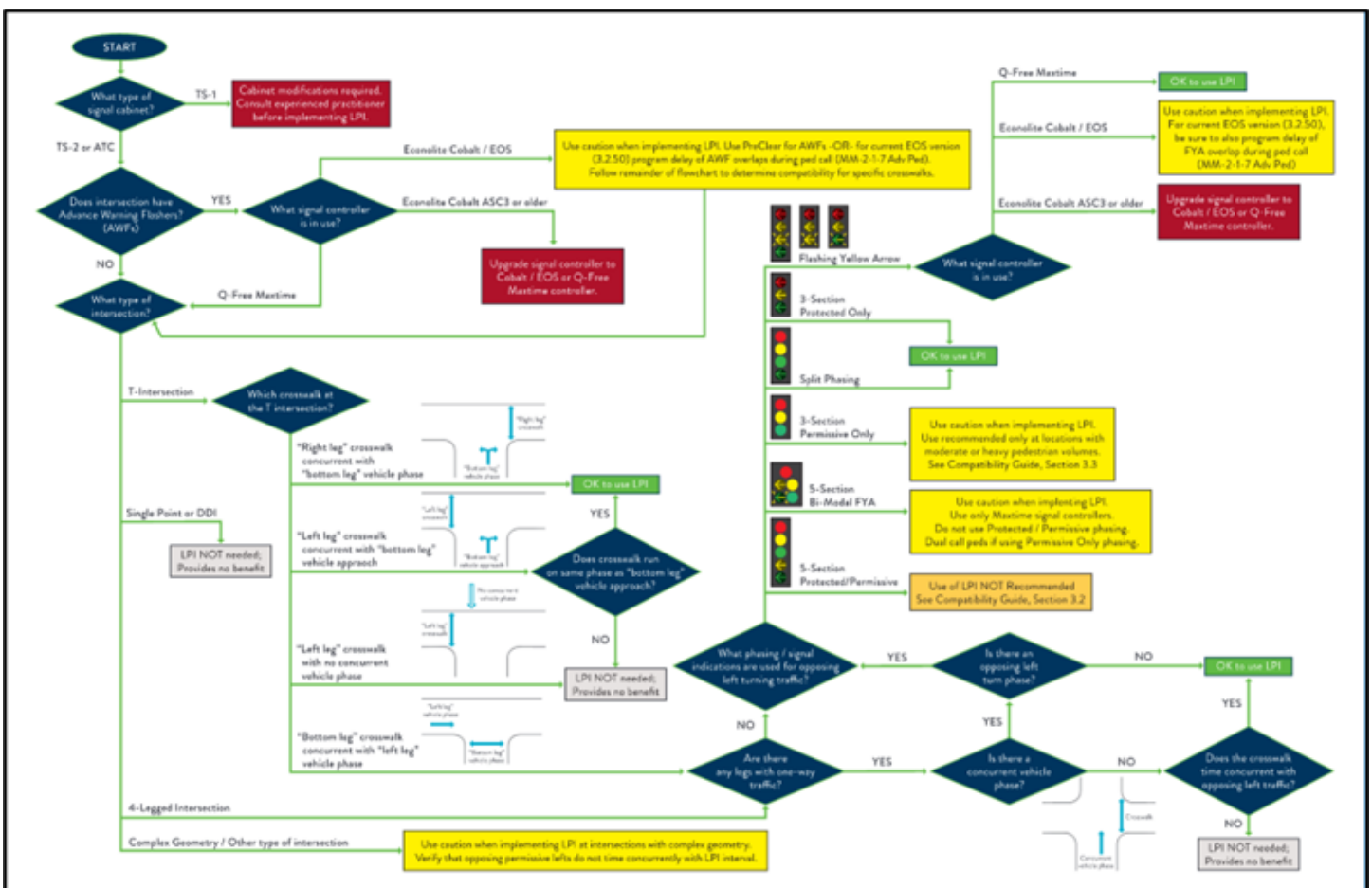
Test databases were pulled from intersections around the Metro District and District 3. The various databases were used to test varying signal and intersection features, such as left-turn phasing, controller types, cabinet types, and emergency vehicle preemption (EVP) setup. Additionally, signal features such as advance warning flashers (AWFs) and Blankout No Right-Turn-On-Red (RTOR) signs were also included in the testing process. Generally, the SRF testing team classified testing scenarios as one of the following:

- Compatible with LPI
- Use caution with LPI
- Not recommended for LPI
- LPI is not needed due to not providing any benefits.

Each scenario was unique to the other, differing in signal or intersection features as described above. The designations given to each testing scenario in each testing stage were used in the development of a Compatibility Guide that can assist with decision-making regarding the implementation of LPIs.

Outcomes:

One of the outcomes of this project is a Compatibility Guide. This Guide is designed to be used as a reference document for signal operators when looking to implement LPI. It includes specific information on signal configurations that are compatible with LPI, along with considerations for implementing LPI at intersections with certain characteristics (e.g., signal phasing, geometry, cabinet type, etc.). This Guide also contains a flowchart that guides signal operators through evaluating each potential location for its compatibility with LPI. The flowchart helps signal operators to identify if a specific approach or intersection would be suited for the implementation of LPI, or if additional efforts would be required to implement LPI. The Compatibility Guide is currently being finalized and will be available in the early spring of 2025 via [MnDOT's Traffic Engineering website](#).



LPI Decision-Making Flowchart: Source: SRF (Click image to view larger format)

TECHNICAL COMMITTEE UPDATE



Geometric Design Technical Committee

Committee Chair: **Amanda Vetter** amanda.vetter@apexenggroup.com

Recent Agenda Items: Traffic Safety Research for Pedestrians, Bikes, & Heavy Trucks at Roundabouts

Future Agenda Items: Roundabouts, innovative intersection solutions, pedestrian considerations

Next Meeting: Joint Meeting with ITC on March 12th from 8-10

More info [here!](#)



Intersection Traffic Control Technical Committee

Co-Chairs: **Tyler Krage** tyler.krage@co.dakota.mn.us **Michael Odell** michael.odell@minneapolis.mn.gov

Recent Agenda Items: City of Madison Presentation

Future Agenda Items:

Next Meeting: Joint Meeting with Geometric Design on March 12th from 8-10

More info [here!](#)



Emerging Technologies in Transportation Technical Committee

Co-Chairs: **Jake Eisinger** jake.eisinger@co.washington.mn.us, **Nathan Wade** nathan@flowlabs.ai

Recent Agenda Items: No Recent Meetings

Future Agenda Items: TBD

Next Meeting: TBD

More info [here!](#)



Complete Streets and Safety Committee

Co-Chairs: **Sarah Peterson** sarah.peterson@hdrinc.com **Sri Durga Yada** SriDurga.Yada@hdrinc.com

Recent Agenda Items: None

Future Agenda Items: Brainstorming of 2025 topics.

Next Meeting: TBD

More info [here!](#)



Planning Methods and Applications Technical Committee

Committee Chair: **Erik Kappelman** EKappelman@srfconsulting.com

Recent Agendas Items: No recent meetings

Future Agendas Items: TBD

Next Meeting:

More info [here!](#)



Traffic Operation and Maintenance Discussion Group

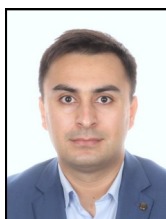
Committee Chair: **Greg Boche** greg.boche@washingtoncountymn.gov

Recent Agenda Items: Street name blades; blade style, post type, etc.

Future Agenda Items: TBD

Next Meeting: March 5th 11:30, location TBD.

More info [here!](#)



Simulation and Capacity Analysis Technical Committee

Committee Chair: **Sajid Raza** sajid.raza@mbakerintl.com

Recent Agenda Items: None

Future Agenda Items: TBD

Next Meeting: TBD

More info [here!](#)



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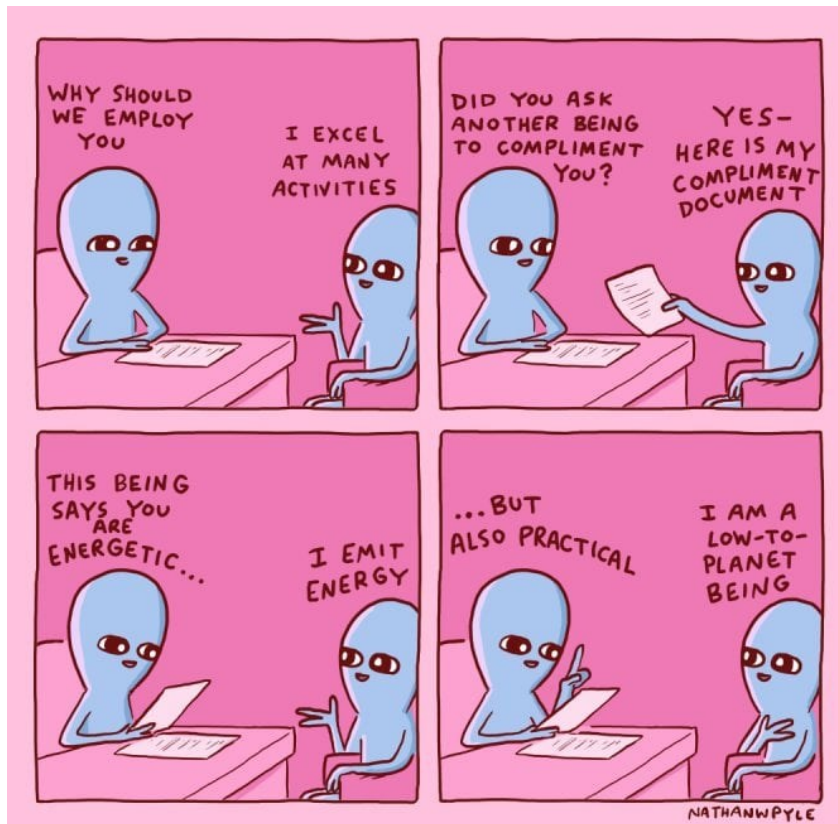

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New Members

Derek Lee, DGR Engineering

Quanzakari DeChiara-Crillion, Hennepin County

Seongjin Choi, University of Minnesota

Thomas Fitzgerald, MnDOT

Rabindra Pariyar, MnDOT

Amanda Kurth, Federal Highway Administration

Dylan Moreno, University of St. Thomas

Swaranjit Roy, University of North Dakota

Moves

Nicklaus Ollrich - MnDOT, formerly Michael Baker International

New 2024 Certifications:

Graham T. Johnson, RSP1

Scott M. Thompson, PTOE

Benjamin M. Brassler, PTOE

Clayton Bayer, PTOE

Justin Anibas, PTOE

Karl Hallstrand, PTOE

Edwin Antonio Jarquin Martinez, PTOE

Venkata Sai Naveen Mallipaddi, RSP1

Nicklaus A. Ollrich, PTOE

Nathan A. Poole, PTOE

Sarah B. Peterson, RSP1

Nathan B. Bausman, PTOE

Erin Daly Davenport, RSP1

Kevin Thomsen, RSP1

Tracey Alan Von Bargaen, RSP2I

Jillian Reiner, RSP1

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