Grand Forks - East Grand Forks

METROPOLITAN PLANNING ORGANIZATION

TECHNICAL ADVISORY COMMITTEE MEETING
WEDNESDAY, FEBRUARY 14TH, 2024 – 1:30 P.M.
EAST GRAND FORKS CITY HALL TRAINING ROOM

PLEASE NOTE: **Due to ongoing public health concerns related to COVID-19 the Grand Forks/East Grand Forks Metropolitan Planning Organization (GF/EGF MPO) is encouraging citizens to provide their comments for public hearing items via e-mail at: info@theforksmpo.org. To ensure your comments are received prior to the meeting, please submit them by 5:00 p.m. one (1) business day prior to the meeting and reference the agenda item(s) your comments address. If you would like to appear via video or audio link for comments or questions, please also provide your e-mail address and contact information to the above e-mail. The comments will be sent to the Technical Advisory Committee members prior to the meeting and will be included in the minutes of the meeting.**

MEMBERS

Palo/Peterson _____	Mason/Schroeder_____	West _____
Ellis _____	Zacher/Johnson _____	Magnuson/Ford ____
Bail/Emery _____	Kuharenko/Hunter _____	Sanders _____
Brooks/Edwardson _____	Bergman _____	Christianson _____
Riesinger _____		

1. CALL TO ORDER

2. CALL OF ROLL

3. DETERMINATION OF A QUORUM

4. MATTER OF APPROVAL OF THE JANUARY 10, 2024, MINUTES OF THE TECHNICAL ADVISORY COMMITTEE

ACTION ITEMS

5. MATTER OF GRAND VALLEY RFP AMENDMENT.. MANSKE

6. MATTER OF MINNESOTA CARBON REDUCTION PROGRAM
    FUNDING SOLICITATION...KOUBA

7. MATTER OF APPROVAL OF 2024-2027 T.I.P. AMENDMENT...................................KOUBA

NON-ACTION ITEMS

8. MATTER OF FUNCTIONAL CLASSIFICATION UPDATE ....KOUBA

9. MATTER OF UND INTERN UPDATE .... HALFORD

10. OTHER BUSINESS
    a. 2024/2025 Unified Work Program Project Update.................................... HALFORD
    b. MPO Updates:
        ➢ March TAC Agenda Items .... HALFORD
            o SS4A Update.. HALFORD
    c. Agency Updates

11. ADJOURNMENT

PROCEEDINGS OF THE
TECHNICAL ADVISORY COMMITTEE
Wednesday, January 10th, 2024

CALL TO ORDER

Stephanie Halford, Chairman, called the January 10th, 2024, meeting of the MPO Technical Advisory Committee to order at 1:31 p.m.

CALL OF ROLL

On a Call of Roll the following member(s) were present: Wayne Zacher, NDDOT-Local Government; Andrea Edwardson, Grand Forks Planning; George Palo, NDDOT-Local District; Nancy Ellis, East Grand Forks Planning; Jon Mason, MnDOT District 2; Steve Emery, East Grand Forks Engineering; Rich Sanders, Polk County Engineer; Dale Bergman, Cities Area Transit; and David Kuharenko, Grand Forks Engineering.

Absent: Brad Bail, Ryan Brooks, Ryan Riesinger, Nick West, Tom Ford, Troy Schroeder, Carter Hunter, Michael Johnson, Lane Magnuson, Nels Christianson, and Jason Peterson.

Guest(s) present: Erika Shepard, MnDOT MPO Coordinator; Josh Peterson, FHWA-MN Division; Siri Simons, MnDOT Office of Sustainability and Public Health; and Blue Webber, Bolton and Menk.

Staff: Stephanie Halford, GF/EGF MPO Executive Director; Teri Kouba, GF/EGF MPO Senior Planner; Tyler Manske, MPO Planner; and Peggy McNelis, GF/EGF MPO Office Manager.

DETERMINATION OF A QUORUM

Halford declared a quorum was present.

INTRODUCTIONS

Halford asked that guests attending the meeting please introduce themselves.

MATTER OF APPROVAL OF THE DECEMBER 13, 2023, MINUTES OF THE TECHNICAL ADVISORY COMMITTEE

MOVED BY ELLIS, SECONDED BY BERGMAN, TO APPROVE THE DECEMBER 13, 2023, MINUTES OF THE TECHNICAL ADVISORY COMMITTEE, AS PRESENTED.

MOTION CARRIED UNANIMOUSLY.

ACTION ITEMS:

MATTER OF APPROVAL OF 2024-2027 T.I.P. AMENDMENTS

Kouba reported that the NDDOT finalized their S.T.I.P., and when comparing it with our T.I.P. we found some differences that we needed to address.

Kouba referred to the staff report and stated that she can go through the changes one by one, but a lot of them are just amendments to the project costs. She said that there are some totally new projects that need to be added as well as some amendments to the project description and/or the scope of work.

Ellis asked if the District or the City had any comments on these changes. Edwardson responded that she will attempt to regurgitate what Al and Dave talked about earlier about having better explanations for some of the T.I.P. Amendments in the staff report of why they are being changed, or why some are being changed by only a small amount, she doesn't know if it was more of a tracking request or something like that, there was a brief conversation about that but since Dave isn't here she thought she would attempt to explain what was discussed.

Kuharenko reported present.

Kuharenko asked if this is something that the MPO decided to do or was it a request from the DOT. Kouba responded that this is something that the MPO has always done. Zacher commented that it depends on, sometimes the small changes, they have been questioned why the S.T.I.P. doesn't match the T.I.P., and cost is, he is guessing, part of it, and he had the same comment when he was looking through it, it wasn't that big of an issue to him but part of it is that they have been questioned in the past; their S.T.I.P. is limited to the number of characters so if you look at the S.T.I.P. the costs are shown in thousands of dollars as opposed as down to the actual cost as shown in the T.I.P. so he is guessing that is part of it. He added that one of the questions he had was that on those earlier sheets it has the supporting information with the lump sum tables, was that in the previous one, because it doesn't appear that it is on the tables that were submitted. Kouba responded that the lump sums were in Amendment #1, and this is Amendment #2, and they were able to add kind of a tracking of when amendments are going to be finalized, so they will finalize this amendment on January 17th at our Executive Policy Board meeting. She added that the reason why you will see that some of them have two dates on them.

Zacher commented that he is fine with that approach, but another thing you could take a look at or consider doing instead of the dates, because, yes it is approved at the local level, but it doesn't necessarily mean that he gets that letter signed off on on that date, so you could put which modification number it is; he is just going to continue one through whatever, he stated calling them adjustments as opposed to amendments, and administrative modifications, so you could put the number in there as well, but he is fine either way, just so you are aware of what he is doing.

Kuharenko said that a question he has, and this is more of process and clarification on his end, so last month we went through all the grant requests, budget requests, how do those requests get

implemented into the T.I.P. He stated that part of the reason he is asking is because of the Washington Street project from 1st to 8th, he knows they had ended up resubmitting that one at a higher dollar amount, so how does that process work, how does everything work to get there between the applications, the T.I.P. and then the S.T.I.P. Zacher responded that it all depends on; so just because you are submitting an application doesn't mean the project is getting accepted; so then they would get the project number set up, so he sees a list of project changes that some through on a weekly basis, and if there are any changes within the MPO/MPA area, he will send the information to Teri, whether it warrants an amendment or not, he does try to identify those areas where an amendment may be needed, but it is just more through the correspondence because again if it is a grant application that is being submitted this year it likely isn't a 2024 project. Kuharenko said it extends out further because you can go out to 2027 on these. Zacher agreed, adding that it is the 2024-2027 T.I.P., and so we can add them later; on those out years it is a little easier because the T.I.P. amendment doesn't need to be done immediately, but if we are working on an amendment we can include it so that it gets in there, so you will see likely see some changes, but it may not need to show up immediately, it may show up in the next T.I.P., it may show up as part of another T.I.P. amendment. Kuharenko said, then, that the fact that our current T.I.P. doesn't necessarily line up with the grant paperwork we submitted is not an issue. Zacher responded that it isn't an issue yet. Kuharenko stated that that was the big thing he wanted to make sure we are covered, because if the S.T.I.P. doesn't match the T.I.P. you can run into issues. Zacher responded that that is correct.

Kuharenk said that the only other comment that he has on this is probably in the background section of the staff report; if you could just throw in a sentence or two, whenever we get these T.I.P. amendments, as to maybe a real brief explanation as to what is causing the changes, it can help bring some clarity as we are reading the staff report, that would probably be the only note he would have. Kouba responded that as she said, this is kind of the, now that the NDDOT has their finalized S.T.I.P. out, that we just kind of go, we have always just kind of gone back to make sure that we are aligned so that Federal Highway isn't going to be asking those questions of why our T.I.P. is not aligned with the S.T.I.P., as well as we do have some totally new projects like the pavement marking, and then some changes to the U.S.2 in East Grand Forks, that scope of work changed. She added that we will always have new ones, of course, coming next month.

Kuharenko asked, with the pavement marking project, is any of that in and around town or is it just in the district. Kouba responded it is in the district. Palo added that it is within the District, but part of it will probably go through the town, but there won't be any cost to the MPO, it is all federal and state funded. He said that the hold-up on that right now, they just got a document changing the width of the striping, so they are trying to go through to see what places they are going to do a change order on and which they are just going to do a continuation of projects to get the new striping in so the numbers are going to be kind of fluid right now. Zacher commented that those numbers changed again today or yesterday; the widths changed based on the new MUTCD.

PROCEEDINGS OF THE
TECHNICAL ADVISORY COMMITTEE
Wednesday, January 10th, 2024

*MOVED BY ELLIS, SECONDED BY PALO, TO APPROVE FORWARDING A
RECOMMENDATION TO THE MPO EXECUTIVE POLICY BOARD THAT THEY
APPROVE THE 2024-2027 T.I.P. AMENDMENTS, AS PRESENTED.*

Voting Aye: **Emery, Palo, Sanders, Ellis, Bergman, Mason, Edwardson, Kuharenko, and
Zacher.**
Voting Nay: *None.*
Abstain: *None.*
Absent: **Peterson, Riesinger, Schroeder, Brooks, West, Ford, Bail, Johnson, Hunter,
Magnuson, and Christianson.**

NON-ACTION ITEMS:

MATTER OF CARBON REDUCTION PROGRAM TOOLKIT PRESENTATION

Halford reported that this is a presentation and non-action item. She said that Sir Simons from
MnDOT is online and will be giving the presentation.

Simons stated that she is the Sustainability Program Supervisor with MnDOT's Office of
Sustainability and Public Health. She referred to a slide presentation and explained that she will
be giving an informational update on the Carbon Reduction Program Toolkit.

Simons said that in terms of what she will cover today, she will talk about the Carbon Reduction
Strategy, which is the new Statewide Plan; the Carbon Reduction Program, which is a relatively
new program; and the Draft Carbon Reduction Toolkit that MnDOT is getting ready to release.
She stated that if you take anything away from her presentation today, the keys are that the
Carbon Reduction Strategy is a new Statewide Plan that was set up to help us better reduce
carbon pollution; Minnesota is continuing to receive funds from the relatively new Carbon
Reduction Program, the funds are available to MPOs for projects; MPOs will be asked to select
projects for FY2025 through FY2026 funding this spring, and then they are preparing resources
in the form of a toolkit to help ensure that the projects that are selected for CRP funds align with
the recently produced carbon reduction strategy.

Simons stated that in terms of the carbon reduction program, just as a refresher this is the
program that was established under the Bipartisan Infrastructure Law for the purpose of reducing
emissions from the transportation sector, specifically from on-road highway sources and the
money can be used first to develop state carbon reduction strategies, which Minnesota and all
other states in the United States have done and recently had to submit by November to meet the
federal deadline for these new plans and then the money can also be used to fund projects
designed to reduce transportation emissions, which they have done and will continue to do in
Minnesota.

Simons said that when it comes to the strategy itself, this includes priorities for reducing carbon emission, and the priorities are identified based on related statewide plans and policies, including the 2022 Statewide Multimodal Transportation Plan, 2022 Climate Action Framework, and the 2019 Pathways To Decarbonization And Transportation Report, so the framework includes categories and then strategies within those categories and project types within those strategies, and these will all guide how MnDOT and Partner Agencies use transportation funds to reduce emission.

Simons stated that going forward, now that we have the plan, any investments from the Carbon Reduction Program should align with the strategy, and while it isn't final yet, because they haven't received federal approval, they are expecting to get federal approval or feedback on their draft in the next month or two, and they will certainly share an update once they receive that feedback.

Simons said that we are now getting into the categories of strategies, the first one is the Electrification category, and in this category, you have three strategies; installing EV charging infrastructure, purchasing or leasing EVs or ZEVs, and supporting education and outreach to promote EVs and ZEVs. She stated that she won't get into the project types that are listed in this category, but an example of a project type would be installing electric vehicle charging stations for light duty vehicles.

Simons said that the next category is Travel Options, there are a number of strategies in this section and they range from installing and maintaining infrastructure for walking, biking and rolling; to planning and designing engineering infrastructure improvements, also for walking, biking and rolling; implementing context of design for travel options; adding high capacity transit options; adding intercity and regional public transit options; and implementing travel demand management. She stated that an example of project type under these strategies would be installing a new sidewalk or completing engineering for a new bike trail.

Simons stated that the third category is Low Carbon Infrastructure and System Management. She said that there are three strategies in this category, which include optimizing transportation system management and operations; utilizing low carbon methods for construction and maintaining transportation infrastructure; and supporting renewable energy generation. She said that project types in these strategy areas include things like signal timing improvement or installing solar panels on the right-of-way.

Siimons commented that in addition to the categories and strategies and project types in the carbon reduction strategies also have project evaluation criteria that can be applied when selecting projects, particularly with the Carbon Reduction Program, so of course when we are talking about the Carbon Reduction Program our key goal is to reduce emissions through transportation projects but our policy goals and public input also point at the importance of other factors when selecting projects for CRP funding, specifically partner agencies noted that the CRP can support objectives in our Statewide Multi-Modal Transportation Plan related to critical connection, healthy, equitable communities, and transportation safety. She stated that when she

says that projects need to align with the CRS, one of the ways that can happen is by evaluating project proposals based on this set of criteria.

Simons stated that the last reminder she wants to share before getting into the Draft Toolkit was just a reminder about how the CRP funds are distributed; Minnesota is receiving about $20.5 million dollars annually from the program and that money is then allocated. She said that 35% of it can be spent anywhere in the State of Minnesota, they elected to distribute that money through the MnDOT Districts; and then some of the funds are allocated directly to MPOs; and the remaining funds can be spent in rural areas, and so they opted, in Minnesota, to distribute those to our Area Transportation Partnerships. She stated that the key takeaway on this slide is that the Carbon Reduction Program projects are not being selected centrally, they are being distributed through our regional partners, and this MPO has money to spend on projects, and she knows that there have already been some discussion about some of the concerns about the small amount of money that is available from this federal program, and ways that the funds can be combined across years to make it more worthwhile to federalize our projects, and we can talk more about that today if people are interested in further discussion later.

Simons commented that, getting into the draft toolkit, they are preparing this as a resource to the different entities that are responsible for selecting projects for Carbon Reduction Program funding, so the idea is that they will share the toolkit, and it will include a template solicitation or application for a carbon reduction program project, then the project selection committee can use that template as is and share it to get your application or they can amend it slightly based on the regional needs, and then applicants will supply their information, submit their proposals, and then the selection committee will be able to review those proposals based on what is provided, with some additional guidance from their toolkit. She stated that really their goal is to make this as easy as possible because it does involve some relatively new technical information about greenhouse gas emission analysis and it is a fairly tight turnaround, they are talking about selecting FY2025 and FY2026 projects in the spring and they know that will take some work but they hope that this toolkit will take a little bit of the burden off of our partners.

Simons stated that she will now share the contents of that draft application. She said that the first part is asking about project readiness, and so the template application will have project proposers to give a brief description of their project, and some of the milestones that have occurred so far, so they can provide whatever level of detail they have available when it comes to describing engineering studies, etc, and this will allow reviewers to determine whether or not projects are eligible and ready to be funded especially when we are talking about FY2025.

Simons said that the second part of the template application is the use of the Carbon Remission Tool. She stated that she thinks this is one of the most valuable parts of the toolkit, so they worked with a consultant to prepare a spreadsheet based tool and applicants can identify the project type that they are proposing, and then navigate to a tab in the spreadsheet and enter a little bit of information and then get the greenhouse gas emissions reduction from their project, as well as the cost effectiveness of the greenhouse gas emissions reduction from their project. She stated that what is nice about this tool is that it leverages state of art methodology for greenhouse gas emissions, it gives results in a consistent format, which she knows has been a

challenge for some areas when they have a number of different projects, certainly during the first round of solicitation, she knows they were instances where there was a really wide range of projects, the were sort of providing their emissions reduction and different units and it was challenging to explore and compare all of that different information so this tool helps to provide something that is very consistent when it comes to utilizing the emissions reduction across a wide variety of projects.

Simons referred to slides that showed examples of how the tool works and went over them briefly.

Simons commented that the last part of the template application involves getting into the co-benefit of the project, so the first question asks about equity and asks for the applicant to describe how the project addresses disparities faced by disadvantaged communities, then the template application offers four different tools the applicant can use to justify their response; and she wants to note here that some feedback they received is that four different tools is a lot but they offer this range of tools because they heard that the climate and economic justice screening tool, which aligns with Justice 40, is somewhat insufficient in capturing all the disadvantaged communities throughout Minnesota, so they would be looking for an applicant just to justify their response based on one of these, but if your MPO feels like this is too many tools you can certainly adapt the template application and reduce the number of tools you are asking people to use, maybe you just want to use one, or maybe you want to allow them to use two, so they are providing that level of possibilities, they aren't intending for it to be used word for word by every single MPO in the MnDOT District.

Simons stated that the second question is about safety, and again asking for a brief narrative, just writing how the project will improve safety, encouraging applicants to provide connection to existing safety studies or plans and then also asking them to comment on whether or not it is in an area with a high crash rate.

Simons said that the third question is about access, so there is a prompt to describe how the project improves non-motorized access and transit or shared mobility access to key locations, as well as if the project improves travel efficiency, and there aren't necessarily resources provided for applicants to help justify their response, it is really up to them to provide a narrative here.

Simons stated that the last question touches on health and so the template application asks applicants to describe how their project improves localized air quality, as well as if is supports active transportation, and they do offer a list of local pollutants as well as the EJScreen Tool for applicants to use to justify their response.

Simons commented that the toolkit includes a scoring rubric that can help selection committees score the narrative that they get in response to the questions, and they are relatively generic rubrics, so it is on a five-point scale, for each narrative the top of the scoring rubric would be a five and so that would be for a project that showed an outstanding connection to the co-benefit by providing documentation, plan narrative, sort of that thorough justification for their response,

and then on the low end they would receive a zero if they can't demonstrate any connection to the co-benefit.

Simons stated that, a brief recap, their toolkit includes the template solicitation; then MPOs, ATPs, MnDOT Districts can use that template to solicit applications; the applicants provide their project readiness summary, that is maybe one to two paragraphs, their cost effectiveness of greenhouse gas emissions reduction using our tool, and then give a brief narrative responses to four co-benefit questions, and then the Selection Committee would score the applications and rank the project based on the cost effectiveness of their greenhouse gas emission, score their co-benefit areas based on that five point rubric, and then get a total score for each of the applications to select their preferred project for funding from the DOT.

Simons commented that in terms of moving this toolkit to finalization, right now they are sharing the draft contents of the toolkit with their stakeholders, and they are asking for feedback so if you have heard anything here that you think isn't going to work for the MPO, in terms of guidance, or if you think there is something missing, she would be really interested in hearing about that today, and then they will incorporate that feedback and share the final toolkit in early February so that our partners can get started with solicitation for, at a minimum FY2025 and FY2026 CRP projects, FY2027 is sort of a bonus year if entities are interested in soliciting for that year. She said that that is their plan for moving from draft to final toolkit, so with that she will pause and see what feedback this group might have, if you have any recommended changes or if you think anything is missing from the toolkit or if you have anything else that you would like to share with her.

Ellis commented that this is a lot of work for the amount of money they receive each year so it would be nice if we could maybe combine funds, like one single application for three or four years rather than trying to figure out how to spend this money every year for $20,000; it is rather difficult so do you have any ideas on that, does MnDOT. Simons responded that she thinks that is a really fair concern, you are completely right, now we are talking about federalizing your project and we are talking about $20,000 to $30,000 dollars; it is challenging. She said that she knows there was some discussion between Jon Mason and representatives from the MPO, she isn't sure who all was involved, but her understanding is that there was a proposal to combine funds from some of the years so the MPO would have $90,000 for FY2025, and Jon is here so she will let him talk about the details of that proposal. Emery stated that he was involved in that discussion as was Stephanie Halford, Jon Mason, and Brian Ketring, with the District, and what we were requesting was, we did have some funds left over from 2023, and then we are using our 2024 allocation for this project, but then we are also requesting that we be able to utilize the 2025 and 2026 allocations, which, as you mentioned would come to about $95,000 in funds. He said that they hope to work through that process because, as Nancy said, with the federal money you have to jump through all the same hoops and loops and everything else that you would if were a million-dollar project, and that is a lot of work for a small amount. He added that, again, as Nancy said, even if a guy could, for future, if you could combine multiple years of allocations into one application that would be better.

Mason stated that what he could help out with would be to set up a follow-up meeting with the same group, and maybe Nancy would like to be a part of it as well, and Siri, and kind of revisit a potential option that involves sort of a trade between the ATP and the MPO, sort of like a payback situation, it does involve the ATP and there are a couple of meetings in February so it would be good if we can all get on the same page with a proposal and then bring that to the ATP and then probably to the MPO process as well, but they have an idea they would like to run by you guys that seems to fit what you are requesting. Ellis commented that it seems to her that it could be done, something similar to like the City Sub-Target dollars, where you combine them and then we know which year we are applying for a four-year project in, if we could do something similar to that, because if we received our City Sub-Target dollars every year, again, to try to find a project to fit that small amount it is just a lot of work so it would be easier if we, as an ATP, figure out a way since we only have one MPO, to combine it into a single T.I.P., like a four year type scenario. Emery said that they would be interested in having another sit-down, having another Teams call or whatever and working out all those details, so if there is something that has to go through the ATP or whatever in February that would be good, at least we are all on the same page, and he thinks that based on their last discussion, as the solicitation for the FY2025 and FY2026 funds is going to come out in February, at least that is his understanding and what they are hoping, and he thinks Stephanie is hoping to have that on the agenda for February.

Simons said that she can say, from her perspective, they are planning to share the draft toolkit in early February so she believes that will fit with the timing with this group.

Mason stated that he will work, sooner than later, to get that call together and get on the same page and talk about logistics, ultimately it is up to the MPO how the funding is used, but this situation does kind of involve using ATP funds and then paying it back over the years, so it is a little bit of a nuance that is involved, multiple years. Emery said that if Jon could reach out to the appropriate parties and try to get something lined up, he would appreciate it. Mason stated that he would do that.

Simons said that she would just like to say that she understands the frustration with small project amounts, her team is also responsible for the delivery of the federal projects with the National Electric Vehicle Infrastructure Program and they have encountered some similar challenges working with really small projects and federalizing them and so she is hopeful that they will get to a solution that feels more manageable than picking a $20,000 project each year; she is looking forward to additional conversations with some of you.

Information only.

OTHER BUSINESS

  a. 2024/2025 Unified Work Program Project Update – Halford stated that the last page is our summary of where we are at with our work program. She pointed out that there are a couple of carry-over items.

Halford stated that we are just buttoning up the Street and Highway Plan, which we gave final approval to last month. She said that the final document is being put together and then we have the signed documents, hopefully we will have the final draft in the next day or two and then we will submit it to our Federal and DOT Partners.

Halford said that the ITS Architecture will be starting this month, so that is at ground zero and we plan to have it completed in the fall.

Halford stated that the Land Use Plan Updates aren't scheduled to begin until 2025 and 2026.

Halford said that we are looking at starting the Micro-Transit study in 2025, but there are a few things that might get moved around so it may be moved up later this year.

Halford stated that unfortunately we didn't receive any proposals for the Grand Valley Study. She explained that the RFP went out but no proposals were submitted by the deadline, nor after it either, so we are going to have some conversations with some key parties on that to see if we want to go forward with it or not.

Halford said that we received three proposals for the Safe Street For All project, so we will be interviewing all three firms. She added that as of now the Selection Committee did receive copies of the documents to do a pre-review and then we will be doing the interviews at the end of January.

Halford stated that we are also currently working on a draft Bikeway Map, which is something we do at the beginning of each year, and once the draft is reviewed and any required changes are made it will go to print.

Kuharenko said he has a question on the Grand Valley Study. He stated that he thinks he saw that there may have been a timing issue with it, could you give us a little bit more detail as to why it wouldn't have received any proposal, was it maybe because the Grand Valley RFP went out at the same time as the Safe Streets For All RFP. Halford responded that there were a couple of firms that reached out, and she reached out to another firm that she thought would apply for the Grand Valley Study to see if she could get some insight as to why they didn't submit a proposal, and what she was told was that a lot of firms were putting all their eggs in the Safe Streets For All project, it was a little bit bigger pot, and they were just kind of concerned about staff availability with going after both studies, that was really just kind of the feedback she got. She said that only really one firm said that if you give it a couple of months they would be interested, but there is no guarantee that that will actually happen, but that is the feedback she got.

Kuharenko stated that he appreciates the information, and he thinks that the only other question or comment that he has is, we've got the Land Use Plan, we are looking at the 2055 MTP, one of the things he probably would like to see is just a schedule of the layout of what we are looking at

for all the different elements of the MTP as we move towards the 2055, with the wrap up of the 2050, so if you could put together a timeline or schedule with all the different pieces that would be great. Halford responded that they will be working on that and added that there will be a couple of pre-conversations we might want to have to discuss maybe approaching the MTP a little bit differently this time around.

      b. February Technical Advisory Committee Agenda Items – Halford reported that she just wants to give a heads up on what we are seeing for our February agenda. She said that we already hit on most of them, such as the carbon solicitation/application, and we already have an idea of the project that the City of East Grand Forks is looking at; we know there will be some T.I.P. amendments; and we will probably be having a discussion on Functional Classification as we got our urban area approved; and there might be some work program amendments in February or March.

      c. Agency Updates – None.

ADJOURNMENT

MOVED BY ELLIS, SECONDED BY KUHARENKO, TO ADJOURN THE JANUARY 10TH, 2024 MEETING OF THE TECHNICAL ADVISORY COMMITTEE AT 2:14 P.M.

MOTION CARRIED UNANIMOUSLY.

Respectfully submitted by,

Peggy McNelis, Office Manager

MPO Staff Report
Technical Advisory Committee: February 14th, 2024
MPO Executive Board: February 21st, 2024

Recommended Action: Matter of approval of the Grand Valley Pedestrian Crossing Study RFP (Request for Proposals) Final Draft

Recommended Action: Approve the Grand Valley Pedestrian Crossing Study RFP, subject to changes, additions, and corrections as discussed.

Background:

This RFP was advertised previously, in November. After discussion with the City of Grand Forks, it has been determined that once again soliciting proposals could prove effective now that some time has passed, and consultants might be more available for the project.

The Metropolitan Planning Organization is seeking proposals from qualified consulting firms to conduct a feasibility study for a pedestrian crossing in the Grand Valley development area. This study aims to enhance long-range planning by evaluating the need for a pedestrian crossing to promote safety and non-motorized transportation options in the vicinity of 62nd Ave S. Study area will be between S Columbia Rd., Belmont Rd., 12th Ave NE (Merrifield Rd.), and a 47th Ave S.

The MPO is seeking a consultant that can not only provide the typical qualifications necessary in the development of the Grand Valley pedestrian crossing Study but also can provide proactiveness, vision, innovation, and collaboration in examining and proposing strategies and recommendations that will ensure a reduction of fatal and serious incidences for the users of all transportation modes.

This project has a not-to-exceed budget of $150,000.

A Steering Committee will also need to be formed. TAC members are encouraged to consider participating in the committee if interested in the Study.

Findings and Analysis:
- RFP was updated. Notable changes include:
  - Updates to the project schedule timeline
  - Addition of P&Z presentation to the project schedule

- o Changed Proposal Evaluation Criteria and Weight to reflect the consulting firms' chosen personnels' individual experience, as opposed to the firms'. This was to ensure that personnel chosen to work on the project had relevant experience.

Support Materials:
- Final Draft Grand Valley Pedestrian Crossing Study RFP

Grand Forks - East Grand Forks

METROPOLITAN
PLANNING ORGANIZATION

Grand Valley Pedestrian Crossing Study
Grand Forks, ND and East Grand Forks, MN

Request for Proposals
for
Transportation Planning Services

February 2024

REQUEST FOR PROPOSALS
FOR
TRANSPORTATION PLANNING SERVICES

The Grand Forks – East Grand Forks Metropolitan Planning Organization (MPO) requests proposals from qualified consultants for the following project:

<u>Grand Valley Pedestrian Crossing Study, City of Grand Forks, North Dakota</u>

Qualifications based selection criteria will be used to analyze technical submittals from responding consultants. Upon completion of technical ranking, the MPO will enter contract negotiations with the top ranked firm. Sealed cost proposals will be required with the RFP. The cost proposal of the top ranked firm will be opened during contract negotiations. The MPO reserves the right to reject any or all submittals. This project has a not to exceed budget of $\underline{150,000}$ dollars.

Interested firms should contact Stephanie Halford, Executive Director, at the MPO, 600 DeMers Avenue, East Grand Forks, MN 56721. Contact can also be done via phone 701-746-2660, or by email: stephanie.halford@theforksmpo.org

All proposals received by March 28th, 2024, at Noon at the MPO Office will be given equal consideration. Minority, women-owned, and disadvantaged business enterprises are encouraged to participate. <u>The full length of each proposal should not exceed fifty (50) pages (twenty-five (25) double-sided pages, if printed) including any supporting material, charts, or tables. Electronic proposals are preferred in doc or pdf format; however, they must be easily reproducible by MPO in black-and-white. If printed copies are sent, only eight (8) should be sent and the MPO will not accept spiral bound proposals; consultants are encouraged to prepare proposals in a format that will ensure for efficient disposal and are encouraged to use materials that are easily recycled. A sealed cost proposal must still be provided in hard copy by the noted due date. Submittals must be received no later than March 28th, at noon (central time). Hard copies of technical and/or cost proposals should be shipped to ensure timely delivery to:</u>

Stephanie Halford
Executive Director
Grand Forks – East Grand Forks MPO
600 DeMers Ave.
East Grand Forks, Minnesota 56721
stephanie.halford@theforksmpo.org
Phone: 701-746-2660
Cell: 701-610-6582

Once submitted, the quotes become the property of MPO.

Table of Contents

Appendix A   Attachments 1 & 2

Appendix B   Cost Proposal

I.   Purpose of Request

The MPO requests proposals from qualified consultants for the following project:

<u>Grand Valley Pedestrian Crossing Study City of Grand Forks, North Dakota</u>

The purpose of this Request for Proposals (RFP) is to provide an interested consulting firm with enough information about the professional services desired by the MPO.

A selection committee will rank submittals from responding consultants. Upon completion of the rankings, the MPO will enter into contract negotiations with the top ranked firm. Sealed cost proposals will be required with the RFP. The cost proposals of the top-ranked firm will be opened during contract negotiations. The MPO reserves the right to reject any and all submittals.

II.   General Instructions

Any questions or comments regarding this proposal should be submitted to:

> **Stephanie Halford**
> **Executive Director**
> **GF/EGF MPO**
> **600 DeMers Ave**
> **East Grand Forks, MN 56721**
>
> **Office Phone: 701-746-2660**
> **Direct Phone: 218-399-3370**
> **Email: Stephanie.Halford@theforksmpo.org**

A.   Proposals shall be submitted to:

> **GF/EGF MPO**
> **600 DeMers Ave**
> **East Grand Forks, MN 56721**

B.   All proposals must be clearly identified and marked as follows:

> **Proposal for:**
> **Grand Valley Pedestrian Underpass Study, City of Grand Forks, North Dakota**
> **Firm's Name**
> **GF/EGF MPO**

<mark>All proposals must be received by noon (central time) March 28th, 2024,</mark> at which time the

proposals will be opened for review. Cost proposals will remain sealed in a secure place until proposal ranking is complete and contract negotiations begin. An electronic copy or eight (8) copies of the technical proposal must be provided. One copy of the cost proposal shall be submitted in a separate, sealed, and clearly marked envelope.

C.   Selection Committee

The technical proposals will be reviewed by the Selection Committee, which may include staff from local municipalities and multi-jurisdictional bodies as follows:
- City of Grand Forks Planning Department
- City Of Grand Forks Engineering Department
- Grand Forks Public Schools
- Grand Forks County
- MPO
- NDDOT District

Once the written proposals are received, if there are five or more proposals the Selection Committee will rank the proposals to interview the top three (3). A 40-minute interview will be scheduled for April 23rd – 25th, 2024, with the firms that submit the top three ranked proposals, if four proposals are received then all will get an interview. This 40-minute interview will provide an opportunity for the selection committee members to ask questions of the submitting firms and get clarification on any information in the proposals that may not be clear. Firms chosen for interviews will be expected to make presentations and should prepare one. The interviews may be conducted via online service. Firms may be asked to verbally expand upon points in their written proposal and should be prepared to do so.

D.   Respondent Qualifications

Respondents must submit evidence that they have relevant experience and have previously delivered services similar to the ones required. Each respondent may also be required to show that he/she has satisfactorily performed similar work in the past and that no claims of any kind are pending against such work. No proposal will be accepted from a respondent who is engaged in any work that would impair his/her ability to perform or finance this work.

No proposal will be accepted from, nor will a subcontract be awarded to, any respondent who is in arrears to MPO or its representative governments, upon any debt or contact; who is in default, as surety or otherwise, upon any obligation to the local partners; or who is deemed to be irresponsible or unreliable by the local representatives.

E.   Disadvantaged Business Enterprise

In the performance of this agreement, the contractor shall cooperate with MPO in meeting its goals with regard to the maximum utilization of disadvantaged business enterprises and will use its best efforts to ensure that such business enterprises shall have maximum practical opportunities to compete for subcontract work under this agreement.

1. Policy

   It is the policy of the Department of Transportation that disadvantaged business enterprises as defined in 49 CFR Part 23, shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with federal funds under this Agreement. Consequently, the DBE requirements of 49 CFR Part 23 applies to this Agreement.

2. DBE Obligation

   The MPO and contractor agree to ensure that disadvantaged business enterprises as defined in 49 CFR Part 23 have the maximum opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with federal funds provided under or pursuant to this Agreement. In this regard, the contractor shall take all necessary and responsible steps in accordance with 49 CFR Part 23 to ensure that disadvantaged business enterprises have maximum opportunity to compete for and perform contracts. The contractor shall not discriminate based on race, creed, color, national origin, age, or sex in the award and performance of DOT-assisted contracts.

F.   Equal Employment Opportunity

In connection with this proposal and any subsequent contract, the consultant shall not discriminate against any employee or applicant for employment because of race, color, creed, religion, national origin, disability, sex, or status regarding public assistance. The consultant will take action to ensure that its employees are fairly treated during employment without regard to their race, color, creed, religion, national origin, disability, sex, or status regarding public assistance. Such actions shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising, layoff, or termination; rate of pay or other forms of compensation; and selection for training, including internship and/or apprenticeship. The consultant further agrees to insert a similar provision in all subcontracts, except subcontracts for standard commercial supplies or raw materials. The consultant will furnish all necessary information and reports and will permit access to its books, records, and accounts by the MPO and/or its representatives including state and federal agencies, for purposes of investigation to ascertain compliance with non-discrimination provisions or any resultant contract.

G.   Ownership, Publication, Reproduction, and Use of Materials

All work products of the contractor which result from this contract are the exclusive property of MPO, local partners, and its federal/state grantor agencies. No material produced in whole or part under this agreement shall, during the life of this agreement, be subject to copyright in the United States or in any other country. Permission and approval must be obtained from the MPO before any report, handbook, cassettes, manual, interim data, or results are published. Draft copies of all deliverables must be prepared by the consultant and reviewed and approved by the MPO before publication. The consultant, subject to the approval by the MPO, shall have the authority to publish, disclose, distribute,

and otherwise use in whole and part, any reports, data, or other materials prepared under this agreement.

H.   Records, Access, and Audits

The consultant shall maintain complete and accurate records with respect to allowable costs incurred and manpower expended under this contract. All such records shall be maintained on a generally accepted accounting basis and shall be clearly identified and readily accessible. The consultant shall provide free access to the representatives of MPO, the US Department of Transportation, and the Comptroller General of the United States at all proper times to such data and records, and their right to inspect and audit all data and records of the Consultant relating to his performance under the contract; and to make transcripts there from as necessary to allow inspection of all work data, documents, proceedings, and activities related to this contract for a period of three (3) years from the date of the final payment under this contract.

I.   Conflicts of Interest

No official or employee of the MPO, state, or any other governmental instrumentality who is authorized in his official capacity to negotiate, accept, or approve, or to take part in negotiating, accepting, or approving any contract or subcontract in connection with a project shall have, directly or indirectly, any financial or other personal interest in any such contract or subcontract. No engineer, attorney, appraiser, inspector, or other person performing services for the MPO, state, or a governmental instrumentality in connection with a project shall have, directly or indirectly, a financial or other personal interest other than his employment or retention by the MPO, state, or other governmental instrumentality, in any contract or subcontract in connection with such project. No officer or employee of such person retained by the MPO, state, or other governmental instrumentality shall have, directly or indirectly, any financial or other personal interest in a project unless such interest is openly disclosed upon the public records of the MPO, the NDDOT, the MnDOT, or such other governmental instrumentality, and such officer, employee, or person has not participated in such acquisition for and in behalf of the state.

J.   Eligibility of Proposer, Non-procurement, Debarment and Suspension Certificate, and Restriction on Lobbying

The consultant is advised that his or her signature on this contract certifies that the company/agency will comply with all provisions of this agreement, as well as applicable federal and state laws, regulations, and procedures. Moreover, the consultant affirms its compliance with the federal Debarment and Suspension Certification and the Federal Restrictions on Lobbying.

K.   Subcontracting

The contractor may, with prior approval from the MPO, subcontract as necessary to accomplish the contract objectives. Subcontracts shall contain all applicable provisions of this agreement, and copies of the subcontract must be filed with the MPO.

L.   Assignments

The contractor shall not assign or transfer the contractor's interest in this agreement without the express written consent of the MPO.

M.   Procurement- Property Management

The contractor shall adhere to 49 CFR 18.36 when procuring services, supplies, or equipment, and to the applicable provisions of 49 CFR 18.32 and FHWA Safety Grant Management Manual, Transmittal 14, October 5, 1995, Property Management Standards, which are incorporated into this agreement by reference, and are available from the North Dakota Department of Transportation.

N.   Termination

The right is reserved by either party to terminate this agreement with or without cause at any time if the recipient does not comply with the provisions of this agreement or its attachments.

If the MPO terminates this agreement, it reserves the right to take such action as it deems necessary and appropriate to protect the interests of the MPO, and its state/federal grantor agencies. Such action may include refusing to make any additional reimbursements of funds and requiring the return of all or part of any funds that have already been disbursed.

O.   Amendments

The terms of this agreement shall not be waived, altered, modified, supplemented, or amended in any manner whatsoever, except by written instrument signed by the parties.

P.   Civil Rights

The contractor will comply with all the requirements imposed by Title VI of the Civil Rights Act of 1964 (78 STAT. 252), the regulation of the Federal Department of Transportation, 49 CFR, Part 21, and Executive Order 11246.

The contractor shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, handicap, or national origin. The contractor shall take affirmative action to ensure that applicants are employed and that employees are treated during their employment without regard to their race, religion, color, sex, age, handicap, or national origin. Such actions shall include but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or advertising, layoff or termination, rates of pay, or other forms of compensation, and selection for training, including apprenticeship. Furthermore, the contractor agrees to insert a similar provision in all subcontracts, except subcontracts for standard commercial supplies or raw materials.

Q.   Civil Rights- Noncompliance

If the contractor fails to comply with the federal or state civil rights requirements of this

contract, sanctions may be imposed by the FHWA or the NDDOT as may be appropriate, including, but not limited to:

1. Withholding of payments to the contractor under the contract until the contractor complies, or
2. Cancellation, termination, or suspension of the contract, in whole or in part.

R. Energy Efficiency

The contractor shall comply with the standards and policies relating to energy efficiency which are contained in the North Dakota Energy Conservation Plan issues in compliance with the Energy Policy & Conservation Act, Public Law 94-163, and Executive Order 11912.

S. Disabled

The contractor shall ensure that no qualified disabled individual, as defined in 29 USC 706(7) and 49 CFR Part 27 shall, solely by reason of this disability, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity that receives or benefits from the assistance under this agreement.

T. EPA Clean Act and Clean Water Acts

The contractor shall comply with the Clean Air Act, 42 U.S.C. 1857; the Clean Water Act, 33 U.S.C. 1251; EPA regulations under 40 CFR Part 15, which prohibits the use of nonexempt federal contracts, grants, or loans of facilities included on the EPA List of Violating Facilities, and Executive Order 11738.

U. Successors in Interest

The provisions of this agreement shall be binding upon and shall ensure to the benefit of the parties hereby, and their respective successors and assigns.

V. Waivers

The failure of the MPO or its local state/federal grantors to enforce any provisions of this contract shall not constitute a waiver by the MPO or its state/federal grantors of that or any other provision.

W. Notice

All notices, certificates, or other communications shall be sufficiently given when delivered or mailed, postage prepaid, to the parties at their respective places of business as set forth below or at a place designated hereafter in writing by the parties.

X. Hold Harmless

The contractor shall save and hold harmless the MPO, its officer, agents, employees, and

members, and the State of North Dakota and Minnesota and the NDDOT and MnDOT, its officers, agents, employees, and members from all claims, suits, or actions of whatsoever nature resulting from or arising out of the activities of the contractor or its subcontractors, agents, or employees under this agreement. It is hereby understood and agreed that any and all employees of the contractor and all other persons employed by the contractor in the performance of any of the services required or provided for under this agreement shall not be considered employees of the MPO, the NDDOT, or the MnDOT and that any and all claims that may arise under the Worker's Compensation Act on behalf of said employees while so engaged and any and all claims by any third parties as a consequence of any act or omission on the part of said contractor's employees while so engaged in any of the services to be rendered under this agreement by the contractor shall in no way be the obligation or responsibility of the MPO.

Y.   Compliance with Federal Regulations

The contractor is advised that his or her signature on this contract certifies that its firm will comply with all provisions of this agreement as well as applicable federal and state laws, regulations, and procedures. Moreover, the contractor affirms its compliance with the federal Debarment and Suspension Certification and the federal Restrictions on Lobbying.

III.   Preliminary Project Schedule

A.   Consultant Selection

Advertise RFP to Qualified Firms	February 21 – March 28, 2024
Receive Proposals	Noon on March 28, 2024
Review Proposals	April 1-11, 2024
Select Interview Finalists & Notify	April 12, 2024
Interview the Finalists	April 23 – April 25, 2024
Notify the Finalist	April 26, 2024
Contract Negotiations Completed	April 29 – May 9, 2024
MPO Technical Advisory Committee Approval	May 8, 2024
MPO Executive Board Approval	May 15, 2024

B.   Project Development

Notice to Proceed	June 14, 2024
Full draft preliminary	Noon on September 6, 2024
Full final draft	Noon on October 4, 2024
Presentation of Final Draft to Grand Forks P&Z	October TBD, 2024
Presentation of Final Draft to GF City Council	October TBD, 2024
Presentation of Final Draft to TAC	October 9, 2024
Presentation of Final Draft to Executive Board	October 16, 2024
Anticipated Project Completion	November 22, 2024

IV.   RFP Evaluation Criteria & Process

The Committee will determine which firm would best provide the services requested by the RFP. When choosing a consulting firm, the MPO will have a two (2) step process. The proposal evaluation will evaluate the proposal that the firm sends the MPO. The evaluation will reduce the number of firms to three (3) for the purposes of interviewing. The interview evaluation will be based on the interview with the firm. The MPO in close coordination with members of the Selection Committee will evaluate the proposals based on, but not limited to, the following criteria and their weights:

A.   Proposal Evaluation Criteria and Weight

   1.   Demonstrates understanding of the scope of work and local factors. Shows how firm proposes to approach, resolve challenges, and encourage new ideas that improve the end project. (Weight 25%)

   2.   Demonstrates the firm's designated team members' knowledge and experience to successfully address the scope of work. (Weight 25%)

   3.   Demonstrates the firm's designated team members' history of timely performance, quality, and integrity, as evidenced by a list of client references. Demonstrates the firm's approach to managing resources and project output. (Weight 15%)

   4.   Demonstrate experience, expertise, qualifications, and credentials of project manager, key personnel, and subconsultant team members. Project team should indicate other significant projects being worked on, the percent of involvement, and probable completion date of the individual's work on the project. (Weight 25%)

   5.   Provide a time schedule for completion of each task and the entire project, with appropriate time for review. Demonstrate the project team has the resources necessary to complete the project. (Weight 10%)

B.   Interview Evaluation Criteria and Weight

   1.   Observations on existing conditions and key project information. (Weight 20%)

   2.   Identification of key issues or problems that will need to be considered and any initial thoughts on how to resolve issues or problems. (Weight 25%)

   3.   Innovative approaches and concepts. (Weight 25%)

   4.   Experience and capabilities in development of similar studies of both key personnel and the project team. (Weight 20%)

   5.   Quality of interview. Comment on specific reasons why the firm should be selected for the project. (Weight 10%)

Each proposal will be evaluated on the above criteria by the Selection Committee. The interview and proposal scores will be combined to have a final score. The firm with the best final score will be contacted for contract negotiations. The qualifying firm chosen by the Selection Committee will enter a contract and fee negotiation based on the sealed cost proposal, submitted in a separate envelope.

The MPO is an Equal Opportunity Employer.

V. Terms and Conditions

A.   The MPO reserves the right to reject any or all quotes, or to award the contract to the next most qualified firm if the successful firm does not execute a contract within forty-five (45) days after the award of the proposal.

B.   The MPO reserves the right to request clarification of information submitted and to request additional information about one or more applicants.

C.   Any proposal may be withdrawn up until the date and time set for the opening of the proposals. Any proposals not so withdrawn shall constitute an irrevocable offer, for a period of 90 days (about 3 months), to provide to the MPO the services set forth in the attached specifications, or until one or more of the quotes have been approved by the MPO Policy Board.

D.   If, through any cause, the firm shall fail to fulfill in timely and proper manner the obligations agreed to, the MPO shall have the right to terminate its contract by specifying the date of termination in a written notice to the firm at least ninety (90) working days before the termination date. In this event, the firm shall be entitled to just and equitable compensation for any satisfactory work completed.

E.   Any agreement or contract resulting from the acceptance of a proposal shall be on forms either supplied by or approved by the MPO and shall contain, as a minimum, applicable provisions of the Request for Qualifications. The MPO reserves the right to reject any agreement that does not conform to the Request for Qualification and any MPO requirements for agreements and contracts.

F.   The firm shall not assign any interest in the contract and shall not transfer any interest in the same without prior written consent of the MPO.

VI. Proposal Format and Content

Proposals shall include the following sections at a minimum:
1. Introduction and Executive Summary
2. Response to Administration Questions
3. Summary of Proposed Technical Process/Planning Process
4. Description of Similar Projects within the last 5 years and key staff assigned to them.
5. Project Staff Information including breakdown of estimated staff hours by each staff class per task.
6. References
7. DBE/MBE Participation
8. Sealed Cost Proposals (in a separate envelope)

Detailed requirements and directions for preparation of each section are outlined below.

A.   Introduction and Executive Summary

Provide the following information concerning your firm:
1.   Firm name and business address, including telephone number and email address.
2.   Year established (including former firm names and year established, if applicable).
3.   Type of ownership and parent company, if any.
4.   Project manager's name, mailing address, and telephone number, if different from item 1. Project manager's experience.

In the Executive Summary, highlight the major facts and features of the proposal, including any conclusions, assumptions, and recommendations you desire to make.

B.   Administrative Questions

Provide the following information concerning your firm:
1.   Identify the respondent's authorized negotiator.
Give the name, title, address, and telephone number of the respondent's authorized negotiator. The person cited shall be empowered to make binding commitments for the respondent firm.
2.   Provide workload and manpower summaries to define respondent's ability to meet project timeline.

C.   Summary of Proposed Technical Process

Discuss and clearly explain the methodology that your firm proposes to use to satisfactorily achieve the required services on this project. The respondent must document his/her clear understanding of the RFPs entire scope of work and project intent (see VII of RFP) for the Grand Valley Pedestrian Crossing Study, data requirements, public participation process, and alternative evaluation methodology. Include all aspects of technical analysis, projections, advanced technology and software, and public participation processes. Address any unique situations that may affect the timely, satisfactory completion of this project.

D.   Project Staff Information

Provide a complete project staff description in the form of a graphic organization chart, a staff summary that addresses individual roles and responsibilities, and resumes for all project participants. Please provide staff information breakdown of estimated staff hours by each staff class per task.   It is critical that contractors commit to levels of individual staff members' time to be applied to work on this project. Variance from these commitments must be requested in writing from the MPO and reviewed/approved in terms of project schedule impact.

The completion of the scope of work in this agreement by the contractor must be done without any adverse effect in any way on other contracts that the contractor currently has in place with the MPO.

E.   Similar Project Experience

Describe similar types of studies/construction projects completed or currently under contract.

F.   References

Provide References of three clients for whom similar work has been completed.

G.   DBE/MBE Participation

Present the consultant's efforts to involve DBE/MBE businesses in this project. If the consultant is a DBE/MBE, a statement indicating that the business is certified by the NDDOT or MNDOT as a DBE/MBE shall be included in the proposal. If the consultant intends to utilize a DBE/MBE to complete a portion of this work, a statement of the subcontractor's certification by either the NDDOT or Mn/DOT shall be included. The percentage of the total proposed cost to be completed by the DBE shall be shown.

H.   Cost Quotes/Negotiations

1.   Cost Quotes

Submit in a separate sealed envelope a cost proposal for the project work activities. Cost proposals will be separated from technical proposals and secured unopened until the technical evaluation process is completed. Cost Proposals shall be based on hourly "not to exceed" amount. Cost proposals must be prepared using the format provided in Appendix B. Attached to the Cost Proposal the Certification of Indirect Rate Form also provided in Appendix B should be filled out.

2.   Contract Negotiations

The MPO will negotiate a price for the project after the Selection Committee completes its final ranking of the consultants. Negotiation will begin with the most qualified consultant, based on the opening of their sealed cost proposal. If the MPO is unable to negotiate a fair and reasonable contract for services with the highest-ranking firm, negotiations will be formally terminated, and will begin with the next most qualified firm. This process will continue until a satisfactory contract has been negotiated.

The MPO reserves the right to reject any, or all, submittals.

VII. Background and Scope of Work

A.   Background

The MPO is seeking proposals from qualified consulting firms to conduct a feasibility study for a pedestrian crossing in the Grand Valley development area. This study aims to enhance long-range planning by evaluating the need for a pedestrian crossing to promote safety and non-motorized transportation options in the vicinity of 62nd Ave S. The study area will be between S Columbia Rd., Belmont Rd., 12th Ave NE (Merrifield Rd.), and 47th Ave S.

Additional Considerations:

The Grand Forks School District owns a parcel on Cherry St north of 62nd Ave S
S Washington St is anticipated to be widened to five lanes wide.

62nd Ave S is anticipated to be reconstructed and widened to a three-lane roadway within the next 10-15 years.

S Columbia Rd is anticipated to be reconstructed and widened to a three-lane roadway within the next 10-15 years.

The 2050 Bike Ped Plan with existing and proposed bicycle and pedestrian facilities is available upon request. The Bikeway Map will be provided in the Maps section of this RFP

B.   Scope of Work

The MPO is seeking a consultant that can not only provide the typical qualifications necessary in the development of the Grand Valley Pedestrian Crossing Study but also can provide proactiveness, vision, innovation, and collaboration in examining and proposing strategies and recommendations that will ensure a reduction of fatal and serious incidences for the users of all transportation modes.

The outline below is a proposed scope of work outline that will guide the development of the Grand Valley Pedestrian Crossing Study. The MPO includes the following scope of work to provide interested consultants insight into project intent, context, coordination, responsibilities, and other elements to help facilitate the Plans development.

This outline is not necessarily all inclusive. The consultant may include in the proposal additional performance tasks that will integrate innovative approaches to successfully complete the project. At a minimum, the consultant will be expected to establish detailed analyses, recommendations, and/or deliverables for the following tasks:

1. Project Management
   The consultant will be required to manage the study and coordinate with subconsultants, as well as bearing responsibility for all documentation and equipment needs. The consultant will identify a project lead from their team to act as the direct point of contact for the MPO project manager.

   The consultant should expect bi-weekly progress meetings with the MPO project manager. Additionally, the consultant should expect to prepare monthly progress reports, documentation of all travel and expense receipts, and prepare and submit invoices monthly. When submitting progress reports, the consultant will be required to outline the following performed work during the reporting period:
   - Upcoming tasks
   - Upcoming milestones
   - Status of scope and schedule
   - Any issues to be aware of

   Deliverable: A monthly progress report and detailed invoice. The monthly progress report should be sent to the project manager by the last Friday of each month to be included in the Technical Advisory Committee agenda.

   Building on the scope of work presented and incorporating any relevant changes made during contract negotiations, the consultant will prepare a detailed proposal and the achievable timeline for the Plan anticipated to be completed by July 31st, 2024. The proposal will outline the overall approach, as well as specific actions and activities that will occur during the project and how these will result in a successful conclusion to the study.

2. Community Engagement
   In compliance with the MPO's adopted Public Participation Plan (PPP), the consultant will develop and implement an extensive community engagement program that seeks to gain input from community members from all parts of the study area. Broad-based community engagement is considered critical to the success of this plan.

   It is imperative to consider the public and keep them informed of the planning activities and outcomes using strategies that include use of the internet and social media. Providing information to the MPO and other regional jurisdictions for posting on their websites will be required. New and innovative public engagement solutions are highly encouraged.

   a)   **Steering Committee**
        The consultant will use a Steering Committee (Committee) to provide input and oversight throughout the study process. The Committee will meet as needed to provide input and guidance through the study process, particularly on key decision points in the study. The consultant will be responsible for providing all information (support information such as maps, etc.) to be discussed at the Committee meetings eight days prior to the meeting. The consultant will prepare clear and concise briefings to present to the Committee. The consultant should expect at least six (6)

meetings with the Committee, which can be coordinated with public input meetings to make the most efficient use of any travel expenditure. The meetings need to have a virtual option.

Members of the Steering Committee could include:

NDDOT
Grand Forks Public Schools Representatives
Pedestrian And Cycling Advocacy Groups
City Engineers and Planners
Residents of the Grand Valley Area
Emergency Services Representatives
Grand Forks Public Health
Grand Forks Parks
Safe Kids
City Council Members
Grand Forks County Representatives
GF Township
County Commissioner
Property Owners
Developers
Crary

b) **Public Involvement Meetings**
The consultant should plan for a minimum of three (3) public meetings to identify the concerns and needs of businesses, regular users, and residents including pedestrian and bicycling needs. The consultant shall be required to submit its approach on how it will reach out to the community during the planning process. The consultant's approach should address:
  ➢ How it will go about these meetings.
  ➢ Methods it will employ.
  ➢ Quantity of rounds of public engagement meetings.
  ➢ Timing of engagement techniques the consultant is accustomed to utilizing to accomplish this task.

The consultant will be responsible for fully developing each round of public engagement before it is proposed to the MPO's project manager. Scheduling, presentations/written material, and development should occur well in advance of the proposed engagement event. All public comments are to be recorded as they pertain to the plan.

c) **Local Government Presentations**
The consultant should budget for at least three (3) sets of local government presentations to the Grand Forks Planning Commission, Grand Forks City Council, MPO Technical Advisory Committee (TAC), and the MPO Executive Committee at key Grand Valley Pedestrian Crossing Study milestones.

Deliverable: At the end of each meeting a memorandum with the meeting activities and results will be provided to the MPO. This will include documentation of comments/feedback and how they are incorporated into the final document. These will be gathered into a public involvement appendix in the final document.

3. Existing Conditions and Evaluation

Grand Valley Pedestrian Crossing Study is intended to cover the area between S Columbia Rd., Belmont Rd., 12th Ave NE (Merrifield Rd.), and 47th Ave S and should include a review of conditions and policy/infrastructure recommendations for City streets and other public surfaces streets inside the study area, including those owned and operated by NDDOT, and Grand Forks County. This task consists of a comprehensive multi-modal crash analysis and evaluation for the study area. This

- Analysis of existing conditions and historical trends to better understand crashes involving fatalities and serious injuries across the study area.
- Analysis of where crashes happen, by mode and severity, as well as contributing factors and crash types.
- Analysis of systemic and specific safety needs, such as general high risk road features within the street network, or specific needs relevant to types of road users.
- A geospatial analysis and depiction (preferably outline, searchable, and manipulable as feasible) of higher risk corridors and intersections across the study area.

Deliverable: A technical memorandum or chapter draft that will provide an analysis of the existing conditions. In addition to analyzing historical crash trends, the consultant should look ahead to anticipate future bike/pedestrian safety issues. This should make use of the historical analysis trends likely to continue forward and other developments on the horizon, including factors such as population characteristics in the MPO planning area. A separate technical memorandum should be drafted for the focus areas.

4. Goals, Objectives, Policies, and Performance Measures

Goals:

- Safety Enhancement: Improve pedestrian and cyclist safety in the Grand Valley development area.
- Non-Motorized Transportation Promotion: Encourage walking, biking, and other non-motorized forms of transportation within the study area.
- Community Connectivity: Foster better connectivity between residential areas, schools, and local amenities through a pedestrian crossing.
- Future-Proofing**:** Plan for future traffic growth and ensure infrastructure meets long-term needs.

Objectives:

- Determine Feasibility: Assess the technical, engineering, and financial feasibility of constructing a pedestrian crossing.
- Enhance Accessibility: Improve access for pedestrians and cyclists, especially students and residents.
- Safety Analysis: Conduct a comprehensive safety analysis, identifying potential hazards and safety improvements.
- Stakeholder Engagement: Engage with stakeholders to gather input and ensure community needs are considered.

Policies:

- Safety Priority: Prioritize safety considerations in all aspects of the pedestrian crossing design and construction.
- Non-Motorized Infrastructure: Promote the development of pedestrian and cyclist-friendly infrastructure.
- Sustainability: Incorporate sustainable design principles, such as energy-efficient lighting and environmentally responsible construction materials.
- Accessibility: Ensure the pedestrian crossing is ADA-compliant and accessible to all residents, including those with disabilities.

Performance Measures:

- Pedestrian/Cyclist Count: Measure the number of pedestrians and cyclists using the pedestrian crossing before and after its construction.
- Safety Improvement: Track the reduction in pedestrian and cyclist accidents in the study area.
- Public Satisfaction: Conduct surveys to gauge public satisfaction with the pedestrian crossing project and its impact on safety and convenience.
- Usage Patterns: Analyze how the pedestrian crossing affects commuting patterns and non-motorized transportation usage.

Deliverable:

Final Feasibility Study Report
This comprehensive report will encapsulate the study's goals, objectives, policies, and performance measures. It will provide detailed findings, recommendations, and analyses related to the feasibility of constructing a pedestrian crossing in the Grand Valley development area. The report will cover technical and engineering considerations, safety assessments, stakeholder engagement, cost estimation, alternative solutions, and any other relevant aspects of the study. Additionally, it will include performance data and metrics, showcasing how the proposed pedestrian crossing aligns with the established goals and objectives while addressing policies for safety, accessibility, and sustainability.

5. Implementation and Project Identification

The consultant will create an implementation matrix that outlines prospective projects, strategies, and suggestions for future grant applications, as well as measures that can be incorporated into regular maintenance cycles. It will also explore potential enhancements to better align with safety best practices. This implementation matrix will acknowledge the requirements of all transportation system users within the MPO planning area. It will identify projects suitable for grant funding, provide a conceptual framework for infrastructure enhancements with estimated costs, and establish an implementation schedule.

The strategies and recommendations will factor in the fiscal and staff time resources essential for a sustained and effective endeavor to achieve traffic safety goals and fulfill the study's objectives. Furthermore, the consultant will develop a timeline indicating project readiness for each strategy and project, categorizing them as short-term, mid-term, and long-term.

Deliverable:

Produce an implementation plan delineating prospective projects for future grant opportunities.

6. Final Plan & Executive Summary

The consultant will develop a draft study document with two rounds of review and revision before preparing a final study document. Review and receive comments from the Committee and update accordingly prior to proceeding through the MPO process.

The consultant will develop a draft final document and provide final copies for review by the Committee, NDDOT, the MPO, and the City of Grand Forks.

The consultant shall also provide the MPO with appropriate presentation materials and be prepared to present the final document.

Upon completion of the final plan, the consultant will develop an executive summary which relays all pertinent information in an easy-to-follow format. The summary should be concise and highly graphic, highlighting all major recommendations of the plan.

C. Project Deliverables

The final product of this effort will document the results of fulfilling the scope of work.

1. First full draft preliminary document by noon September 6th, 2024
2. A draft final document by noon October 4th, 2024
3. An approved final plan by November 22nd, 2024 (12 full printed copies)

An electronic copy of the approved final reports will be delivered to the Grand Forks-East

Grand Forks MPO in PDF and Word format. The electronic copies should be complete and in order such that additional copies of either document could be printed on-demand. In addition, electronic copies of any working papers, data, modeling software, and maps used to create information in the document will be delivered to the MPO either during the project or at its conclusion.

D.   Estimated Project Budget

This project has a not-to-exceed budget of $150,000. Consultants submitting proposals are asked to use underlined DOT rates when completing their Cost Proposal Form and certify the indirect costs with the Certification of Final Indirect Costs (See Appendix B).

E.   Other Requirements

The consultant will update the Project Manager on the aforementioned bi-weekly meetings and will also provide a written monthly progress report which will clearly reflect progress, timeliness, and budget expenditure. The monthly progress report will be presented by the MPO project manager to the MPO's Technical Advisory Committee. The consultant must provide the progress report by the last Friday of each month.

As part of the MPO's efforts to track consultant history the MPO will do an end-of-project evaluation of the consultant. This will be shared with the consultant for their information. This form can be found in Appendix C.

VIII. Map of Project Area
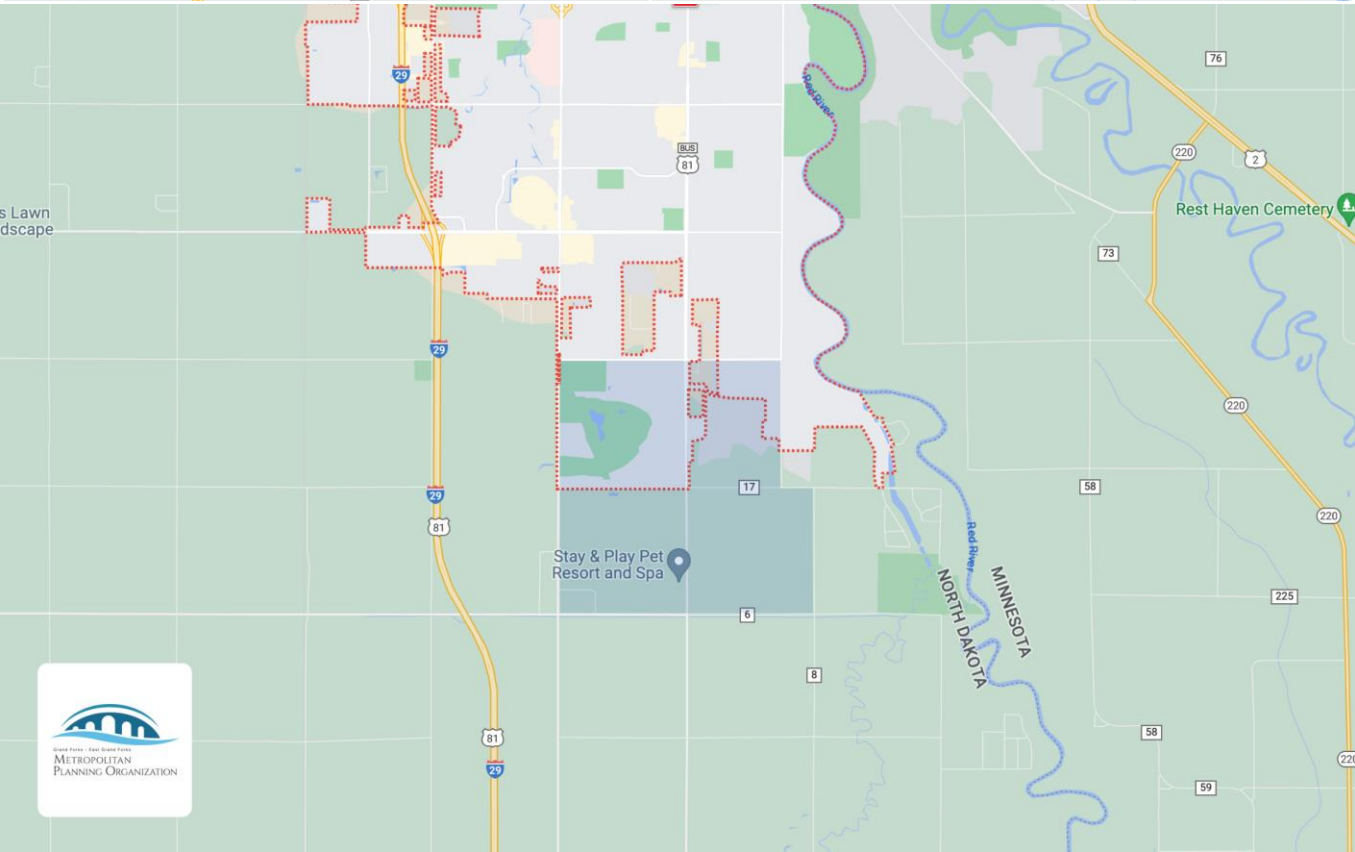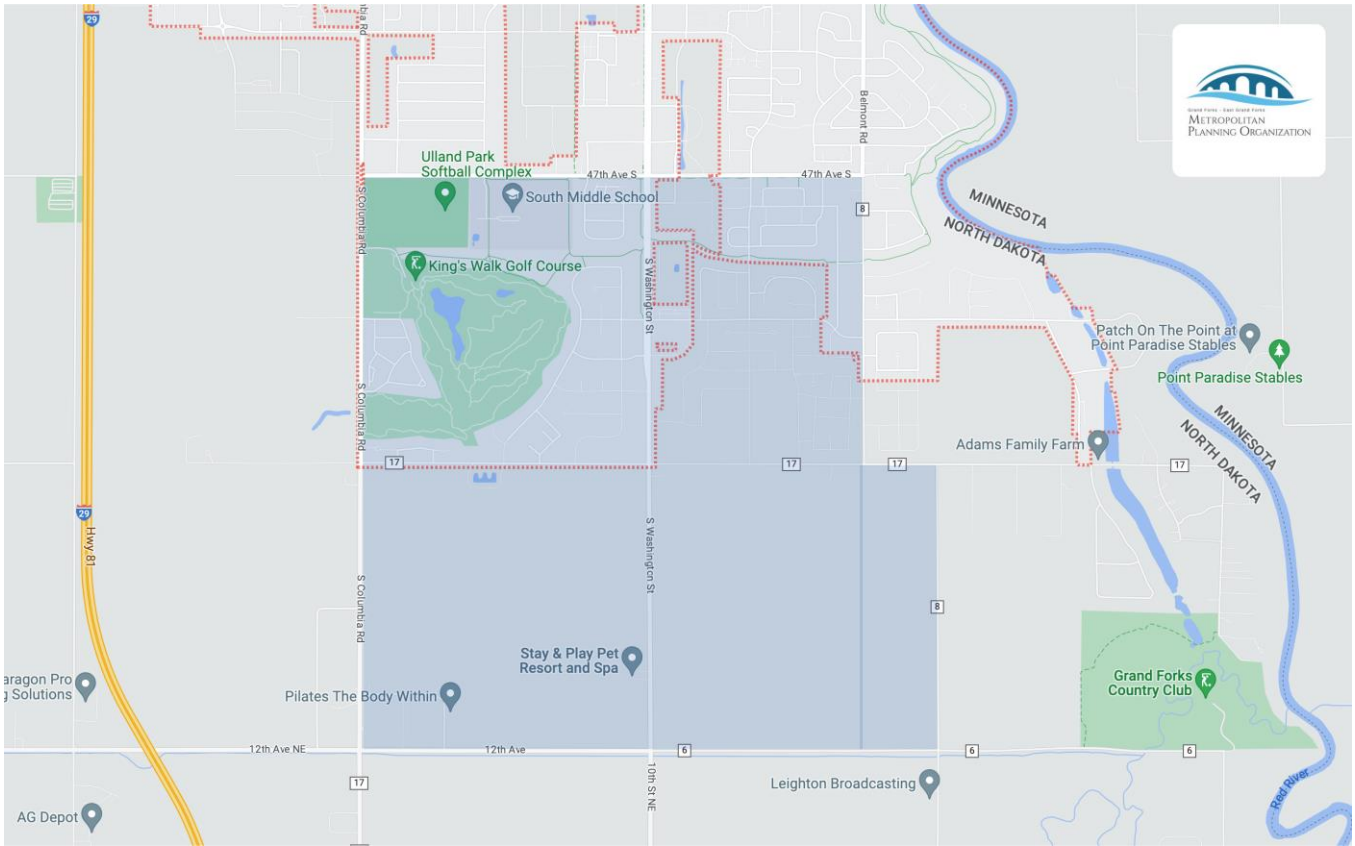
Appendix A
Attachments 1 & 2

<u>Government-Wide Debarment and Suspension (Non-procurement)</u>
49 CFR Part 29, Executive Orders 12549, 12689, and 31 U.S.C. 6101 (Contracts over $25,000)

<u>Background and Applicability</u>

In conjunction with the Office of Management and Budget and other affected Federal agencies, DOT published an update to 49 CFR Part 29 on November 26, 2003. This government-wide regulation implements Executive Oder 12549, Debarment and Suspension, Executive Order 12689, Debarment and Suspension, and 31 U.S.C. 6101 note (Section 2455, Public Law 103-355, 108 Stat. 3327).

The provisions of Part 29 apply to all grantee contracts and subcontracts at any level expected to equal or exceed $25,000 as well as any contract or subcontract (at any level) for Federally required auditing services. 49 CFR 29.220(b). This represents a change from prior practice in that the dollar threshold for application of these rules has been lowered from $100,000 to $25,000. These are contracts and subcontracts referred to in the regulation as "covered transactions."

Grantees, contractors, and subcontractors (at any level) that enter into covered transactions are required to verify that the entity (as well as its principals and affiliates) they propose to contract or subcontract with is not excluded or disqualified. They do this by (a) Checking the Excluded Parties List System, (b) Collecting a certification from that person, or (c) Adding a clause or condition to the contract or subcontract. This represents a change from the prior practice in that certification is still acceptable but is no longer required. 49 CFR 29.300.

Grantees, contractors, and subcontractors who enter into covered transactions also must require the entities they contract with to comply with 49 CFR 29, subpart C and include this requirement in their own subsequent covered transactions (i.e., the requirement flows down to subcontracts at all levels).

<u>Instructions for Certification:</u> By signing and submitting this bid or proposal, the prospective lower tier participant is providing the signed certification set out below.

<u>Suspension and Debarment</u>
This contract is a covered transaction for the purposes of 49 CFR Part 29. As such, the contractor is required to verify that none of the contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as define at 49 CFR 29.940 and 29.945.

The contractor is required to comply with 49 CFR 29, Subpart C and must include the requirements to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into. By signing and submitting its bid or proposal, the bidder or proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by the recipient. If it is later determined that the bidder or proposer knowingly rendered an erroneous certification, in addition to the recipient, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The bidder or proposer agrees to comply with the requirements of 49 CFR 29, Subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

Contractor _____

Signature of Authorized Official _____ **Date** ___/___/_____

Name & Title of Contractor's Authorized Official_____

Certification of Restriction on Lobbying

I _____, hereby certify on behalf of _____

      (Name & Title of grantee official)   (Name of grantee)

that:

(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of the Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying" in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including sub-contracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance is placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, US Code. Any person who fails to file the required certification shall be subject to civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Executed this _____ day of _____, _____

By _____

                     (Signature of Authorized Official)

_____

                     (Title of Authorized Official)

Cost Quote Form

(Include completed cost form in a separate page labeled "Cost Form- Vender Name" and submit with technical proposal as part of overall response.)

Cost Quote Form

The cost estimated should be based on a not to exceed cost as negotiated in discussion with the most qualified contractor. Changes in the final contract amount and contracted extensions are not anticipated.

Required Budget Format
Please Use Audited DOT Rates Only

1. Direct Labor	Hours	X	Rate	=	Total
Name, Title, Function	0.00	X	0.00	=	$0.00
		X		=	0
		X		=	0
		X		=	0
1. Subtotal- Direct Labor					
2. Overhead					
3. General & Administrative Overhead					
4. Subcontractor Costs					
5. Materials and Supplies Costs					
6. Travel Costs					
7. Fixed Fee					
8. Miscellaneous Costs					
Total Cost					

Certification of Final Indirect Costs

Firm Name: _____

Proposed Indirect Cost Rate: _____

Date of Proposal Preparation (mm/dd/yyyy): _____

Fiscal Period Covered (mm/dd/yyyy to mm/dd/yyyy): _____

I, the undersigned, certify that I have reviewed the proposal to establish final indirect cost rates for the fiscal period as specified above and to the best of my knowledge and belief:

1. All costs included in this proposal to establish final indirect cost rates are allowable in accordance with the cost principles of the Federal Acquisition Regulations (FAR) of title 48, Code of Federal Regulations (CFR), part 31.

2. This proposal does not include any costs which are expressly unallowable under the cost principles of the FAR of 48 CFR 31.

All known material transactions or events that have occurred affecting the firm's ownership, organization and indirect cost rates have been disclosed.

Signature: _____

Name of Certifying Official (Print): _____

Title: _____

Date of Certification (mm/dd/yyyy): _____

MPO Staff Report

Technical Advisory Committee:
February 14, 2024

MPO Executive Board:
February 21, 2024

RECOMMENDED ACTION: Announcement of the Carbon Reduction Program funding solicitation. Approval of current project using the advanced funds for the 2024 project.
TAC RECOMMENDED ACTION:

Matter of announcement of the Carbon Reduction Program funding for FY2025

Background:
The Carbon Reduction Program is a new program created by the Infrastructure Investment and Jobs Act (IIJA). President Biden signed into law the Infrastructure and Jobs Act on November 15, 2021. It established the Carbon Reduction Program and funds with $1.234 billion in FY2022 with an annual increase of approximately 1.9%. Minnesota will receive approximately $20.5 million annually with an annual increase of approximately 1.9%.

Program funding is assigned into two main categories with subcategories:
- Areas based on population (65%)
    - Urban areas with a population greater than 200,000
    - Urban areas with a population between 50,000 and 200,000
    - Urban areas with a population between 5,000 and 49,999
    - Areas with populations of less than 5,000
- Statewide (35%)

Cities and counties submit projects to MPOs, and ATPs based on the project location. The MPO or ATP reviews and priorities projects. The available funding to the MPO Area in Minnesota in 2025 and future years is very small for a project in each year. East Grand Forks has a project in the current FY2024 that the available federal Carbon reduction funds do not cover at the possible 80% of the project.

Current Federal Target	FY 24 SP 119-090-007	FY 25	FY 26	FY 27	FY 28
ATP		$580,000	$590,000	$370,000	$370,000
MPO	$35,020	$20,000	$30,000	$18,000	$18,000

The MPO and ATP could organize their funding targets over the Transportation Improvement Program (TIP) funding years. This option advances the MPO's fiscal year 2026, 2027, and 2028 Carbon Reduction Program (CRP) funding targets to fiscal year 2025 by reducing the ATP's fiscal year 2025 CRP funding target. The MPO's CRP funding targets in 2026, 2027, and 2028 would be reduced to zero dollars. The ATP's CRP funding targets in 2026, 2027, and 2028 would be increased by the dollar amount advanced by the MPO in those years.

| Optional Federal Target Swap	FY 24 SP 119-090-007	FY 25	FY 26	FY 27	FY 28
ATP		$514,000	$620,000	$388,000	$388,000
MPO	$35,020	$86,000	$0	$0	$0

This would result in an even exchange of funding. East Grand Forks would then use the advance fund for the 2024 project.

Findings and Analysis
- [INFORMATION: Carbon Reduction Program (CRP) Implementation Guidance (dot.gov)](#)
- [Carbon Reduction Program - MnDOT (state.mn.us)](#)

Support Materials:
- Map of trail and sidewalk project on 4th St NW and 5th Ave NW.

NORTH

0   30   60

Scale in Feet
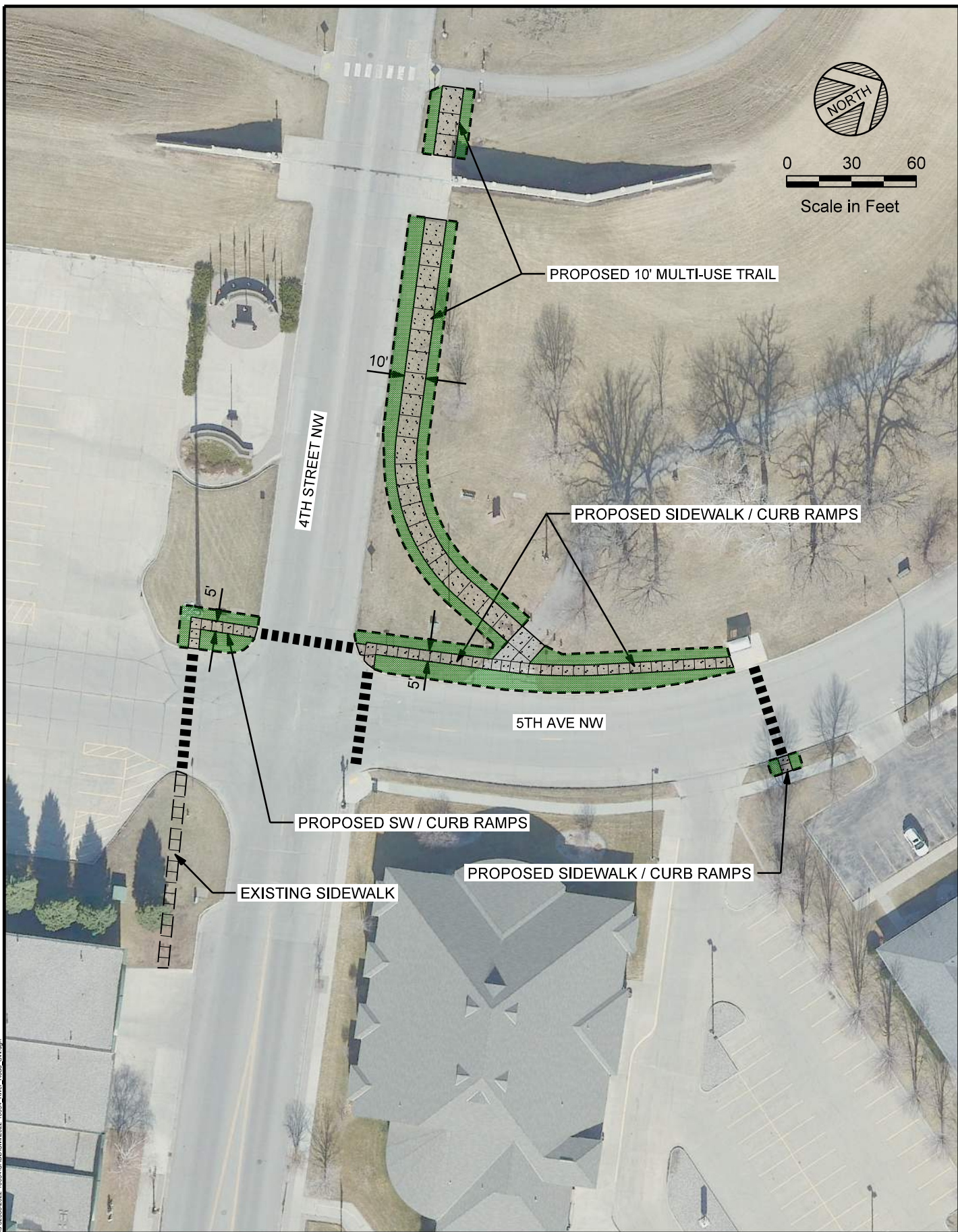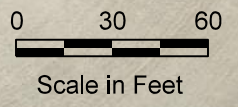
PROPOSED 10' MULTI-USE TRAIL

10'

4TH STREET NW

PROPOSED SIDEWALK / CURB RAMPS

5'

5'

5TH AVE NW

PROPOSED SW / CURB RAMPS

PROPOSED SIDEWALK / CURB RAMPS

EXISTING SIDEWALK

10/12/2022\City of East Grand Forks-32358\2022-10054\CADD\Civil\2022-10054_River_Road_SW.dgn

WIDSETH
ARCHITECTS ▪ ENGINEERS ▪ SCIENTISTS ▪ SURVEYORS

DATE:	10/05/22
SCALE:	AS SHOWN
DRAWN BY:	RAB
CHECKED BY:	SRE
JOB NUMBER:	2022-10054

CITY OF EAST GRAND FORKS
PROPOSED SIDEWALK & RAMPS
EAST GRAND FORKS, MINNESOTA

PROJECT LOCATION MAP

SHEET NO.

C1.0

SHEET

OF

MPO Staff Report

Technical Advisory Committee:
February 14, 2024

MPO Executive Board:
February 21, 2024

RECOMMENDED ACTION: Approval of the 2024-2027 TIP Amendment #3.

TAC RECOMMENDED ACTION:

Matter of approval of the 2024-2027 TIP Amendment #3 to the MPO Executive Board.

Background:

The MPO has adopted the 2024-2027 TIP. All projects or phases of the project included in the adopted TIP will be programmed to the amount needed to complete the project or phase and in a time frame that allows all project requirements to be met by the deadline. Unfortunately, project costs may rise or fall because of forces outside the project sponsor's control. In the same way, projects may not be able to be completed in the time frame originally estimated. For these and other reasons, sponsors may find it necessary to request revisions to the adopted TIP.

The MPO received two requests to amend the 2024-2027 TIP.

Proposed amendments to the TIP:

- NDDOT brought forward a multi county rehabilitation project. The full cost of the project is stated in the TIP.

124013	23888	NDDOT	2024	Eastern North Dakota	Various		Maintenance of ATR Sites	Rehabilitation	SS	$1,794,232	$1,435,385	$358,847					Amend 3

- MnDOT has worked with the ATP to advance funds so that East Grand Forks can use future years of funding for the project they are constructing this year.

223039	119-090-007	City of East Grand Forks	2024	5th Ave NW		**CRP**AC**CITY OF EAST GRAND FORKS: INSTALL SIDEWALK ALONG 5TH AVE NW FROM 4TH STNW TO THE BUS SHELTER NORTH OF 4TH ST NW AND INSTALL TRAIL ALONG 4TH ST NW FROM 5TH AVE NW TO EXISTING TRAIL WEST OF THE FLOODWALL (AC OF PAYBACK OF $86,000 IN 2025)	Construction	CRP	$104,149 $169,000	$35,020 $121,020					$69,129 $47,980		Amend 3
223039	119-090-007	City of East Grand Forks	2025	5th Ave NW		**AC** **CRP**CITY OF EAST GRAND FORKS: INSTALL SIDEWALK ALONG 5TH AVE NW FROM 4TH ST NW TO THE BUS SHELTER NORTH OF 4TH ST NW AND INSTALL TRAIL ALONG 4TH ST NW FROM 5TH AVE NW TO EXISTING TRAIL WEST OF THE	Construction	CRP	$86,000	$86,000							Amend 3

Findings and Analysis

- The proposed project amendments are consistent with the MPO MTP.

Support Materials:

- Updated Project Listings.
- Public Notice

2024 Grand Forks-East Grand Forks MPO Projects

MPO ID	State Project Number	Lead Agency	Project Year	Project Location	Project Limits From	Project Limits To	Description	Type of Work	Federal Program Source	Total Cost	Federal	State ND	State MN-TH	State MN-Other	Local General Fund	Local Other	Date Amended/ Modified
Grand Forks Transit																	
120001		CAT-Grand Forks	2024	City of Grand Forks			Operating for Grand Forks transit service. Service will operate 6 days a week and averages 62.5 hours of revenue service daily.	Transit Operation	FTA 5307	$3,673,170	$1,285,166	$279,026			$1,126,485	$982,504	
120002		CAT-Grand Forks	2024	City of Grand Forks			Capital Purchase/Replacement of safety and/or security hardware and software.	Transit Capital	FTA 5307	$20,822	$17,352				$3,470		
123008		CAT-Grand Forks	2024	City of Grand Forks			Replacement Class 400 Low Floor Bus	Transit Capital	FTA 5339	$151,000	$128,350				$22,650		
123003		CAT-Grand Forks	2024	City of Grand Forks			Mobility Manager Position	Transit Capital	FTA 5310	$83,981	$67,184				$16,797		
123007		CAT-Grand Forks	2024	City of Grand Forks			Replace Four (4) Dial-A-Ride Vans	Transit Capital	FTA 5310	$68,450	$58,182				$10,268		
East Grand Forks Transit																	
220001	TRF-0018-24B	East Grand Forks	2024	East Grand Forks			SECT 5307: EAST GRAND FORKS FIXED ROUTE TRANSIT OPERATING ASSISTANCE	Transit Operations	FTA 5307	$586,240	$127,310			$320,944	$137,986		
220002	TRF-0018-24A	East Grand Forks	2024	East Grand Forks			EAST GRAND FORKS DAR TRANSIT OPERATING ASSISTANCE	Transit Operations	SF	$167,913				$142,726	$25,187		
220003	TRS-0018-24C	East Grand Forks	2024	East Grand Forks			CITY OF EAST GRAND FORKS PURCHASE ONE(1) CLASS 400 LF REPLACEMENT GAS BUS	Transit Capital	STPBG	$276,000	$220,800			$27,600	$27,600		
NDDOT																	
120004	23348	NDDOT	2024	Grand Forks			Rehab traffic signals on the Urban Regional Roads system troughout Grand Forks.	Rebabilitation	NHU	~~$6,668,000~~ $5,792,270	~~$5,334,400~~ $4,633,816	~~$1,058,700~~ $919,813			~~$274,900~~ $238,641		Amend 2
123048	23415	NDDOT	2024	Grand Forks District	Various		Signing	Safety	HES	$414,000	$331,200	$83,000					
119004	22167	NDDOT	2024	N Washington St	5th Ave S	1st Ave N	Roadway Reconstruction & Structure Rehabilitation, Lift Station	Reconstruction	NHU	$11,150,000	$9,023,696	$1,011,304			$1,115,000		
120006a		NDDOT	2024	I-29 SB	S of ND 15 (Thompson)	Near 32nd Ave	CPR and Grinding	Rehabilitation	IM	$1,173,000	$1,056,000	$117,000					
123047	24057	NDDOT	2024	I-29	32nd Ave S Interchange		Roadside Improvement- Lighting	Lighting	IM	$1,000,000	~~$800,000~~ $900,000	~~$200,000~~ $100,000					Amend 2

Current amendments are highlighted in yellow. What is or was changed is written in red.

2024 Grand Forks-East Grand Forks MPO Projects

MPO ID	State Project Number	Lead Agency	Project Year	Project Location	Project Limits From	Project Limits To	Description	Type of Work	Federal Program Source	Total Cost	Federal	State ND	State MN-TH	State MN-Other	Local General Fund	Local Other	Date Amended/Modified
123041	23740	NDDOT	2024	US-2 EB/ Gateway Dr	N 3rd St		Spall Repair	Bridge	NH	$50,000	$40,000 $40,465	$10,000 $9,535					Amend 2
124011	24178	NDDOT	2024	Grand Forks District	Various		Pavement marking	Safety	HES	$1,953,869	$1,563,095	$390,774					Amend 2
124013	23888	NDDOT	2024	Eastern North Dakota	Various		Maintenance of ATR Sites	Rehabilitation	SS	$1,794,232	$1,435,385	$358,847					Amend 3
City of Grand Forks																	
120003	23646	City of Grand Forks	2024	N Columbia Rd	9th Ave S	2nd Ave N	Structure rehabilitation to Columbia Rd Overpass	Rehabilitation	NHU	$8,930,000 $9,007,000	$6,744,000 $7,205,600				$2,186,000 $1,801,400		Amend 2
120007	23880	City of Grand Forks	2024	S 5th St	Belmont Rd, Division Ave		Construct a roundabout at the intersection	Construction	UGP	$1,640,600	$1,312,480				$328,120		
123022	23912	City of Grand Forks	2024	S 48th St	17th Ave S	32nd Ave S	Convert exsisting gravel path to concrete shared-use path.	Bike/Ped	TAU	$1,220,000 $1,100,000	$637,308				$582,692 $462,692		Amend 2
MnDOT																	
220004	6001-68	MnDOT	2024	DeMers Ave (US-2B)	2nd St NW & 4th St NW / 4th St NW		**PRS**: US 2B, IN EAST GRAND FORKS, AT 2ND ST NW & 4TH ST NW, SIGNAL SYSTEM REPLACEMENT AND ADA IMPROVEMENTS **PRS**: US 2B, IN EAST GRAND FORKS, AT 4TH ST NW, SIGNAL SYSTEM REPLACEMENT AND ADA IMPROVEMENTS	Traffic Signal Revision	NHPP	$700,000 $499,000	$284,970 $228,790		$65,030 $52,210		$350,000 $218,000		Amend 2
223040	6017-45	MnDOT	2024	MN 220	CSAH 19	0.3 miles South of CSAH 22	**CHAP 3**AC**: MN 220 FROM CSAH 19 (EAST GRAND FORKS) TO 0.3 MI S JCT CSAH 22, GRADING AND CONCRETE PAVEMENT AND INSTALL MOMENT SLAB FOR GUARDRAIL OVER BOX CULVERT BR 95119 (AC PROJECT, PAYBACK IN 2036)	Reconstruction	STBGP	$15,500,000	$12,620,100		$2,879,900				
City of East Grand Forks																	
223039	119-090-007	City of East Grand Forks	2024	5th Ave NW			**CRP**AC**CITY OF EAST GRAND FORKS: INSTALL SIDEWALK ALONG 5TH AVE NW FROM 4TH STNW TO THE BUS SHELTER NORTH OF 4TH ST NW AND INSTALL TRAIL ALONG 4TH ST NW FROM 5TH AVE NW TO EXISTING TRAIL WEST OF THE FLOODWALL (AC OF PAYBACK OF $86,000 IN 2025)	Construction	CRP	$104,149 $169,000	$35,020 $121,020				$69,129 $47,980		Amend 3
Totals										$54,677,315	$41,634,094	$2,910,452	$2,944,930	$491,270	$5,714,276	$982,504	

Current amendments are highlighted in yellow. What is or was changed is written in red.

2025 Grand Forks-East Grand Forks MPO Projects

MPO ID	State Project Number	Lead Agency	Project Year	Project Location	Project Limits From	To	Description	Type of Work	Federal Program Source	Total Cost	Federal	State ND	MN- TH	MN-Other	Local General Fund	Other	Date Amended/ Modified
Grand Forks Transit																	
121001		CAT-Grand Forks	2025	City of Grand Forks			Operating for Grand Forks transit service. Service will operate 6 days a week and averages 62.5 hours of revenue service daily.	Transit Operation	FTA 5307	$3,764,999	$1,317,295	$286,001			$1,154,647	$1,007,066	
121002		CAT-Grand Forks	2025	City of Grand Forks			Capital Purchase/Replacement of safety and/or security hardware and software.	Transit Capital	FTA 5307	$21,030	$17,525				$3,505		
123003		CAT-Grand Forks	2025	City of Grand Forks			Purchase Hydrogen Fuel Bus.	Transit Capital	FTA 5339	$975,000	$828,750				$146,250		
123004		CAT-Grand Forks	2025	City of Grand Forks			Training Personnel	Transit Capital	FTA 5339	$150,000	$120,000				$30,000		
123006		CAT-Grand Forks	2025	City of Grand Forks			Mobility Manager Position	Transit Capital	FTA 5310	$86,500	$69,200				$17,300		
East Grand Forks Transit																	
221001	TRF-0018-25B	East Grand Forks	2025	East Grand Forks			SECT 5307: EAST GRAND FORKS FIXED ROUTE TRANSIT OPERATING ASSISTANCE	Transit Operations	FTA 5307	$603,830	$131,130			$330,573	$142,127		
221002	TRF-0018-25A	East Grand Forks	2025	East Grand Forks			EAST GRAND FORKS DAR TRANSIT OPERATING ASSISTANCE	Transit Operations	SF	$156,380				$129,736	$26,644		
NDDOT																	
121005	23903	NDDOT	2025	US-2B	Sorlie Bridge		Expansion Joint Modification	Rehabilitation	NH	$27,040	$21,883	$2,453			$2,704		
120006b		NDDOT	2025	I-29, NB	ND 15	32nd Ave S	CPR, grinding of I-29 near the 32nd Ave S interchange to ND 15 (Thompson) interchange.	Rehabilitation	IM	$1,220,000 $1,220,111	$1,098,000 $1,098,055	$122,000 $122,056					Amend 2
120005	23333	NDDOT	2025	I-29	Buxton Interchange	32nd Ave S	High tension median cable gaurdrail. Portion in MPO area	Safety	HEN	$4,469,000	$4,022,000	$447,000					
123046		NDDOT	2025	I-29	3 miles S of US-2		Structure Paint	Rehabilitation	IM	$286,000	$257,000 $257,400	$29,000 $28,600					Amend 2
121006	24028	NDDOT	2024 2025	I-29, NB & SB	32nd Ave S Interchange	North of US-81 Interchange	CPR, Spall Repairs, Crack Sealing, Grinding, Appr Slab Repair	Rehabilitation	IM	$8,512,604 $2,440,172	$7,661,343 $2,196,155	$851,261 $244,017					Amend 1, Amend 2
123042	24028	NDDOT	2024 2025	I-29 NB	3 miles S of US-2		Spall Repair, Approch Slabs, Expan Joint Mod, Struct/Incid	Bridge	IM	$676,000 $702,562	$608,000 $632,306	$68,000 $70,256					Amend 2

Current amendments are highlighted in yellow. What is or was amended is written in red.

2025 Grand Forks-East Grand Forks MPO Projects

MPO ID	State Project Number	Lead Agency	Project Year	Project Location	Project Limits From	Project Limits To	Description	Type of Work	Federal Program Source	Total Cost	Federal	State ND	State MN-TH	State MN-Other	Local General Fund	Local Other	Date Amended/ Modified
123043	24028	NDDOT	2024 2025	I-29, NB &SB	1 mile S of US-2		Deck Overlay, Spall Repair, Struct/Incid	Bridge	IM	$1,884,000 $1,088,568	$1,696,000 $969,901	$188,000 $118,667					Amend 2
123044	24028	NDDOT	2024 2025	I-29, NB &SB	Junction US-2		Deck Overlay, Expan Joint Mod, Spall Repair, Approach Slabs	Bridge	IM	$2,236,000 $2,324,192	$201,200 $2,091,772	$224,000 $232,420					Amend 2
123045	24028	NDDOT	2024 2025	I-29, NB &SB	Junction US-81		Spall Repair, Struct/Incid	Bridge	IM	$300,000 $312,000	$270,000 $280,800	$30,000 $31,200					Amend 2
124012	24200	NDDOT	2025	I-29 & ND 89	Various		Structure Paint, Structure Items	Rehabilitation	SS	$1,222,000	$988,965	$233,035					Amend 2
City of Grand Forks																	
121007	23668	City of Grand	2025	Various			Install dynamic speed signs at various school zone location.	Safety	HEU	$40,000	$36,000				$4,000		
123032	24028	NDDOT	2024 2025	I-29	University Ave		Structure Repair/Rehab	Rehabilitation	SU	$104,000	$84,167				$19,833		Amend 2
120008	24134	City of Grand Forks	2025	N 4th St	1st Ave N	2nd Ave N	Reconstruction of N 4th St between 1st Ave N and 2nd Ave N.	Reconstruction	URP	$2,700,000 $2,805,000	$2,160,000 $2,244,000				$540,000 $561,000		Amend 1, Amend 2
City of East Grand Forks																	
223041		City of East Grand Forks	2025	2025	TBD		**CRP**2025 SET ASIDE		CRP	$25,000	$20,000				$5,000		Amend 3
223039	119-090-007	City of East Grand Forks	2025	5th Ave NW			**AC** **CRP**CITY OF EAST GRAND FORKS: INSTALL SIDEWALK ALONG 5TH AVE NW FROM 4TH ST NW TO THE BUS SHELTER NORTH OF 4TH ST NW AND INSTALL TRAIL ALONG 4TH ST NW FROM 5TH AVE NW TO EXISTING TRAIL WEST OF THE FLOODWALL.	Construction	CRP	$86,000	$86,000						Amend 3
Total										$22,884,384	$17,409,304	$1,815,705		$460,309	$2,108,010	$1,007,066	

Current amendments are highlighted in yellow. What is or was amended is written in red.

2026 Grand Forks-East Grand Forks MPO Projects

MPO ID	State Project Number	Lead Agency	Project Year	Project Location	Project Limits From	Project Limits To	Description	Type of Work	Federal Program Source	Total Cost	Federal	State ND	State MN-TH	State MN-Other	Local General Fund	Local Other	Date Amended/ Modified
Grand Forks Transit																	
122001		CAT-Grand Forks	2026	Grand Forks			Operating for Grand Forks transit service. Will operate 6 days a week for an average of 62.5 hours of revenue service daily.	Transit Operations	FTA 5307	$3,859,135	$1,350,227	$293,151			$1,183,514	$1,032,243	
122002		CAT-Grand Forks	2026	Grand Forks			Capital Purchase/Replacement of safety and/or security hardware and software.	Transit Capital	FTA 5307	$21,240	$17,700				$3,540		
123013		CAT-Grand Forks	2026	Grand Forks			Mobility Manager Position	Transit Capital	FTA 5310	$89,095	$71,276				$17,819		
123009		CAT-Grand Forks	2026	Grand Forks			Replace Four (4) DAR Vans	Transit Capital	FTA 5310	$68,450	$58,182				$10,268		
East Grand Forks Transit																	
222001	TRF-0018-26B	East Grand Forks	2026	East Grand Forks			SECT 5307: EAST GRAND FORKS FIXED ROUTE TRANSIT OPERATING ASSISTANCE	Transit Operations	FTA 5307	$621,945	$135,000			$340,533	$146,412		
222002	TRF-0018-26A	East Grand Forks	2026	East Grand Forks			EAST GRAND FORKS DAR TRANSIT OPERATING ASSISTANCE	Transit Operations	SF	$161,070				$133,627	$27,443		
NDDOT																	
122007	22786	NDDOT	2026	I-29	47th Ave S		~~Construction of a new interchange south of Grand Forks.~~ Right-of-way purchase for new interchange	~~Construction~~ ROW	~~NHU~~ IM	~~$57,000,000~~ $2,500,000	~~$45,600,000~~ $2,250,000	~~$5,700,000~~ $250,000			~~$5,700,000~~		Amend 1
123021	23283	NDDOT	2026	Grand Forks District	Various		Installing LED lighting throughout Grand Forks & Minot Districts. This includes the MPO Area	Preventative Maintenance	SS	$1,000,000	$809,000	$191,000					
City of Grand Forks																	
122009	23669	City of Grand Forks	2026	S Washington St	28th Ave S		Intersection improvements at 28th Ave S. Adding length to left turn lane.	Safety	HEN	$279,000	$251,000	$13,950			$13,950		
522008	24056	Grand Forks	2026	Point Bridge			Rehabilitation of the Point Bridge (ND BR#0000GF02 & MN BR#60506) over the Red River of the North	Rehabilitation	SU	$1,150,000	$920,000				$230,000		
123011		City of Grand Forks	2026	S 48th St	10th Ave S	17th Ave S	Reconstruction of Roadway	Reconstruction	URP	$6,380,000	$5,104,000				$1,276,000		

Current amendments are highlighted in yellow. What is or was amended is written in red.

2026 Grand Forks-East Grand Forks MPO Projects

MPO ID	State Project Number	Lead Agency	Project Year	Project Location	Project Limits From	To	Description	Type of Work	Federal Program Source	Total Cost	Federal	State ND	MN-TH	MN-Other	Local General Fund	Other	Date Amended/ Modified
118001	~~15857~~ 24115	City of Grand Forks	~~2025~~ 2026	42nd St	DeMers Ave		Railroad grade seperation	Construction	~~SecR~~ RCE	~~$53,600,000~~ $60,000,000	~~$30,000,000~~ $37,500,000	~~$11,700,000~~ $4,200,000			~~$10,400,000~~ $16,800,000	$1,500,000	Amend 1, Amend 2
Grand Forks County																	
323001		Grand Forks County	2026	32nd Ave S	Railraod Tracks	Co Rd 5	Asphalt Mill & Overly, 3 miles.	Rehabilitation	Non NHS-U	$700,000	$560,000				$140,000		
City of East Grand Forks																	
522008	119-113-008	East Grand Forks	2026	Hwy MSAS 113 (Point Bridge)			IN GRAND FORKS AND EAST GRAND FORKS, MSAS 113, (1ST ST NE) REHAB THE POINT BRIDGE (MN BR#60506) (ND BR#0000GF02) OVER THE RED RIVER OF THE NORTH. INCLUDES MILL AND OVERLAY OF BRIDGE APPROACH ON 1ST ST SE IN EAST GRAND FORKS	Bridge Repair	STBGP	$1,800,000	$1,200,000				$600,000		
223042		East Grand	2026	TBD			**CRP**2026 SET ASIDE		CRP	$0	$0				$0		Amend 3

Totals										$77,629,935	$49,417,385	$4,757,101		$474,160	$20,448,946	$2,532,243

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2027 Grand Forks-East Grand Forks MPO Projects

MPO ID	State Project Number	Lead Agency	Project Year	Project Location	Project Limits From	Project Limits To	Description	Type of Work	Federal Program Source	Total Cost	Federal	State ND	State MN-TH	State MN-Other	Local General Fund	Local Other	Date Amended/ Modified
Grand Forks Transit																	
123001		CAT-Grand Forks	2027	Grand Forks			Operating for Grand Forks transit service. Will operate 6 days a week for an average of 62.5 hours of revenue service daily.	Transit Operation	FTA 5307	$3,941,534	$1,377,232	$293,151			$1,213,102	$1,058,049	
123002		CAT-Grand Forks	2027	Grand Forks			Capital Purchase/Replacement of safety and/or security hardware and software.	Transit Capital	FTA 5307	$21,452	$17,877				$3,575		
123014		CAT-Grand Forks	2027	Grand Forks			Mobility Manager Position	Transit Capital	FTA 5310	$91,767	$73,413				$18,354		
East Grand Forks Transit																	
223001	TRF-0018-27A	East Grand Forks	2027	East Grand Forks			SECT 5307: EAST GRAND FORKS FIXED ROUTE TRANSIT OPERATING ASSISTANCE	Transit Operations	FTA 5307	$646,823	$135,800			$340,682	$170,341		
223002	TRF-0018-27B	East Grand Forks	2027	East Grand Forks			EAST GRAND FORKS DAR TRANSIT OPERATING ASSISTANCE	Transit Operations	SF	$167,913				$142,726	$25,187		
222003	TRS-0018-27A	East Grand Forks	2027	East Grand Forks			CITY OF EAST GRAND FORKS PURCHASE ONE(1) CLASS 400 LF REPLACEMENT GAS BUS	Transit Vehicle Purchase	STBGP	$320,000	$256,000			$32,000	$32,000		
City of Grand Forks																	
123005		City of Grand Forks	2027	N Columbia Rd	US-2/ Gateway Dr		Safety improvements for the intersection.	Safety	HEU	$2,515,000	~~$1,962,000~~ $2,263,500				~~$553,000~~ $251,500		Amend 2
123012		City of Grand Forks	2027	S 48th St	DeMers Ave	10th Ave S	Reconstruction of roadway	Reconstruction	URP	$4,000,000	$3,200,000				$800,000		
121004		City of Grand Forks	2027	Columbia Rd	University Ave	8th Ave N	Reconstruction of roadway	Reconstruction	NHU	$7,302,000	$5,167,000				$2,135,000		
NDDOT																	
122005	23740	NDDOT	2027	US 2/ Gateway Dr	Red River	I-29	CPR & Grinding	Rehabilitation	NHU	$4,447,000	$3,557,600	$889,400					
124010	23739	NDDOT	2027	N Washington St	1st Ave N	8th Ave N	Reconstruction of roadway	Reconstruction	NHU	$5,147,000	$4,117,600	$514,700			$514,700		Amend 2

Current amendments are highlighted in yellow. What is or was amended is written in red.

2027 Grand Forks-East Grand Forks MPO Projects

MPO ID	State Project Number	Lead Agency	Project Year	Project Location	Project Limits		Description	Type of Work	Federal Program Source	Total Cost	Federal	State			Local		Date Amended/ Modified
					From	To						ND	MN- TH	MN-Other	General Fund	Other	
MnDOT																	
223020	6019-30	MnDOT	2027	US 2/ Gateway Dr	River Rd		US 2, (GATEWAY DR NW), EB & WB, IN EAST GRAND FORKS, REPLACE BRIDGE 60001 OVER 4TH ST NW (MSAS 122)	Bridge Replacement	NHPP	$6,000,000	$4,885,200		$1,114,800				
City of East Grand Forks																	
223043		East Grand Forks	2027	TBD			**CRP**2027 SET ASIDE			$0	$0				$0		Amend 3

Totals										$34,600,489	$25,051,222	$1,697,251	$1,114,800	$515,408	$5,163,759	$1,058,049

Current amendments are highlighted in yellow. What is or was amended is written in red.

Grand Forks - East Grand Forks
METROPOLITAN
PLANNING ORGANIZATION

PUBLIC NOTICE

The Grand Forks - East Grand Forks Metropolitan Planning Organization (MPO) will hold a public hearing on the proposed amendment to the MPO FY2024 to FY2027 Transportation Improvement Program (TIP). The TIP also incorporates the local transit operators' Program of Projects (POP). The hearing will be held during a regular, monthly meeting of the MPO's Technical Advisory Committee (TAC). It will be a hybrid meeting located in the Training Room of East Grand Forks City Hall, 600 DeMers Ave, East Grand Forks, MN or contact Forks MPO for the link to the meeting. The hearing will be held at 1:30 PM on February 14, 2024. The public, particularly special and private sector transportation providers, are encouraged to provide input via email at info@theforksmpo.org.

A copy of the proposed amendment is available for review and comment at the MPO website www.theforksmpo.org. Written comments on the proposed amendment can be submitted to the email address info@theforksmpo.org before noon on February 14, 2024. All comments received prior to noon on the meeting day will be considered part of the record of the meeting as if personally presented. If substantial changes occur to the document due to comments received, the MPO will hold another public hearing on the changes. For further information, contact Teri Kouba at 701-746-2660.

The GF-EGFMPO will make every reasonable accommodation to provide an accessible meeting facility for all persons. Appropriate provisions for the hearing and visually challenged or persons with limited English Proficiency (LEP) will be made if the meeting conductors are notified 5 days prior to the meeting date, if possible. To request language interpretation, an auxiliary aid or service (i.e., sign language interpreter, accessible parking, or materials in alternative format) contact Stephanie Halford of GF-EGFMPO at 701-746-2660. Materials can be provided in alternative formats: large print, Braille, cassette tape, or on computer disk for people with disabilities or with LEP by Stephanie Halford of GF-EGF MPO at 701-746-2660. TTY users may use Relay North Dakota 711 or 1-800-366-6888.

MPO Staff Report
Technical Advisory Committee:
February 14, 2024
MPO Executive Board:
February 21, 2024

RECOMMENDED ACTION: Discussion of Functional Classification.

TAC RECOMMENDED ACTION:

Matter of approval of the discussion of the functional classification.

Background:
In 2023, MPO staff worked with all our partners to adjust the Census defined Urbanized Area to an Urbanized Area that reflects the urban area we live and work in every day. The next step is for roadway functional classification to match the new urban boundary.

On January 8, 2024, North Dakota Department of Transportation (NDDOT) sent a letter requesting that Forks MPO begin the update of the roadway functional classification. NDDOT asks for a preliminary review to be submitted by April 1, 2024. Once NDDOT reviews and comments, the MPO has until July 1, 2024 to submit the final functional classification system.

In 2015, Minnesota Department of Transportation (MnDOT) completed a statewide reclassification. Starting in 2019 and ending in 2021, the MPO did a review and update of the functional classification for the North Dakota side of the Metropolitan Planning Area (MPA). Given the recent review MPO staff is mostly looking at a review of urban or rural classification.

NDDOT has pointed out that Federal Highway Administration (FHWA) has a document available for reference, *Highway Functional Classification Concepts, Criteria and Procedures, 2023 Edition*. NDDOT has three exceptions to FHWA guidance:
1. NDDOT will only recognize one classification of Principal Arterials.
2. NDDOT will only recognize one classification of Collectors.
3. NDDOT will recognize the design characteristics as desired for new functional classification requests, but they will not be a requirement for previously approved classifications.

The map in the support materials shows four sections of functionally classified roadway that are part of the rural system that would need to be part of the urban system. These sections were outside the previously adjusted urbanized area and with the newly adopted adjusted urbanized

area are now considered urban. Tables are provided that should the urban changes in mileage and the milage for the MPA.

MnDOT has not contacted the MPO currently about updating the functional classification for the Minnesota side of the MPA. MPO staff is reviewing the Minnesota side of the MPA at the same time. So far there are no recommended changes since there were few changes to the Urbanized Area that would impact the functionally classified roadway.

Findings and Analysis
- The proposed project amendments are consistent with the MPO MTP.

Support Materials:
▪ Letter from NDDOT.
▪ Map of current urban and rural functional classification with new urbanized area.
▪ Mileage tables.

January 8, 2024

Stephanie Halford
Executive Director
Grand Forks-East Grand Forks MPO
P.O. Box 5200
Grand Forks, ND 58206-5200

Dear Mrs. Halford:

SUBJECT: ROADWAY FUNCTIONAL CLASSIFICATION UPDATES TO ADJUSTED URBANIZED AREA BOUNDARY

Thank you for your efforts to complete the Adjusted Urbanized Area boundary before the Federal Highway Administration (FHWA) deadline of December 29, 2023. The next step in the update process related to the 2020 US Decennial Census is for the MPO to update the roadway functional classification to match the new boundary.

The North Dakota Department of Transportation (NDDOT) is requesting that you begin the update to the roadway functional classification system. The functional classification system identifies the roadways that will qualify for federal funding within various NDDOT funding programs. The functional class system needs to be well defined and make sense for the context of the roadway being classified. Roadway classification will consider various criteria such as, lane and shoulder widths, daily traffic volumes, access control, facility type, roadway function and any other contextual items relevant to the classification.

FHWA has prepared a guidance document for reference in updating the functional classification system. The document is called *Highway Functional Classification Concepts, Criteria and Procedures*, 2023 Edition. Here is a link to the document: https://www.fhwa.dot.gov/planning/processes/statewide/related/hwy-functional-classification-2023.pdf. This document provides real world examples as well as detailed information on each roadway classification. Please utilize this reference in your update process. There are a couple of exceptions to the guidance:
1. NDDOT will only recognize one classification of Principal Arterials.
2. NDDOT will only recognize one classification of Collectors.
3. NDDOT will recognize the design characteristics as desired for new functional classification requests, but they will not be a requirement for previously approved classifications.

After the MPO has prepared a draft functional classification map, please submit the information to NDDOT for a preliminary review no later than April 1, 2024. NDDOT will review the submittal and provide comments back to the MPO, as necessary. The MPO's submittal must be a cooperative and coordinated effort with its member jurisdictions.

Once all comments have been addressed, the MPO must submit their final functional classification system via electronic copy no later than July 1, 2024. Submittals shall include a letter requesting approval of the functional classification updates, a breakdown of roadway mileage between classes, a map of the updated system and GIS files. All correspondence for submittals may be made to the following:

Sengaroun Marohl
Local Government Division
NDDOT
smarohl@nd.gov
701-328-4448

Please note that unless other arrangements have been made with NDDOT, failure to meet the June 1, 2024 final submittal date will result in NDDOT making functional classification changes on the MPO's behalf.

If you should have any questions during the updating process, please contact Seng or Michael E. Johnson at 701-328-2118.

Thank you for your work in responding to changes necessitated by the 2020 US Census release.

With gratitude,

Paul M. Benning

Paul M. Benning
Local Government Engineer

38/mej

c: Ed Pavlish, Grand Forks District
   Al Grasser, City of Grand Forks
   Erika Shepard, MnDOT

System Mileage by Functional Classification 2024 (miles)

Classification	North Dakota MPA	Percent in ND MPA	Minnesota MPA	Percent in MN MPA	Total MPA	Percent for MPA
Interstate	16.2	4.1%	0.0	0.0%	16.2	3.0%
Principal Arterial	24.3	6.2%	8.2	5.7%	32.5	6.1%
Minor Arterial	31.8	8.1%	15.9	11.1%	47.7	8.9%
Collector/Major Collector	62.9	16.1%	16.1	11.3%	79.0	14.8%
Minor Collector	0.0	0.0%	8.5	6.0%	8.5	1.6%
Local	255.8	65.4%	94.0	65.9%	349.8	65.5%
All Road Total	391.0	100.0%	142.7	100.0%	533.7	100.0%

Note: MPA= Metropolitan Planning Area

From: FHWA Highway Functional Classification Concepts, Criteria, and Procedures 2023 Edition

Classifications in MPO Area	Percent Range*
Interstate	1% - 3%
Other Principal Arterials	4% - 9%
Minor Arterials	7% - 14%
Collector/Major Collector	3% - 16%
Minor Collector	3% - 16%
Local	62% - 74%

* We are using the definition of rural state based on our lead being North Dakota.

Note: The review was based on an urban system for the Grand Forks and East Grand Forks Adjusted Urban Area.

Grand Forks Change in Mileage by Functional Classification

Classification	2021	2024	Change
Interstate	10.0	10.0	0.0
Principal Arterial	21.4	24.9	3.5
Minor Arterial	30.9	32.2	1.3
Collector/Major Collector	39.8	40.9	1.1
Minor Collector	0.0	0.0	0.0
Local	171.0	240.5	69.5
All Road Total	273.1	348.5	75.4

Forks MPO
Functional Classification

Urban vs Rural Before 2020 Census

——	Interstate: Urban
- - -	Interstate: Rural
——	Principal Arterial: Urban
- - -	Principal Arterial: Rural
——	Minor Arterial: Urban
- - -	Minor Arterial: Rural
——	Major Collector: Urban
- - -	Major Collector: Rural
——	Local: Urban
- - -	Local: Rural
▨	Urbanized Area
▨	MPO Planning Area
▨	Water
◯	Areas that need to go from rural to urban
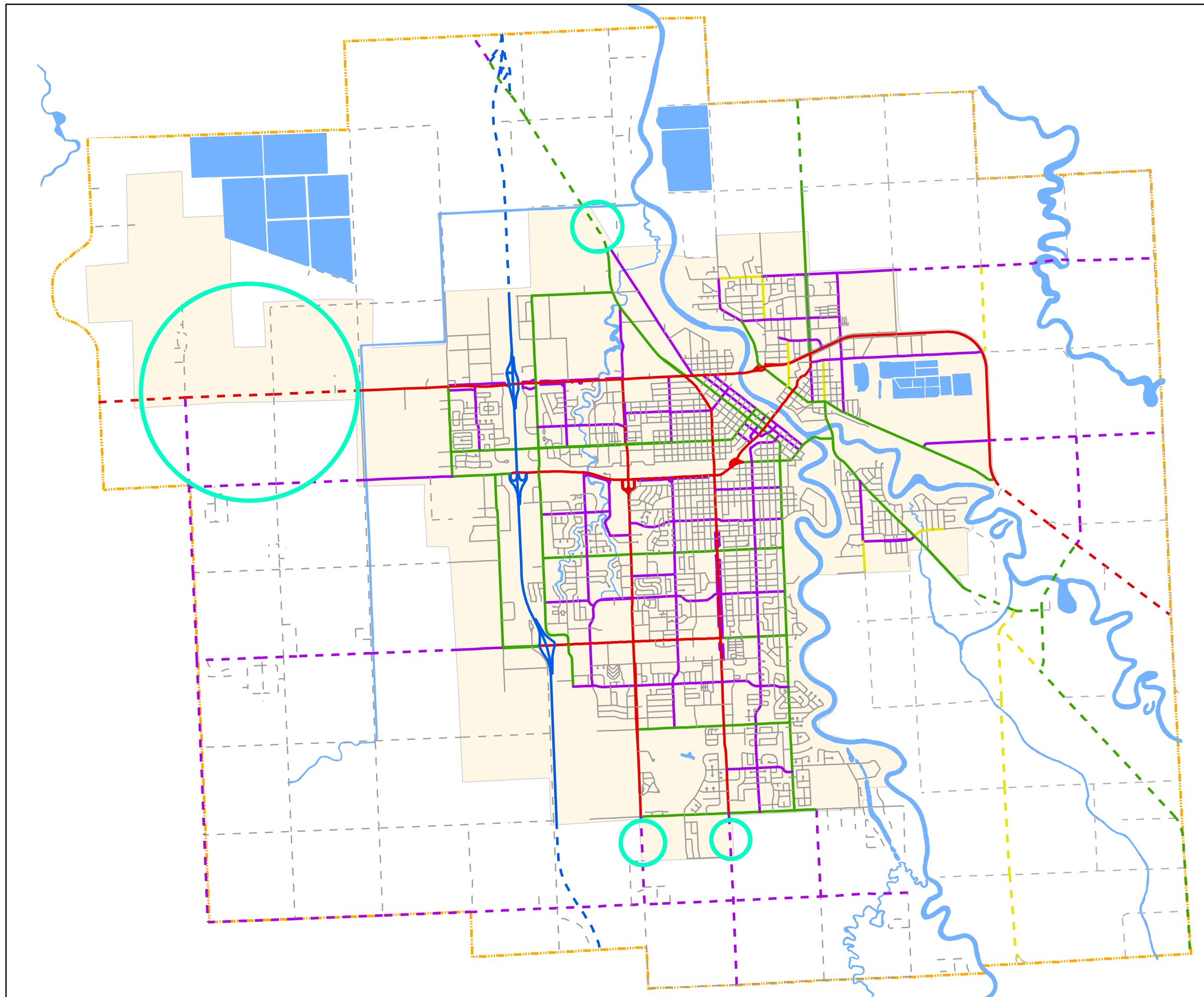
Outline

❖Introduction

❖Objectives

❖PART I - Traffic Data Analysis

❖PART II - Effect of In-crosswalk traffic signs

❖Conclusions and Future Works

Introduction

❖Traffic safety

➢Traffic speed

➢Traffic speed calming techniques

Objectives

❖Evaluate the impact of traffic calming methods,

❖Analyze traffic crash and speeding citation data of Grand Forks,

❖Analyze the effect of YIELD and STOP signs in-crosswalk signs, and

❖Recommend approaches to address traffic safety concerns.

Part I - Traffic Data Analysis

❖ Speeding ticket data analysis

  ➢ Speeding ticket summary
  ➢ Speeding ticket and crash data mapping
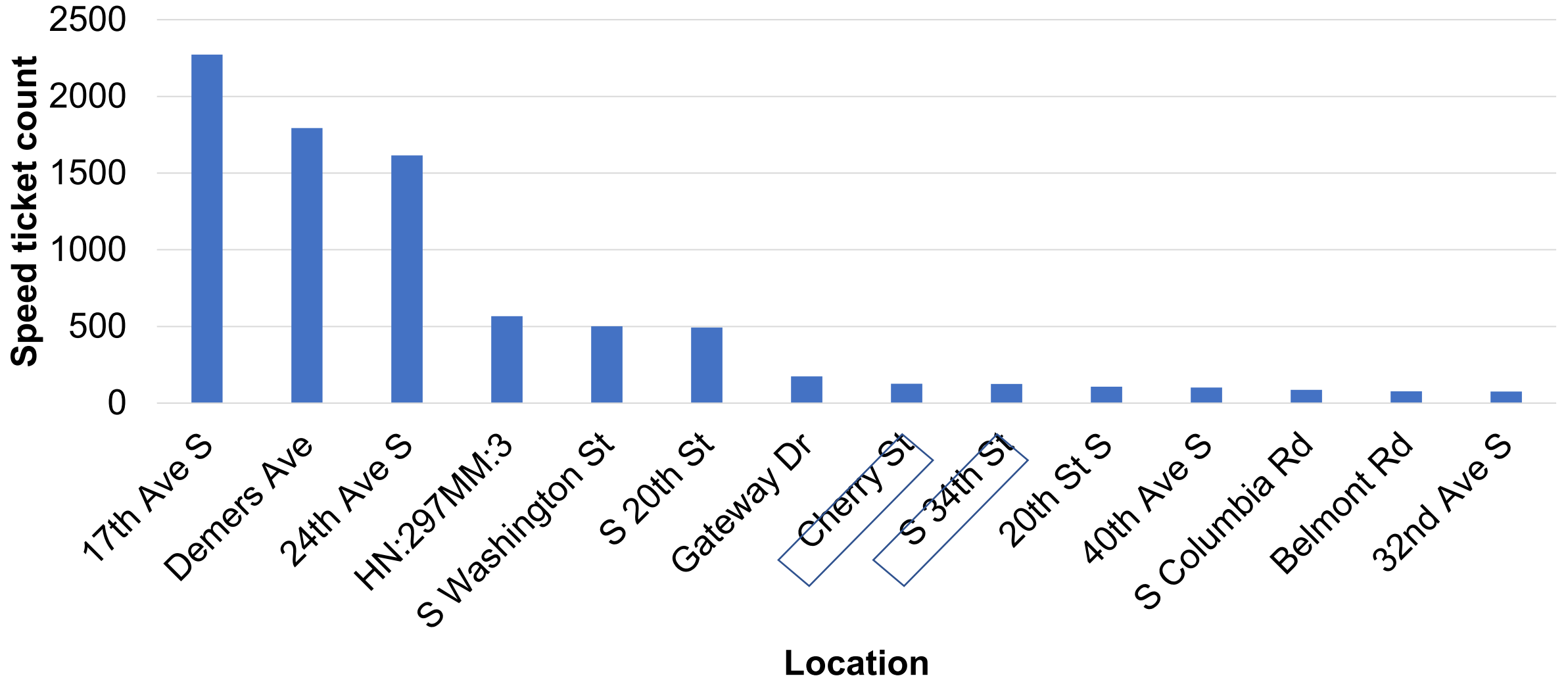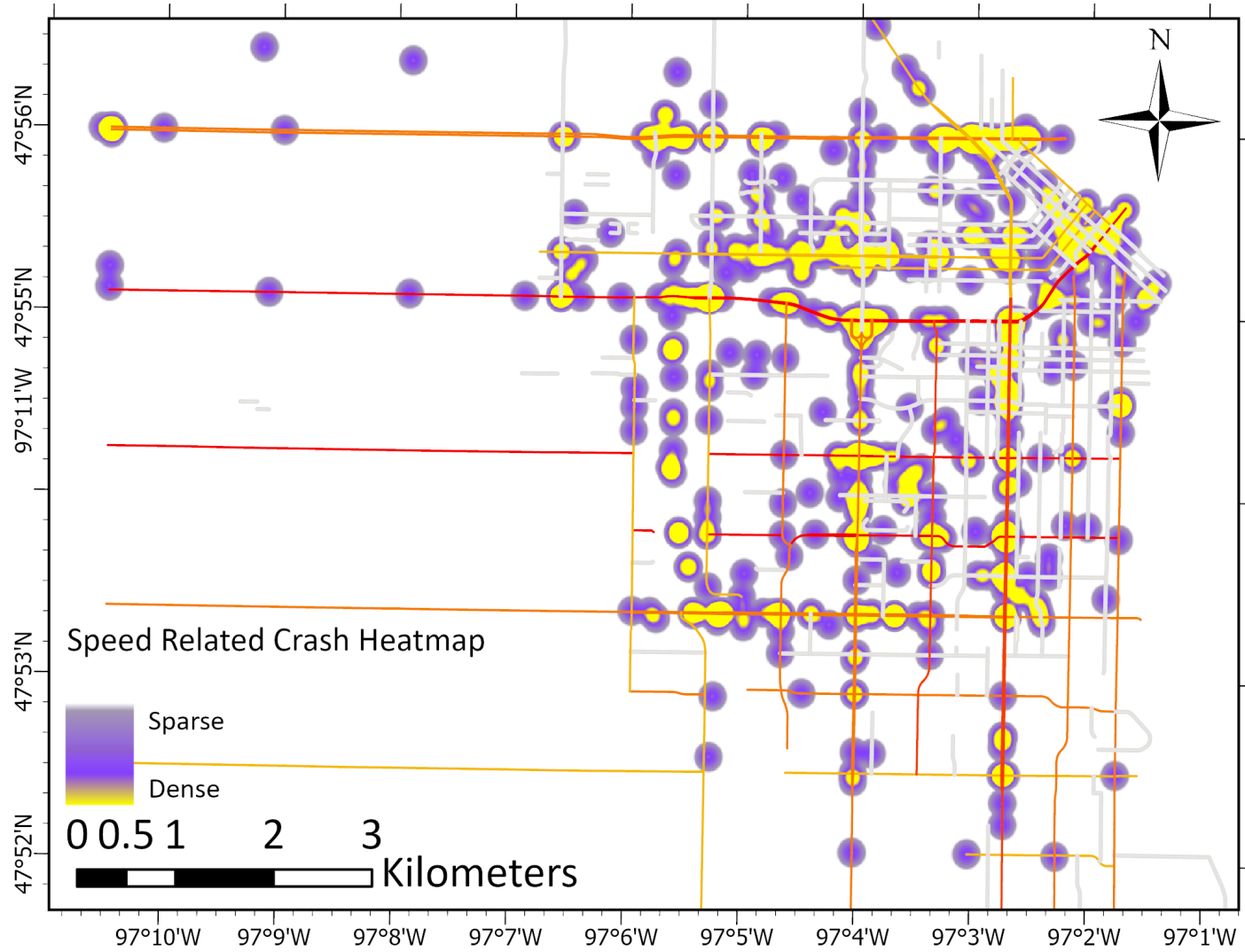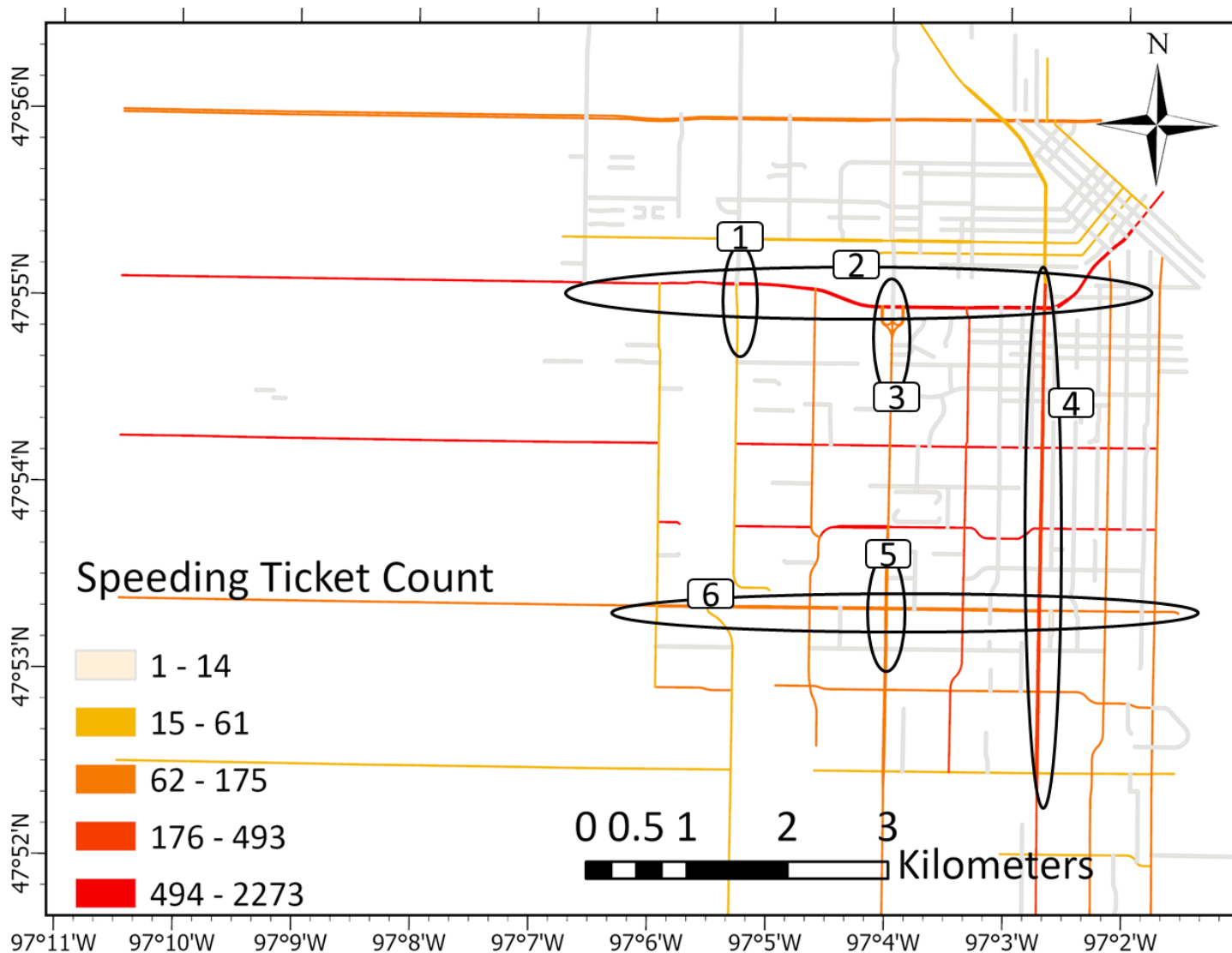
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Speeding Ticket Data

Speed ticket count (y-axis): 0, 500, 1000, 1500, 2000, 2500

Location (x-axis): 17th Ave S, Demers Ave, 24th Ave S, HN:297MM:3, S Washington St, S 20th St, Gateway Dr, Cherry St, S 34th St, 20th St S, 40th Ave S, S Columbia Rd, Belmont Rd, 32nd Ave S

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Speed-Related Crash Heatmap

Speed Related Crash Heatmap

Sparse

Dense

0 0.5 1   2   3
Kilometers

Hotspot Areas

Speeding Ticket Count

- 1 - 14
- 15 - 61
- 62 - 175
- 176 - 493
- 494 - 2273

Id.	Location Name
1	Demers Ave and S 42ND ST Intersn.
2	Demers Ave
3	Demers Ave and S Columbia Rd Intersn.
4	S Washington St
5	32nd Ave S
6	32nd Ave S and S Columbia Rd Intersn.

Part II - Effect of In-crosswalk Traffic Signs
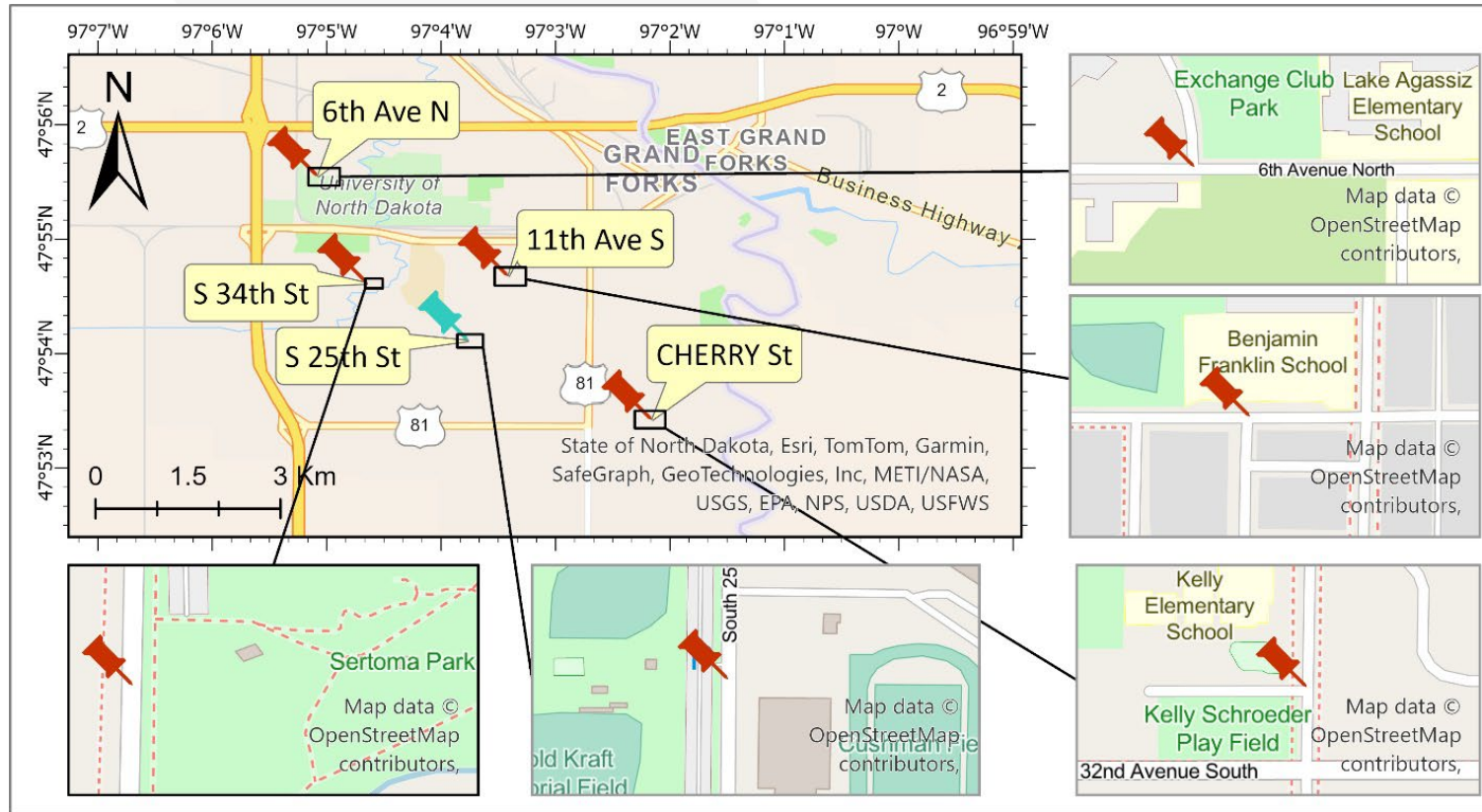
Study area
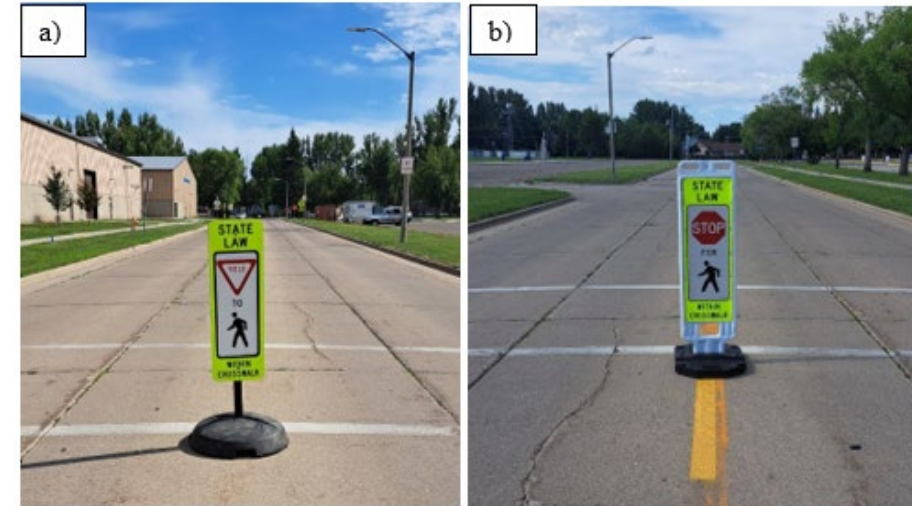
In Crosswalk signs a) YIELD to Pedestrians and b) STOP to Pedestrians at S 25th St (0 ft)

Effect of Signs on Speed When School is not in Session
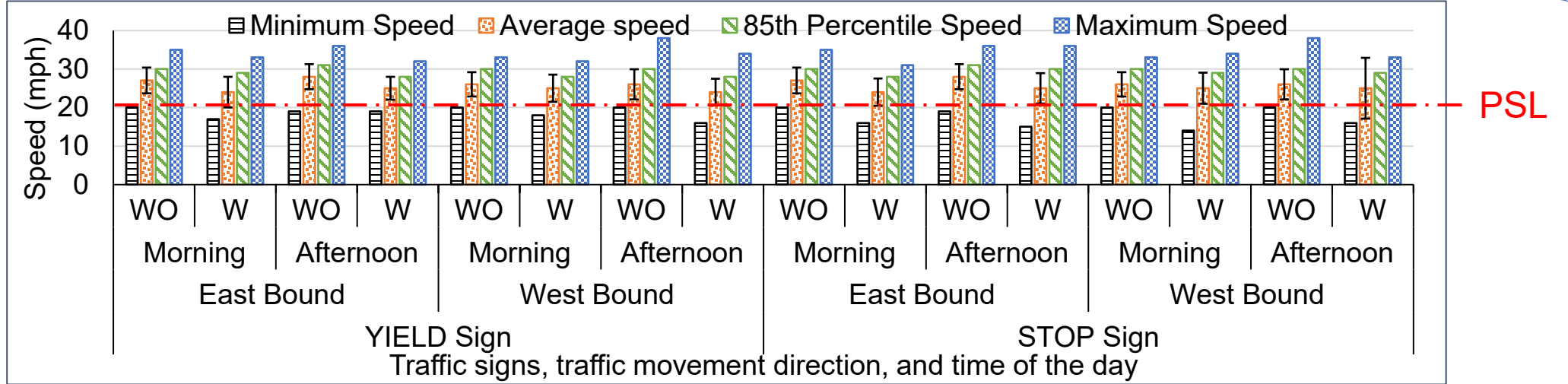
a) 25th Ave S
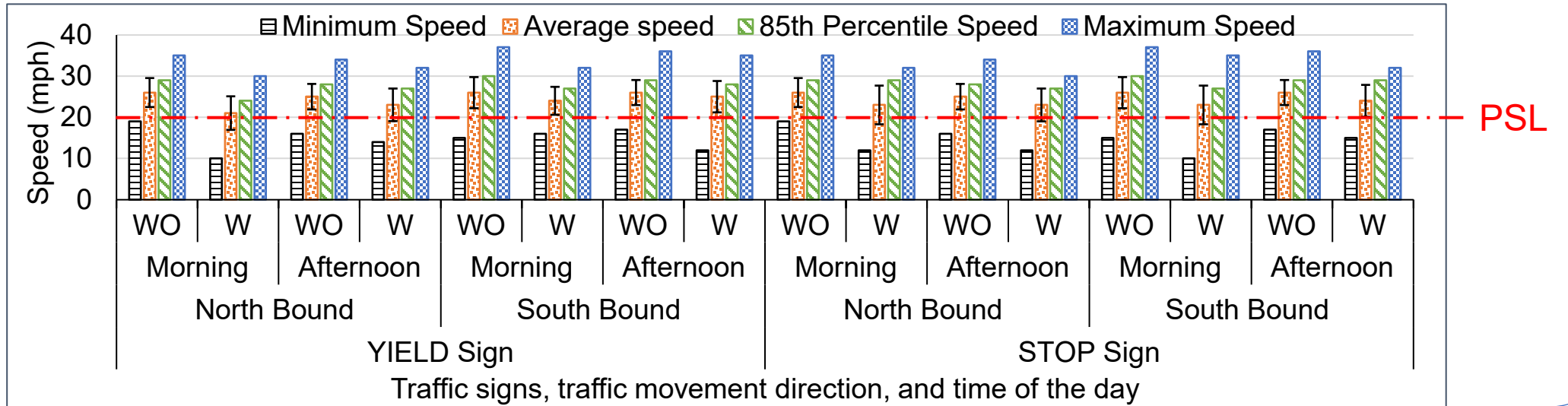
b) Cherry St

Effect of Signs on Speed During School Sessions
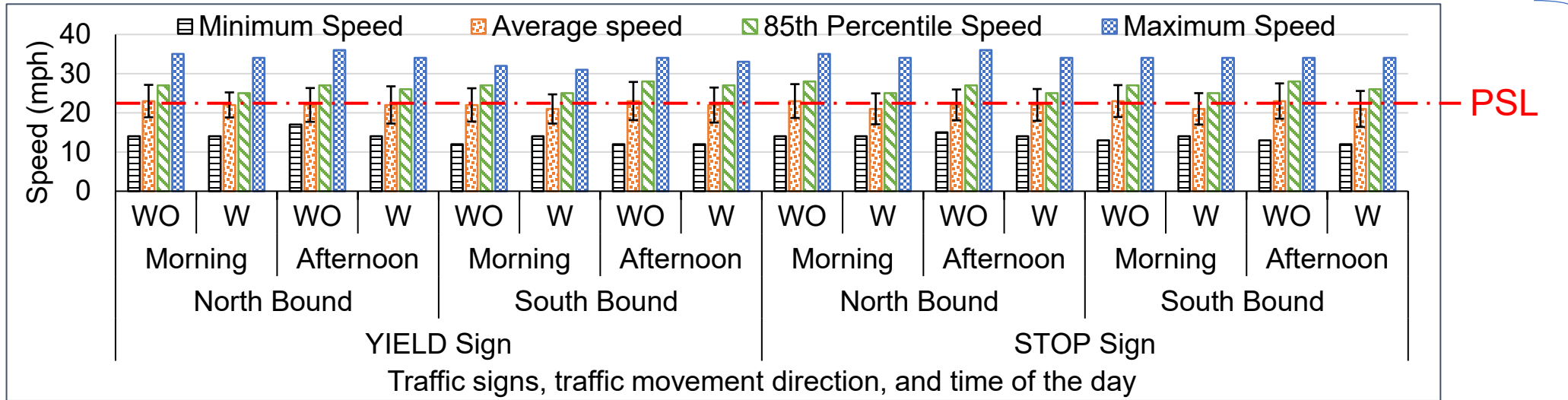
a) 25th Ave S
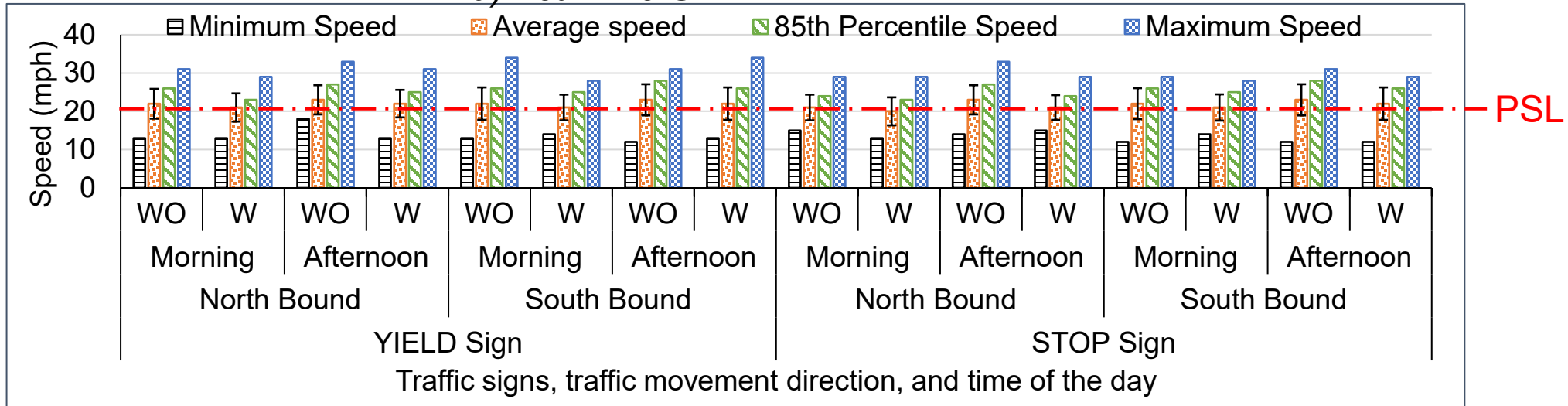
b) Cherry St

Effect of Signs on Yielding for Pedestrians

Street name	Direction	Time of the day	Yielding data (Proportion)		Significance test		Combined
			WO	W	χ2 (p-value)	z-score, (p-value)	
YIELD Sign							
Cherry St	North	M	90 (68.9)	84 (83.8)	4.951 (0.026) S	-2.225 (0.026) S	-2.950 (0.0032) S
		A	83 (71.1)	81 (77.8)	0.964 (0.326) N	-0.982 (0.327) N	
	South	M	80 (68.8)	84 (81.0)	3.254 (0.071) N	-1.804 (0.072) N	
		A	70 (82.9)	76 (86.8)	0.452 (0.501) N	-0.672 (0.503) N	
S 25th St	North	M	73 (74.0)	78 (92.3)	9.176 (0.002) S	-3.029 (0.002) S	-4.804 (<0.00001) S
		A	75 (76.0)	73 (86.3)	2.559 (0.109) N	-1.599 (0.109) N	
	South	M	83 (75.9)	87 (92.0)	8.191 (0.004) S	-2.862 (0.004) S	
		A	80 (73.8)	85 (87.1)	4.669 (0.031) S	-2.161 (0.031) S	
STOP Sign							
Cherry St	North	M	81 (69.1)	78 (89.7)	10.26 (0.001) S	-3.203 (0.001) S	-4.273 (<0.00001) S
		A	74 (73.0)	77 (84.4)	2.958 (0.085) N	-1.720 (0.085) N	
	South	M	70 (72.9)	73 (83.6)	2.412 (0.120) N	-1.553 (0.121) N	
		A	73 (76.7)	75 (89.3)	4.198 (0.041) S	-2.049 (0.040) S	
S 25th St	North	M	79 (74.7)	82 (90.2)	6.781 (0.009) S	-2.604 (0.009) S	-4.761 (<0.00001) S
		A	88 (73.9)	75 (88.0)	5.128 (0.024) S	-2.265 (0.024) S	
	South	M	76 (68.4)	79 (83.5)	4.875 (0.027) S	-2.208 (0.027) S	
		A	79 (69.6)	74 (86.5)	6.289 (0.012) S	-2.508 (0.012) S	

S   Significant at a 0.05 significance level,   N   Not significant at a 0.05 significance level.

Comparison of the Effects of Signs on Traffic Speed

Location	No-school Session				Sig. Diff (95% CI)	In-School Session				Sig. Diff (95% CI)
	YIELD sign		STOP sign			YIELD sign		STOP sign		
	Avg Speed	n	Avg Speed	n		Avg Speed	n	Avg Speed	n	
6th Ave N	24.1	606	23.5	416	0.0017 S	24.2	312	24.1	356	0.6599 N
11th Ave S	24.8	291	24.9	283	0.7064 N	23.0	247	23.2	229	0.5866 N
Cherry St	23.2	331	23.4	287	0.5447 N	21.3	288	21.0	290	0.3122 N
S 25th St	23.1	243	23	216	0.7359 N	21.2	248	21.3	267	0.8949 N
Overall	23.9	1471	23.7	1202	0.3410 N	22.5	1095	22.5	1142	0.8144 N

S   Significant at a 0.05 significance level,   N   Not significant at a 0.05 significance level.

Comparison of the Effect of Signs on Yielding

Location	YIELD	STOP	z-score (p-value)	Combined z-score (p-value)
6th Ave N	255 (85.9)	279 (87.5)	-0.535 (0.596) N	
11th Ave S	227 (92.5)	204 (91.2)	0.506 (0.610) N	-0.497 (0.617) N
Cherry St	325 (82.2)	303 (86.8)	-1.603 (0.110) N	
S 25th St	323 (89.5)	310 (87.1)	1.036 (0.298) N	

S   Significant at a 0.05 significance level,   N   Not significant at a 0.05 significance level.

Conclusions

❖ 17th Ave S, Demers Ave, and 24th Ave S have more speed citation record.

❖ Most of the speed-related crashes occurred near intersections.

❖ Demers Ave, S Washington St, S Columbia Rd, 32nd Ave S, and the intersections of these roads have more frequent speed violations and crashes.

Conclusions *(Continued)*

❖ The presence of in-crosswalk STOP and YIELD signs led to a decrease in both average and 85th percentile speeds.

❖ The presence of the traffic signs significantly improved yielding behavior toward pedestrians.

❖ There was no significant difference between the impact of the two types of traffic signs on speeding and yielding behaviors.
  ➢ Transportation planners have the flexibility to use either sign.

Future Works

❖ Review work and cross-sectional analysis for the application of traffic calming techniques will be done.

❖ Analysis for signal warrants at intersections will be done. The hot spot analysis result will be used as an initial criterion.

Traffic Speed, Traffic Calming Techniques, and Safety Implications for Pedestrians and Bicyclists

Report submitted by: Mulugeta Amare and Daba Gedafa

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ABSTRACT

Transportation involves the movement of road users on a given corridor, and the safety aspect is the primary concern for the transportation system. Previous reports have documented that traffic speeding is a safety concern for pedestrians and bicyclists, contributing to 29 percent of fatalities and 13 percent of injuries. Pedestrian fatalities have increased by 77% over the past decade, constituting a 5% increase in pedestrian fatalities per the overall number of traffic-related fatalities. Identifying hotspot crash locations is the critical parameter for creating an informed safety measure; however, previous studies on traffic safety have primarily focused on using crash frequency as a fundamental parameter. Moreover, studies have investigated the application of different regulatory traffic signs but did not make a significant comparison between different sign types in different areas and time settings. This study presents a review of the safety implications of traffic speed for pedestrians and bicyclists and the traffic speed calming techniques on non-interstate highways. Moreover, the study evaluates the spatiotemporal clustering of traffic crashes using Geographic Information System tools. In addition, a comparative analysis was conducted to evaluate the effectiveness of in-crosswalk traffic signs, such as "YIELD TO PEDESTRIAN" and "STOP FOR PEDESTRIAN," as a potential solution for improving pedestrian safety. The findings from the spatiotemporal analysis revealed that more crashes occurred during winter, and the hotspot identification results from the Getis-Ord (Gi*) and Anselin Local Moran's (I) statistics were compelling. Furthermore, the results from the traffic sign data analysis show that the change in vehicle speed due to both traffic signs was significant in mornings and afternoons, as well as whether or not schools were in session. The yielding to pedestrians was improved in the presence of the traffic signs. However, the difference between the impacts of the two traffic signs on speed and yielding was not significant. Hence, the signs can be used interchangeably.

1. INTRODUCTION

Agencies work closely with law enforcement entities, state traffic safety offices, and the National Highway Traffic Safety Administration (NHTSA) to plan and implement policies that can help reduce the number of crashes to combat high costs, injuries, and deaths. One approach is through the Four Es of traffic safety: Enforcement, Engineering, Education, and Emergency Medical Services. The Four Es play an important role in road safety. Each component is essential and, when taken together as a unified approach, has achieved the lowest crash rates in decades. There were 5.5 million police-reported traffic crashes in 2009. Law enforcement officers work diligently to prevent crashes by enforcing traffic safety laws such as seat belt use, child passenger protection, traveling over the speed limit, impaired driving, and distracted driving. Studies have indicated that increased enforcement and educational campaigns can yield significant changes in driver behavior.

A national awareness campaign called "Click It or Ticket" has increased seatbelt use by as much as 85 percent between 2005 and 2009, saving an estimated 72,000 lives. The NHTSA, state DOTs, law enforcement, and traffic safety offices can prevent crashes by holistically addressing the four components. Technology can also improve how traffic safety advocates, engineers, and other vital

stakeholders use the Four Es. The Four Es approach has contributed to a steady decline in fatality and injury rates over the past few years. The ultimate safety goal is Toward Zero Deaths (TZD) on all highways, a data-driven highway safety strategy focusing on changing driver culture. The TZD initiative relies on data from crashes and police stops, in concert with the four Es, to determine priority areas and make policy and program changes that will reduce the current fatality rate per million vehicle miles traveled (VMT) from 1.14 to zero.

Data used in analysis includes vehicle speed, traffic volume, law-enforcement crash investigation information, emergency medical response information, road sensors, design data, and the effectiveness of public education campaigns. This data can be analyzed holistically to assist decision-makers in creating strategies for comprehensive traffic safety improvement plans. Local, state, and federal agencies host this data in various databases, formats, and types of hardware, creating a challenge when integrating this information to create the holistic view of traffic safety needed to coordinate an approach that prevents crashes. Data analysis enables road designers, law enforcement officers, emergency medical responders, and those designing public education campaigns to identify trends and develop highway safety plans and interventions with the best return on investment.

2. PROBLEM STATEMENT

Safety and traffic concerns arise from increased vehicle traffic, excessive speed, and a disregard for stop signs. The speed of the vehicles is a function of the roadway quality, driver behavior, time of the day, and other roadway elements like traffic signals. United States traffic safety ranks lowest among developed countries (WHO 2021). Speed and careless driving contributed to 34% of North Dakota's fatal crashes in 2021 (NDDOT 2021a). Crashes involving speeding occurred every two and a half hours, and fatalities occurred once, approximately every ten days.

The 2022 North Dakota Department of Transportation (NDDOT) report (NDDOT 2022) reveals that Grand Forks County is ranked second and third in crash rate per million vehicle miles traveled (MVMT) and the number of crashes, respectively. Speeding is a perceived issue in general near the Intersection of Belmont Rd and 55th Ave S in particular. A pedestrian struck by a speeding vehicle in a residential neighborhood with low posted speed limits will have a much higher mortality rate. Suppose a driver increases a speed from 20 mph to 30 mph. In that case, the pedestrian fatality rate may increase by 40%, especially since the driver's ability to stop quickly decreases as their speed increases. That ten mph increase in speed affects a driver's stopping distance by about 85 feet, significantly impacting their ability to stop suddenly, especially under wet, snowy, and icy conditions prevalent in Grand Forks.

Despite all the efforts and measures, crashes still occur at a considerable rate. Identifying the specific locations where a significant number of traffic crashes occur and understanding the underlying causes of these crashes are crucial factors that play a pivotal role in making informed decisions regarding safety measures (Herbel et al. 2009; Varhelyi 2016). The crash frequency has been used as a hotspot screening by agencies. However, crash hotspot analysis should include the effect of traffic volume and crash severity.

Some methods that can increase a driver's adherence to yielding for pedestrians and reduce their traffic speed are the installation of "Stop for Pedestrian" and "Yield to Pedestrians" within crosswalk signs. The Manual on Uniform Traffic Control Devices (MUTCD) by the Federal Highway Administration (FHWA) includes in-roadway "Yield to Pedestrians within Crosswalks" signs that can be placed at uncontrolled marked crosswalks (FHWA 2009). Past studies have also documented the significance of within-crosswalk traffic signs in reducing traffic speed and increasing the drivers' yielding behavior (Ellis et al. 2007; Gedafa et al. 2014; Huang et al. 2000; Pulugurtha et al. 2012). In-roadway signs may be effective since they are directly in the motorist's field of view.

A study on the impacts of alternative yield sign placement on pedestrian safety (Gedafa et al. 2014) determined that placing a yield sign at a crosswalk was the most effective way of increasing the likelihood of a vehicle yielding for pedestrians; however, the authors recommended research on the repeatability of their results at other sites to increase the robustness of their findings. The impact of traffic signs on speeding and yielding may differ based on the type of within-crosswalk sign. A comparison of signage impacts in various time circumstances, as well as during school and non-school sessions, was not investigated.

Therefore, Part 1 of this paper reviews the safety concerns regarding traffic speed and engineering traffic speed-calming techniques, preferred locations, and their effect on pedestrians and bicyclists by reducing traffic speed. Part 2 entails an analysis of traffic crash data along with speed citation data, employing ArcGIS geospatial analysis tools to pinpoint critical areas. Part 3 illustrates the effect of YIELD and STOP in crosswalk signs on vehicle speed and yield to pedestrians.

3. OBJECTIVES OF THE PROJECT
The main objectives of this study include the following:

- Evaluate the impact of traffic calming methods on the reduction of vehicle speed and enhancement of pedestrian and bicyclist safety,
- Analyze traffic crash and speeding citation data of Grand Forks and determine locations that need more detailed studies,
- Analyze the effect of yield and STOP in crosswalk signs on drivers' yielding and speeding behavior and the associated safety implications on pedestrians and bicyclists, and
- Recommend approaches to address traffic safety concerns.

4. LITERATURE REVIEW
Road crashes are a significant global issue, leading to thousands of human fatalities and injuries and incurring substantial resource loss. The growing concern for public safety and transportation network optimization has recently highlighted the need for accurate traffic crash analysis and assessing traffic safety in cold regions, which poses a critical challenge for developing sustainable and resilient infrastructure. The complex interplay of factors, including weather conditions, road maintenance, and driver behavior, significantly impacts transportation system safety (Maze et al.

2006). This section covers a review of traffic hotspot areas analysis, crash factors analysis techniques, and traffic calming techniques.

4.1. Traffic Speed and Safety

Increasing vehicle traffic, excessive speed, and disregard for stop signs pose safety and traffic concerns. According to the World Health Organization's report (WHO 2021), the United States is way behind other developed countries regarding traffic safety concerns. The Road Traffic Death Rate per 100,000 population in the USA is 12.7, more than twice the rate in Canada, which is second place on the list. The 2020 traffic safety fact report from NHTSA shows that 29% of the total 38,824 fatalities and 13% of the total 1,974,002 injuries across the nation were due to speeding. Moreover, speeding-related fatalities have increased by 17% from 2019 to 2020 (NHTSA 2022). Speed and aggressive driving were a factor in 34% of fatal crashes in North Dakota in 2021. In addition, a speed driving-related crash occurred every two and half hours, and fatality occurred once in nearly ten days (NDDOT 2022).

Figure 1 presents the percent contribution of speeding towards fatalities and injuries. For the ten years of data in the USA, the average contribution of speeding is 28% and 15% for fatality and injuries, respectively. Other factors like belt non-use, helmet non-use, distraction, alcohol involvement and causation, and absence of traffic signs and signals account for the remaining percentage.
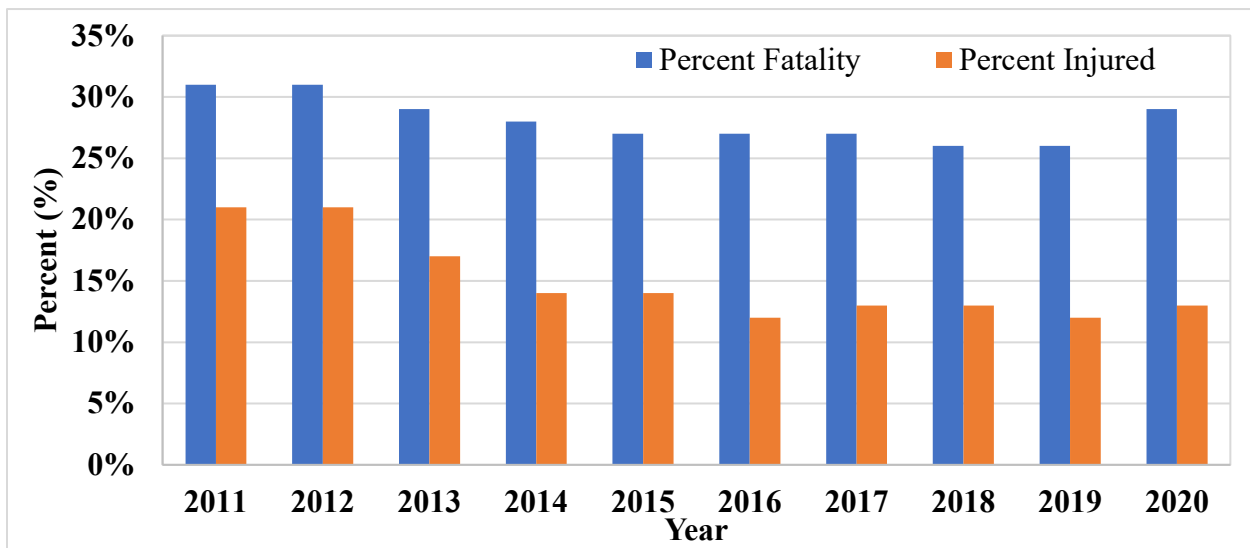

Figure 1 Percent fatality and injury due to traffic speeding, 2020 USA (NHTSA 2022)

In a Crash Summary Report by the North Dakota Department of Transportation (NDDOT), more than 50% of the traffic citations for five consecutive years, 2011-2016, reports were due to speeding. Moreover, in 2021, 27% of the fatalities were due to speeding. Among all the counties in North Dakota, Grand Forks is ranked second and third in crash rate per million vehicle miles traveled (MVMT) and the number of crashes, respectively. In 2021, nearly every six and three days, one bicyclist and one pedestrian were involved in a crash (NDDOT 2022).

The NHTSA fact sheet data (NHTSA 2022) for ten consecutive years, 2011-2020, documented the fatality exposures experienced by five groups of road users. The passenger car occupants are the most affected, followed by light trucks and non-occupants. Figure 2 summarizes the percentage fatality of each passenger type in the USA in 2020. From this, it is evident that at least one out of five persons killed is non-occupant, mainly pedestrians and bicyclists.
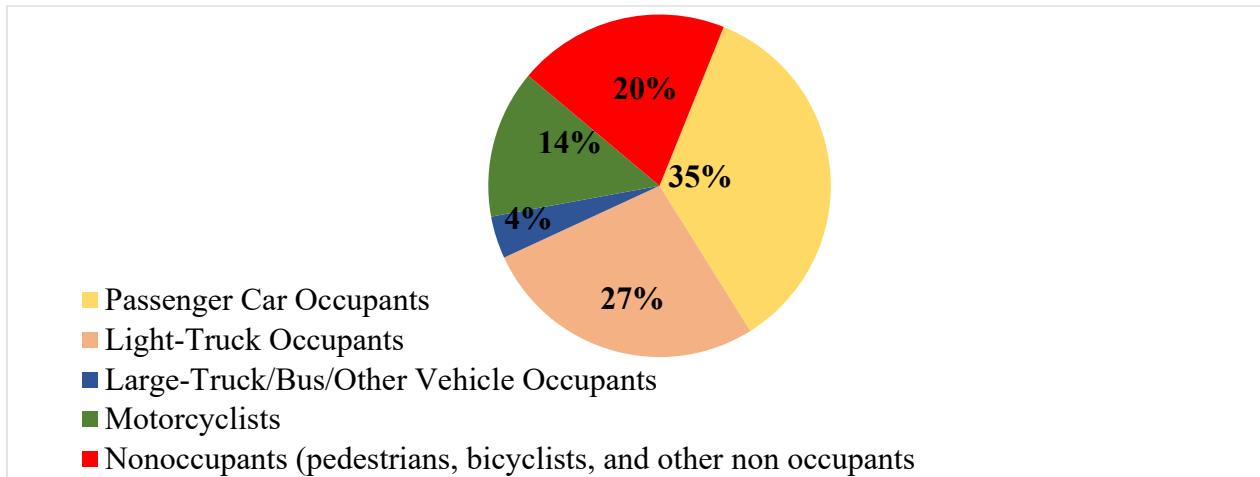

Figure 2 Percentage of traffic fatality per occupant type, 2020 USA (NHTSA 2022)

The relationship between the risk of fatality of a given passenger hit by a vehicle and the speed of the vehicle during collision or impact is calculated using a single logistic regression model, and it is called risk factor (Kong and Yang 2010; Li et al. 2015; Nie et al. 2014; Nie et al. 2010; Tefft 2013). The trend of the fatality curve is similar for all curves, and the risk of pedestrian death looks inevitable for speed values greater than 40mph. Figure 3 summarizes the results of regression models developed by researchers for different countries (considering other parameters like age, impact location, and pedestrian height are constant).

By reducing vehicle speeds and enhancing safety for non-motorized street users, traffic calming can enhance the quality of life for locals living along affected roadways. By improving the safety, mobility, and comfort of non-motorists, traffic calming supports the livability and vitality of residential and commercial districts. These goals are often met by lowering vehicle speeds or densities on a single route or a network of streets. Road-side, vertical, lane-narrowing, and other elements that use self-enforcing physical or psycho-perception mechanisms to achieve desired results are included in traffic-calming measures (FHWA 2017).
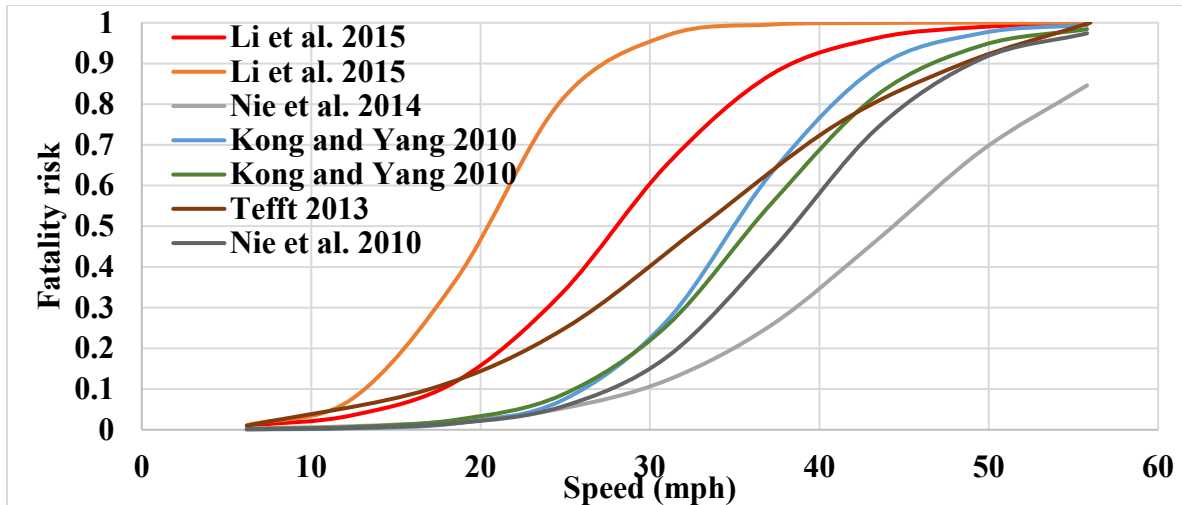
Figure 3 Vehicle speed vs. Fatality risk for pedestrians

4.2. Traffic Hotspot Area and Crash Contributing Factors Analysis

Identifying the specific locations where a significant number of traffic crashes occur and understanding the underlying causes of these crashes are crucial factors that play a pivotal role in making informed decisions regarding safety measures (Herbel et al. 2009; Varhelyi 2016). State-of-the-art Geographic Information System (GIS) tools are instrumental in effectively pinpointing frequently occurring traffic crash locations (Amiri et al. 2021; Audu et al. 2021; Ivajnsic et al. 2021; Lee and Khattak 2019). Additionally, employing advanced Association Rule Mining (ARM) methods can yield valuable perspectives into the multitude of factors and situations statistically associated with these crashes (Das et al. 2019; Yang et al. 2022).

Previous research has investigated the use of GIS-based techniques, including Hotspot Analysis using Getis Ord Gi*, Global Moran's I, Mean Center, Emerging Hotspot Analysis, and Kernel Density Estimation-KDE to discern spatial and temporal crash distribution patterns (Amiri et al. 2021; Le et al. 2020; Mesquitela et al. 2022). These tools can be integrated with road network screening methods, such as Crash Rate (CR) and Equivalent Property Damage Only (EPDO), and increase result accuracy (Le et al. 2020). Researchers have compared GIS tool performance as it relates to identifying hotspot areas (Le et al. 2020; Lee and Khattak 2019; Mafi et al. 2019; Mesquitela et al. 2022). A study comparing five cluster mapping techniques (Amiri et al. 2021) revealed that Moran's I method was the most accurate and precise tool for hotspot identification and clustering pattern identification. Alternative tools, such as KDE and Gi*, are also effective in pinpointing hotspot areas. Integrating weighted crash parameters, such as severity index, using these GIS tools enhances the rationality of hotspot identification (Le et al. 2020).

Creating associations between crashes and contributing factors significantly affects traffic safety analysis. These associations can be revealed using state-of-the-art data analysis approaches such as Association Rule Mining (ARM) (Hossain et al. 2022; Lan et al. 2023; Rahman et al. 2021). Previous studies have explored traffic incident data; however, they could not often establish clear

causal relationships between contributing factors; therefore, identifying root causes remains elusive (Basheer Ahmed et al. 2023; Li et al. 2018; Zaitouny et al. 2022). Previous research has not fully utilized advanced data mining techniques, such as Association Rule Mining (ARM), for comprehensive incident data analysis.

4.3. Effect of Traffic Calming Techniques on Traffic Safety

The Institute of Transportation Engineers defines traffic calming as the combination of measures that reduce the adverse effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users. Traffic calming consists of physical design and other measures put in place on existing roads to reduce vehicle speeds and improve safety for pedestrians and cyclists. For example, vertical deflections (speed humps, speed tables, and raised intersections), horizontal shifts, and roadway narrowing are intended to reduce speed and enhance the street environment for non-motorists. Closures that obstruct traffic movements in one or more directions, such as median barriers, are intended to reduce cut-through traffic. Traffic calming measures can be implemented at an intersection, street, neighborhood, or area-wide level (USDOT 2021).

Table 1 summarizes traffic calming techniques and case study areas registered by FHWA.

Table 1 Summary of traffic-calming countermeasures (FHWA 2017; Johnson 2005; Zegeer et al. 2013)

Calming measures	Purpose	Main Considerations	Case study area
Temporary Installations for Traffic Calming	Change the entire look of a street to send a message to drivers that the road is not for fast driving.	Check for the cost of measures and use them for specific and emergency cases.	Fifth Street Traffic Calming, Tempe, Arizona
Chokers	Designed to slow vehicles at a mid-point along the street through	Ensure that bicyclist safety and mobility are not diminished	Fifth Street Traffic Calming, Tempe, Arizona
Chicanes	Reduce vehicle speeds on local streets and add greener (landscaping).	Reduce on-street parking	Berkshire Street Traffic Calming, Cambridge, Massachusetts
Mini-circles	Reduce speed and manage traffic at intersections where volumes do not warrant a stop sign or a signal.	Use yield, not stop, controls, and do not make generous allowances for motor vehicles.	Seventh Avenue Traffic Calming, Naples, Florida
Speed Humps and Speed Tables	Enhance the pedestrian environment at pedestrian crossings.	It is not recommended in a sharp curve.	Corridor Traffic Calming, Albemarle, Virginia
Gateways	Create an expectation for motorists to drive more slowly and watch for pedestrians entering a commercial, business, or residential district from a higher-speed roadway. They can also create a unique image for an area.	Traffic-slowing effects will depend upon the chosen device and the area's overall traffic-calming plan.	Leland Street Redesign Bethesda, Montgomery County, Maryland
Specific Paving Treatments	Send a visual to motorists about the function of a street and create an aesthetic enhancement of a street. It can be used to delineate separate spaces for pedestrians or bicyclists.	Slippery and bumpy surfaces should be treated.	Downtown Revitalization Partnerships, Clemson, South Carolina
Serpentine Design	Change the entire look of a street to send a message to motorists to drive slowly on this street.	Most cost-effective to build as a new street or where a street will soon undergo significant reconstruction	Old Town Improvements, Eureka, California
Curb Ramps	Provide access to street crossings and improve sidewalk accessibility for people with mobility restrictions.	Consideration of disabled pedestrians	
Speed Cushion	preferred alternative primary emergency response route or on a transit route with frequent service	Cutouts width design	

"Road diets" are one approach to traffic calming. Road diets reduce the width or number of vehicular travel lanes and reallocate that space for other uses such as bicycle lanes, pedestrian crossing islands, left turn lanes, or parking. Safety and operational benefits for vehicles and pedestrians include (USDOT 2021):

- decreasing vehicle travel lanes for pedestrians to cross,
- providing room for a pedestrian crossing median,
- improving safety for bicyclists when bicycle lanes are added,
- providing an opportunity for on-street parking (which also serves as a buffer between pedestrians and vehicles),
- reducing rear-end and side-swipe crashes,
- improving speed limit compliance and
- decreasing crash severity when crashes do occur.

Implementing traffic calming measures can reduce traffic speed, reduce motor-vehicle collisions, and improve safety for pedestrians and cyclists. These measures can also increase pedestrian and bicycling activity (USDOT 2021).

Table 2 summarizes the effect of traffic calming techniques on 85th percentile vehicle speed in different states of Canada and the US. The traffic calming techniques, in most cases, were effective in terms of reducing vehicle speed.

Table 2 Summary traffic calming techniques effect on 85th percentile vehicle speed (FHWA 2014; FHWA 2017)

Traffic Calming Technique	85th %tile Speed (mph)			Study area	No. of site	Location
	Before	After	Change			
Speed Hump	35	27	-8	Various	178	Straight section and pedestrian crossing
	36	31	-5	WA	8	Excessive speeds and cut-through traffic
	37	29	-8	FL	1	In rural residential streets
	28	22	-6	IA	3	At a pedestrian crossing of a rural community street
Speed Table	37	31	-6	Various	72	In straight sections of featured community streets
	38	29	-9	GA	19	At continuous intervals on residential streets
	33	29	-4	IA	1	At a pedestrian crossing of a rural community street
	28	22	-6	IA	3	At a pedestrian crossing of a rural community street
Raised Intersection	37	38	1	Various	2	At entire sections of intersections and junctions
	30	30	0	NY	1	At medium-traffic street intersections
Chicanes	31	22	-9	WA	4	At the community road-side straight section
Center Island	35	33	-2	IA	3	At the intersection and straight section center of main streets
	36	35	-1	IA	2	
Transverse Rumble Strips	55	54	-1	TX	11	Edge of rural roads and at straight sections near intersections and curves
	49	52	3	KY	3	Horizontally curved rural roads
Converging Chevrons	53	52	-1	TX	-	At the freeway-to-freeway connector ramp
	53	53	0	TX	-	
	37	33	-4	OH	1	At intersection and curve approaches
Speed Activated Speed Limit Sign	36	30	-6	CO	1	In streets near schools and restricted speed zones
	39	34	-5	CO	2	
	37	33	-4	CO	3	
	37	32	-4	CO	1	
Speed Feedback Sign with Action Message	65	63	-2	TX	1	
	59	52	-7	IA	1	
	34	32	-4	WA	9	At curved road sections
	33	31	-5	WA	3	
	36	31	1	WA	1	

With a significant contribution from the SRC, West Fargo's project team developed a list of traffic-calming solutions that can be implemented (METROCOG 2021). Some criteria used to come up with the list were feasibility, effectiveness, maintenance, and other measures such as emergency services or vehicular impacts. The list includes lane narrowing, curb extension, pinch-point, chicane, median island, mini roundabout, speed hump, pavement material, diverter, and landscaping.

4.4. Effects of YIELD and STOP Signs on Pedestrian Safety and Traffic Speed

Engineers have traditionally marked crosswalks for three reasons: to increase pedestrian safety by identifying the safest location to cross the street, to alert drivers to the possibility of pedestrians crossing at that location, and to increase a pedestrian's level of service and safety (Van Houten et al. 2002). Crosswalk markings and their correlation to increased pedestrian safety have been the subject of much debate. A study on the safety effects of marked versus unmarked crosswalks at uncontrolled locations (Zegeer et al. 2001) compared 1,000 marked and 1,000 unmarked crosswalks in 30 USS cities. Their study indicated only one instance where there was a significant difference in the number of crashes between marked and unmarked crosswalks: crosswalks on multilane roads with an uncontrolled approach had significantly more crashes than unmarked crosswalks if the road had average annual daily traffic (AADT) above 12,000. The study also indicated that more than 70% of pedestrians cross at marked locations, most notably those younger than 12 and more than 64 years old. Research indicates that marked crosswalks can lead to a false sense of security; however, behavioral data collected from multiple sites before and after crosswalks were installed contradicted this hypothesis. This data indicated that marked crosswalks were associated with higher pedestrian-observing behavior and lower driver speeds (Knoblauch et al. 1999).

Several studies have demonstrated that "YIELD to Pedestrian" signs placed in roadways can increase the percentage of motorists yielding for pedestrians (Ellis et al. 2007; FHWA 2009; Huang et al. 2000; Kannel et al. 2003; Strong and Ye 2010). In-roadway signs were also evaluated in other studies (Turner et al. 2006). The research team collected data on motorist yielding behavior at 42 crosswalks in different regions of the United States. The results indicated that the in-roadway signs were associated with yielding rates of 87% for two-lane roads and were highly cost-effective in increasing yielding behavior. Gedafa et al. (2014) also determined that yield signs installed at any location result in vehicles yielding to pedestrians. The placement of the sign at a crosswalk is the most effective method for increased yielding, and the presence of a yield sign results in a lower average traffic speed. These findings imply that the risk to pedestrians and bicyclists is lower in the presence of the sign. These studies need to be validated with additional studies at different locations.

Research conducted in Iowa analyzed the effects before and after implementing the State Law – Yield to Pedestrians at three locations and concluded that the sign positively affected driver behavior (Kannel et al. 2003). An observational study focused on the spillover effects of within-crosswalk signs reported that the signs positively impact and enhance motorist and pedestrian

behaviors (Strong and Ye 2010). Another study comparing the single and gateway configurations of in-crosswalk signs discovered that all setups effectively increased the yielding percentage (Bennett et al. 2014).

Pedestrian's right of way in crosswalk includes driver and pedestrian responsibilities according to North Dakota Century code: when traffic-control signals are not in place or not in operation, the driver of a vehicle shall yield the right of way, slow down or stop if need be to yield so, to a pedestrian crossing the roadway within a crosswalk when the pedestrian is upon the half of the roadway upon which the vehicle is traveling, or when the pedestrian is approaching so closely from the opposite half of the roadway as to be in danger; and no pedestrian may suddenly leave a curb or other place of safety and walk or run into the path of a vehicle which is so close as to constitute an immediate hazard.

5. MATERIALS AND METHODS

5.1. Study Area and Materials

The Grand Forks city, which had an estimated population of 58,692 in 2022, is located in the Great Plains region; therefore, there are notable climate variations between the summer and winter seasons, with the lowest temperatures typically recorded in winter months, such as January, February, and December, and occasional snowfall extending into April (Bangsund et al. 2022; NOAA 2022).

I)   Traffic Hotspot Area and Crash Contributing Factors Analysis

The hotspot analysis focused on traffic crashes in the city of Grand Forks, North Dakota, USA, from 2017 to 2022. Crash hotspot analysis requires a minimum of three to five years of data (Cheng and Washington 2005; FHWA 2011). This study used six years of data from the Grand Forks City Police Department, including 2,048 police-reported crashes. All traffic crashes were used for the crash hotspot analysis. The study used street centerline data and AADT generated from the Grand Forks Data Hub website. Figure 4 illustrates the study area and crash data map. All crash points were geocoded on the road networks using ArcGIS Pro version 3.1.2.
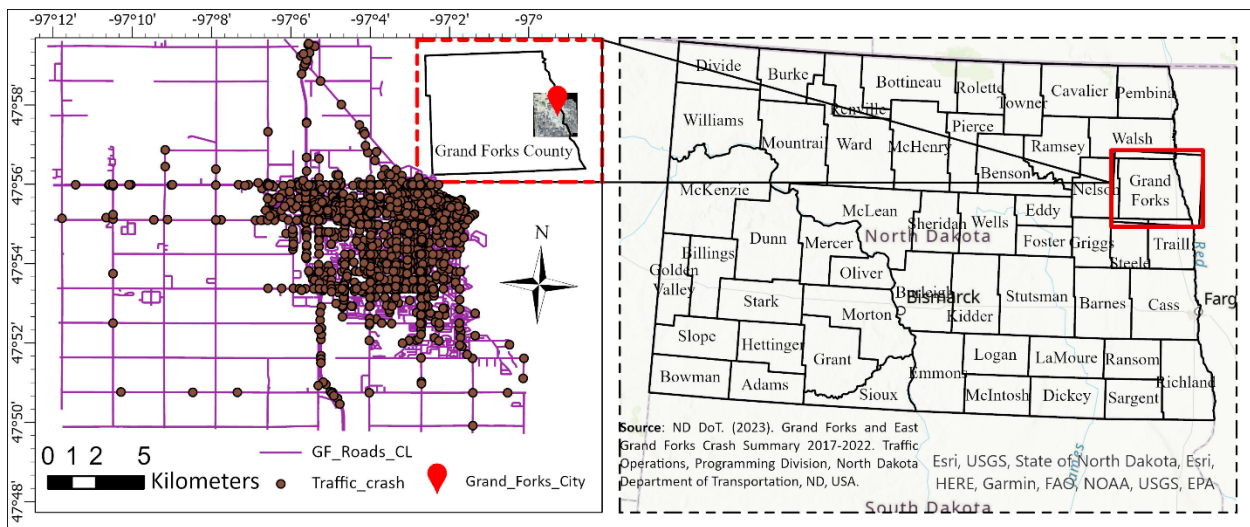

Figure 4 Crash map of Grand Forks city

II)   Effect of In-Crosswalk Traffic Signs on Pedestrian Safety

The traffic speed and yield data were collected at five locations in Grand Forks, North Dakota, USA. The main facilities in the city include business areas, residence areas, schools, and recreational parks. The city streets that are close to the recreational parks and schools experience more pedestrians and bicyclists; therefore, those regions were selected for data collection. The streets selected for the study were 6th Ave N, S 25th St, Cherry St, 11 Ave S, and S 34th St. Figure 5 indicates the location of the study areas selected for speed and yield data collection.
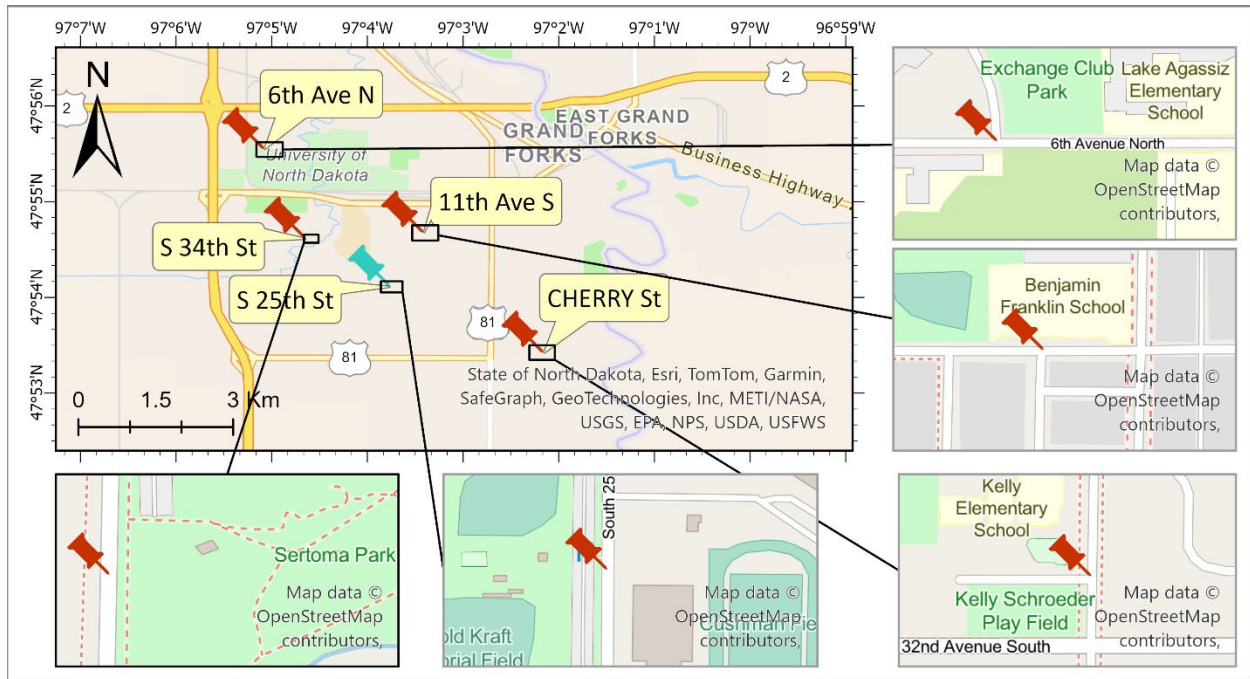
Figure 5 Study area for in-crosswalk signs

The speed data were collected during in-school hours and times when schools were not in session at all locations; however, the yield data were collected at all locations for the in-school sessions only. Table 3 summarizes the main features and collected data types at each location.

Table 3 Study location features (NDDOT 2021)

Location	Number of Lanes	AADT (2020)	Posted Speed Limit (mph)	Collected Data			
				Speed		Yield	
				School	No-School	School	No-School
6th Ave N	Two-lane with turning-lane	3908	25	*	*	*	
11th Ave S	Two lane	2320	20	*	*	*	
Cherry St	Two lane	3065	20	*	*	*	
S 25th St	Two lane	1550	20	*	*	*	
S 34th St	Two lane	3160	30		*		

5.2. Methods

This study used various GIS analysis tools to analyze traffic crash hotspot locations and their temporal patterns. The analysis consisted of two parts: a) a spatiotemporal analysis using Emerging Hotspot Analysis and b) a hotspot spatial analysis using Anselin Local Moran's I and Getis-Ord Gi*.

Crash frequency has been used in the past to identify areas with significant safety concerns (Abdulhafedh 2016; Lord and Mannering 2010); however, safety analyses using crash frequencies

are biased toward higher traffic volume areas and do not take the effect of traffic volume and crash severity into account. Equivalent Property Damage Only (EPDO) and Crash Rate (CR) values were calculated to factor in the effect of severity and traffic volume, respectively.

The EPDO technique applies a weighting factor and converts the fatality and injury severity levels to an equivalent Property Damage Only-PDO level (Bonneson 2010; Wemple et al. 2014). The weighting factors related to the societal costs for each severity level could be variable for different regions. The study used the NDDOT's KABCO injury classification and weighting factors of 100, 55, 17, 11, and 1 for fatal, incapacitating, non-incapacitating, possible, and PDO injury levels, respectively (NDDOT 2021b). Equation 1 is used to calculate the EPDO Weighted total.

$$EPDO\ Weighted\ Total\ = 100K\ +\ 55A\ +\ 17B\ +\ 11C\ +\ O \tag{1}$$

Where K, A, B, C, and O represent fatal, incapacitating, non-incapacitating, possible, and PDO injury, respectively.

Crash rate (Equation 2) was used to identify hotspot areas and consider the effects of traffic volume and vehicle miles traveled. The CR considers traffic and road network parameters, such as Million Vehicle Miles Travelled (MVMT), road length, and AADT (NDDOT 2021b; Wemple et al. 2014).

$$Crash\ Rate, CR\ =\ \frac{n\ *\ 1,000,000}{AADT\ *\ 365\ *\ t\ *l} \tag{2}$$

Where n is the number of crashes per street, AADT is the average annual daily traffic, t is years, and l is road length in miles.

Hotspot Spatial Analysis

Crash hotspot analysis can be performed using either the original crash point data or data that has been integrated into the road network (Le et al. 2020; Mafi et al. 2019; Mesquitela et al. 2022). It is advisable to assess the data's global spatial pattern before conducting any local spatial analysis (Mesquitela et al. 2022). The Global Moran's I-statistic was used to determine if the crashes exhibited clustering, dispersion, or random distribution. This statistic ranges from -1 to 1, where values near -1, 0, and 1 indicate random dispersion, complete geographic randomness, and clustered patterns, respectively. The I statistic calculates a Z-score, which is a standard deviation that measures statistical significance and checks spatial relation (ESRI 2019). An 800-meter bandwidth was selected after several trials since it yielded the highest Z-score.

The Gi* tool calculates a statistic that yields high and low spatial point clusters (ESRI 2019). This study calculated Gi * statistics for the road network. The areas with statistically high and low feature attributes were identified. Each feature's Z-score is the dataset's Gi* statistic. The hotspot intensity, a cluster of high values, is proportional to the Z-score value for positively significant statistical data. A near-zero Z-score implies no spatial clustering. A significance level of α=0.05 was considered. The Gi* statistic is computed as:

$$G_i^* = \frac{\left(\sum_{j=1}^{n} W_{i,j} X_j - \left(\frac{\sum_{j=1}^{n} X_j}{n}\right) \sum_{j=1}^{n} W_{i,j}\right)}{\sqrt{\frac{\sum_{j=1}^{n} X_j^2}{n} - (\bar{X})^2} * \sqrt{\left(\frac{n * \sum_{j=1}^{n} W_{i,j}^2 - \left(\sum_{j=1}^{n} W_{i,j}\right)^2}{n-1}\right)}} \tag{3}$$

Where Xj is the attribute value for feature j, Wi,j is the spatial weight between i and j, and n is the number of features.

The I-statistic (Equation 4) identifies clustered and outlier data points at a confidence level of 95%. The Anselin Local Moran's I tool was used to identify high and low clusters and outliers. The outliers are locations of statistically significant points with high values surrounded by low-value segments, or vice versa (Anselin 1995; ESRI 2019). A positive I value implies a clustered feature with similarly high or low neighboring attribute values; however, a negative I value indicates an outlier. The results could be clusters of high values - HH, low values - LL, outliers of high values surrounded by low values – HL, or low values surrounded by high values - LH (ESRI 2019).

$$I_i = \frac{(x_i - \bar{X}) * \sum_{j=1, j \neq i}^{n} w_{i,j}(x_i - \bar{X})}{\sum_{j=1, j \neq i}^{n} \frac{(x_i - \bar{X})^2}{n-1}} \tag{4}$$

Where x_i is a feature of the i attribute, $\bar{X}$ is the corresponding attribute mean, $w_{i,j}$ is the spatial weight between i and j, and n is the total feature number.

Spatiotemporal Analysis
The Emerging Hotspot Analysis is a location and time pattern tool used to identify the space-time clustering of points using other tools, such as the Create Space Time Cube By Aggregating Points from Defined Locations and Multidimensional Raster Layer tools (ESRI 2019). This study used the Aggregating Points tool as a preliminary step before conducting the Emerging Hotspot Analysis. The crash data was incorporated, and the study area, situated in the northern hemisphere, was subdivided into the four primary seasons: winter, spring, summer, and autumn (Trenberth 1983).

Association Rule Mining (ARM)
Association rule mining is a powerful method used to uncover interesting relationships between variables within extensive datasets. Association Rule Mining (ARM) facilitates the extraction of insights regarding the causes, consequences, and likelihood of various outcomes. This technique is distinctive due to its simplicity, making it straightforward to implement and understand; however, it has a significant disadvantage when managing complex datasets with many variables since it can generate irrelevant rules. This study extracted patterns with high frequency and confidence values to address this issue.

Apriori Algorithm

There are several ARM algorithms, such as Apriori, LP-growth, eclat, and FP-Growth (Chee et al. 2019); however, this study used the Apriori algorithm due to its advantages of shorter mining times and lower memory consumption when mining frequent item sets. The algorithm uses three key metrics, support, confidence, and lift, to select interesting rules from many potential rule sets. Support is the number of times that item sets co-exist (Equation 5).

$$Support\ (A \rightarrow B) = P(A \cap B) = \frac{N(A \cap B)}{N(ALL)} \tag{5}$$

Where A is a factor, B represents a consequence, $N(A \cap B)$ represents the frequency of occurrence of A and B together, and N(ALL) is the total frequency of all incidents.

Confidence is a conditional probability, which refers to the probability of B occurring if B has already occurred (Equation 6).

$$Confidence\ (A \rightarrow B) = P\left(\frac{B}{A}\right) = \frac{P(A \cap B)}{P(A)} \tag{6}$$

Where $P(B/A)$ is the probability of effect B occurring given that factors A have occurred, $P(A \cap B)$ is the probability of two events co-occurring, and P(A) is the probability of A occurring.

Lift quantifies how much more likely it is for the items to occur together than if they were independent (Equation 7).

$$Lift\ (A \rightarrow B) = \frac{Support(A \rightarrow B)}{\left(Support(A) * Support(B)\right)} \tag{7}$$

Where Support(A→B) is the support of the rule A → B (the co-occurrence of items A and B), and Support(A) and Support(B) are the individual supports of items A and B, respectively.

Figure 6 illustrates the approach used to extract association patterns between cause factors and their impacts from crash data through association rule mining. Crash reports were initially gathered, and variables were categorized into distinct subgroups. Association rules were then applied to identify the relationships between these factors and their effects. Strong association rules were subsequently extracted and subject to discussion.
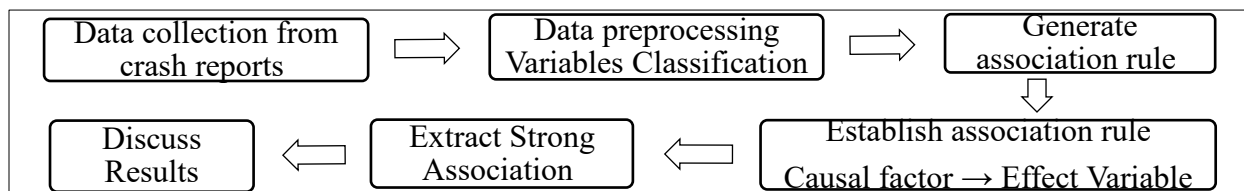

Figure 6 Framework for extracting the cause and effect of a traffic crash

Speed and Yield Data Analysis

The regulatory in-street traffic signs described in Section 2B.12 of the FHWA Manual on Uniform Traffic Control Devices (FHWA 2009) were used. Figure 7 presents the two traffic signs placed at the edge of the crosswalk lines at 25th Ave S. Vehicle speed data were collected using a Scout Wireless Handheld Traffic Radar Gun by Decatur.

The speed and yield data were collected at the test streets with (W) and without (WO), the two within-crosswalk traffic signs. The data were collected twice a day from May 2023 to October 2023, during the morning (M) and afternoon (A) hours at 20-minute intervals. The speed and yield data were collected at free-flow traffic conditions and peak-hour conditions, respectively. These free-flow conditions are usually observed during off-peak hours (Manual 2000). The traffic signs were placed at the most effective location: the intersection of the road center line and crosswalk line (Ellis et al. 2007; Gedafa et al. 2014).

The minimum, average, 85th percentile, and maximum speeds were calculated. The 85th percentile speed is a fundamental element in setting speed limits (Forbes et al. 2012). The speed for turning vehicles was excluded from the analysis since the drivers reduced speed even without the presence of the traffic signs. The yield data were collected at peak hours and only during school sessions. The drivers were scored according to how they interacted with the pedestrians.

The leading vehicle's speed and yield score were considered when vehicles traveled closely. The stopping sight distance (SSD) determined vehicle proximity, and roads were marked at this distance from the pedestrian crossing line. The SSD was calculated based on posted speed limits at each site and consisted of brake reaction distance and braking distance (AASHTO 2011). Vehicles following another within a distance shorter than the SSD were excluded from the analysis. Drivers received a yielding score if they stopped or yielded for pedestrians. Drivers also received a yielding score if pedestrians appeared after drivers passed the SSD mark. A driver was marked as not yielding if the pedestrian reached the road crossing before the driver reached the SSD mark and did not yield. Any conflict between a driver and a pedestrian was considered as not yielding.
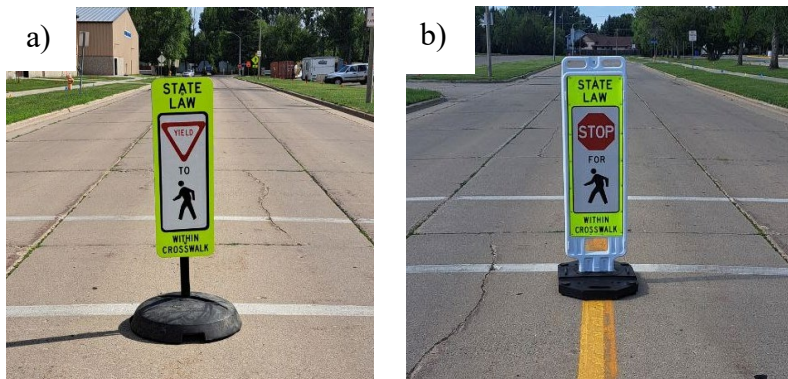

Figure 7 Within-crosswalk traffic signs at S 25th St: a) YIELD to Pedestrians: R1-6 and b) STOP to Pedestrians: R1-6a

Significance Difference Tests

Statistical tests were used to check the significant difference between the with and without traffic sign yield and speed data. A 95% confidence level was used for all statistical tests. An independent t-test was used to test for the significant difference between the average speeds with and without traffic signs. This test can be used to make inferences about two independent means (Ott and Longnecker 2015). The null hypothesis for the t-test stated that the means of the two samples were not significantly different and could be rejected when the p-value was less than the selected significance level (Mendenhall et al. 2012).

Chi-squared and two-proportion tests were used to check the yielding proportion difference between the with and without conditions. The tests were used to test the significant difference between two categorical variable proportions, and the null hypothesis for these tests stated that there was no significant difference between the two sample proportions (Mendenhall et al. 2012; Ott and Longnecker 2015). Figure 8 summarizes the main steps followed while conducting this study.
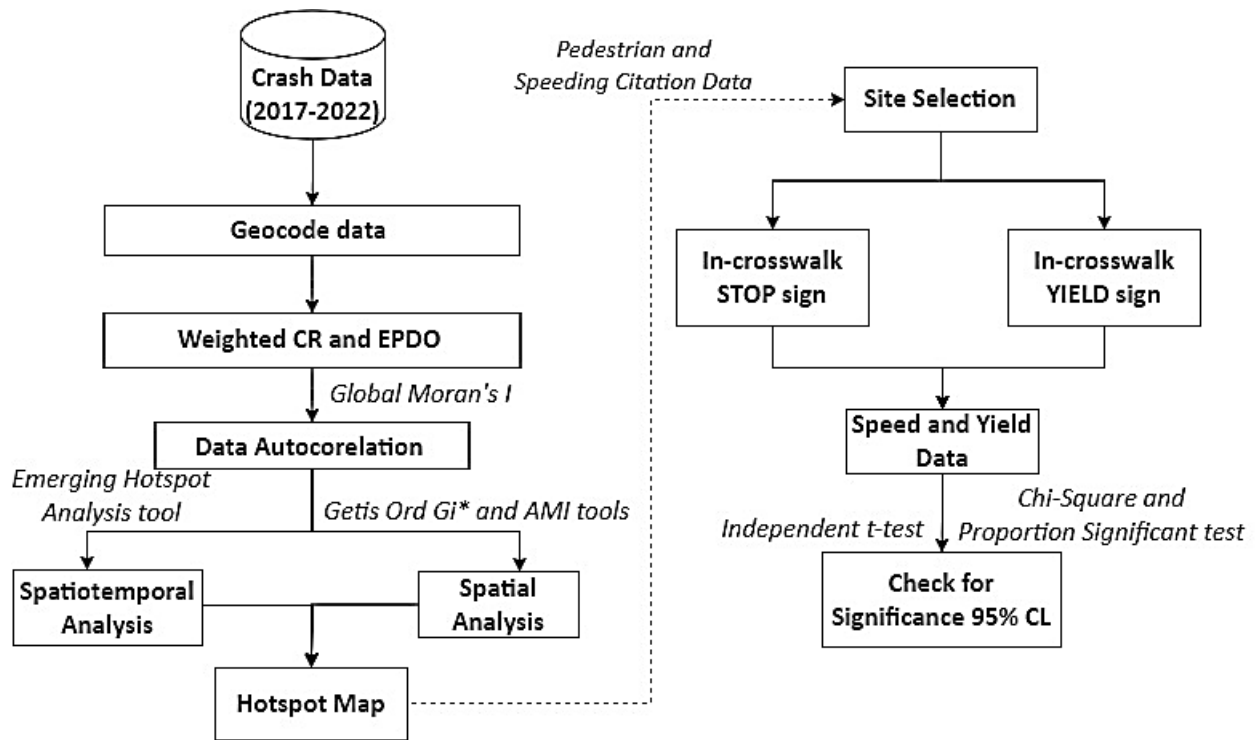

Figure 8 Study flowchart

6. RESULTS AND DISCUSSIONS

6.1. Preliminary Analysis

Different crash pattern summaries were done before the hotspot area analysis. There were more than 22 factors reported as a cause for each crash. Figure 9 presents the total number of crashes caused by each contributing factor except the unknown factors. The reasons for 797 crashes were reported as unknown. The major contributing factors for the crashes were Failure to Yield (16%), Too Fast for Conditions (16%), Following Too Close (15%), Careless Driving (12%), and Weather (11%). The crashes due to animals in the roadway and disregarding road markings were one. According to the NDDOT vision zero initiative definition, speeding includes driving too fast for the conditions, following too close, and recklessly operating a vehicle. Hence, speed-related factors accounted for 45% of the crashes with known causes and 28% of the total reported crashes with known and unknown reasons.
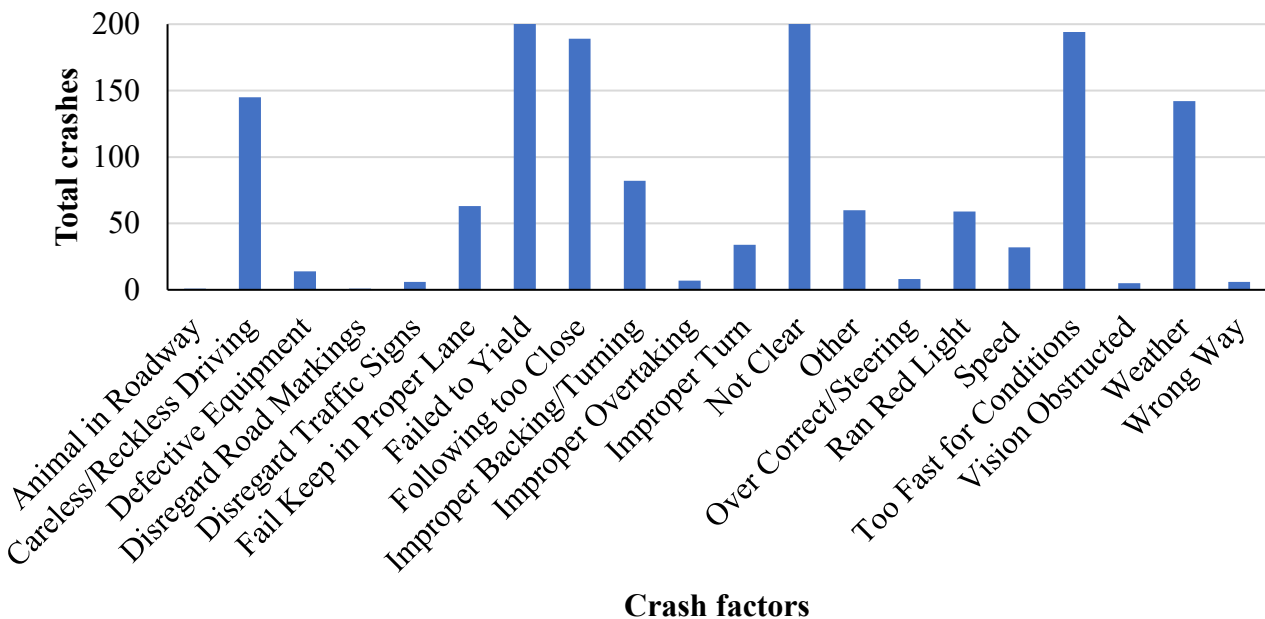
Figure 9 Crash contributing factors and percent total crash

Alcohol use increases the possibility of a crash and severity (Beaulieu et al. 2022). Figure 10 presents the number of crashes for the corresponding alcohol use and severity level conditions. Only 5% of the total crashes involved alcohol. The severity level data shows 81% of the crashes were property damage only (PDO), 10% were non-incapacitating injuries, 8% were possible injuries, and 2% were fatal and incapacitating injuries. Most of the fatal crashes involve drivers with no alcohol use. For all severity cases, the number of crashes due to alcohol use is less than no alcohol use. The higher alcohol use rate was seen for incapacitating injuries, where crashes due to alcohol use accounted for 19% of the total incapacitating injuries.

Figure 10 Percent crash severity levels due to alcohol use

The safety equipment (seat belts and helmets) that the drivers or passengers used during the crashes could significantly affect the severity level (Egly and Ricca 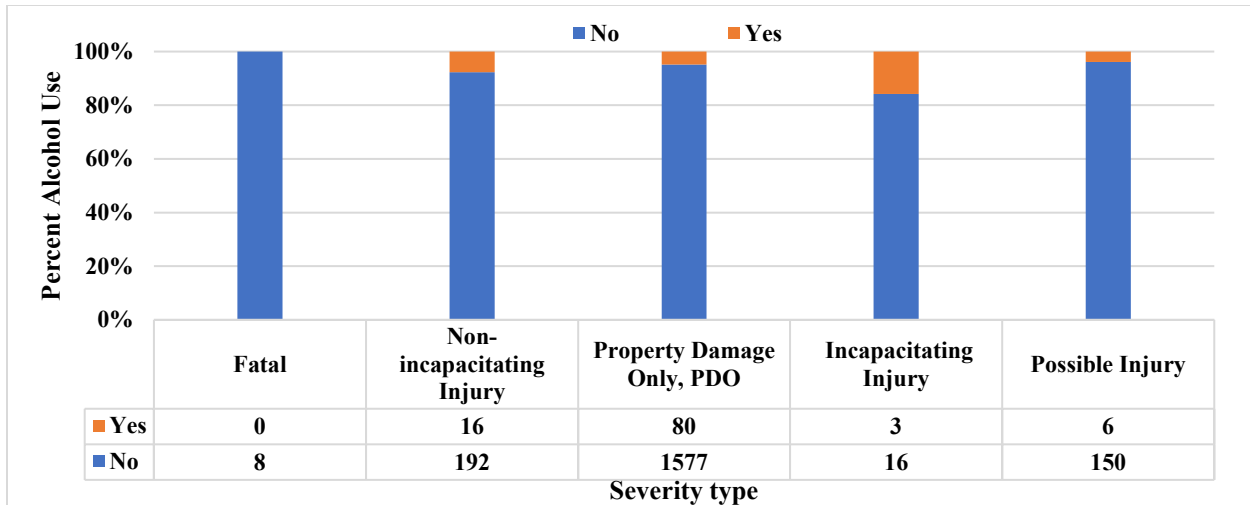2023). The safety equipment should be appropriately used to minimize the extent of the injury (Kashani et al. 2022). Table 4 shows the total number of crashes under each safety equipment. The data showed that crashes 63% of drivers involved in crashes use lap and shoulder belts.

Table 4 Safety equipment use data

Safety equipment type	Number of crashes
Restraint use unknown	1118
Not in use	43
Lap and shoulder	2191
Shoulder belt	27
Helmet worn	3
Lap belt only	40
Not applicable	32
Child safety seat (prop)	1

Figure 11 depicts the total number of male and female drivers involved in the crash for each age category. The number of male drivers involved was higher in 87% of the age categories. However, the number of female drivers involved in crashes was higher than male drivers for the age category of 19 years and younger. The male and female driver crash exposure was equal for those between 80 and 84 years. There were 3169 drivers involved in traffic crashes.
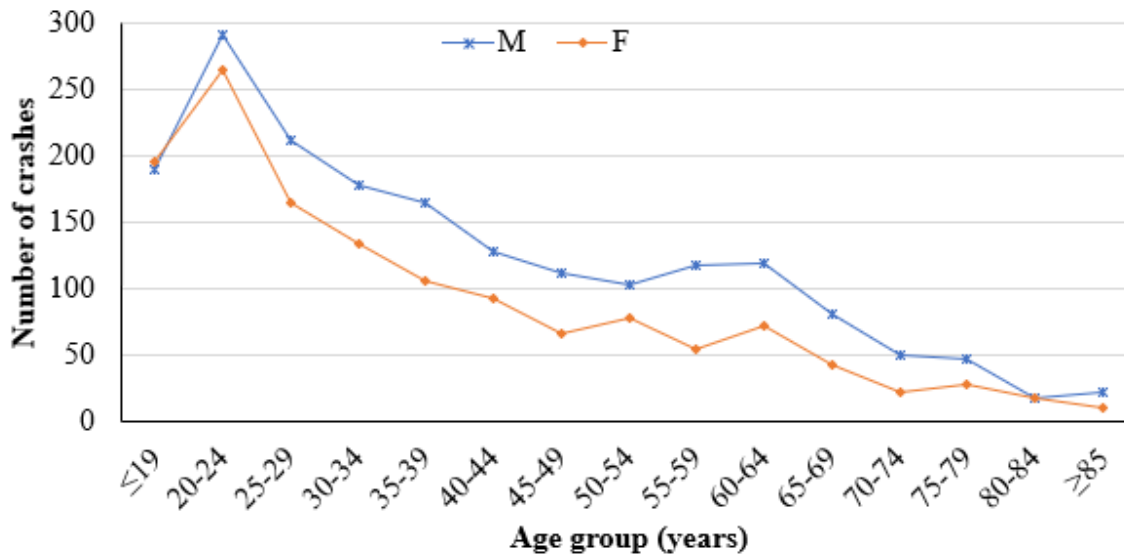
Figure 11 Age group and sex of drivers

The prevailing weather and road surface conditions affect the severity and probability of crash occurrence (Hammad et al. 2019; Malin et al. 2019; Zhai et al. 2019). Table 5 shows the crash scenes under each surface and weather conditions. Unfavorable weather and surface conditions can increase crashes. Of the total crashes, 41% occurred on dry pavement and clear sky conditions, while 17% occurred on icy roads and clear sky conditions.

Table 5 Road surface and weather conditions during the crash scene

Weather Condition	Surface Condition					
	Dry	Snow	Ice / Compacted Snow	Mud Dirt Gravel	Wet	Slush
Unknown	46	6	11	1	0	0
Clear	841	170	350	0	42	17
Cloudy	110	79	89	0	48	7
Rain	0	0	7	0	46	0
Snow	0	78	26	0	3	7
Blowing Snow	1	14	12	0	0	1
Sleet/Hail/Freezing Rain	0	6	18	0	2	1
Fog / Smoke / Dust	2	0	1	0	3	0
Severe Wind	1	0	1	0	1	0

Speed Violation Data Analysis

The speed data that spans from 2015 to 2022 was analyzed. The results show that roads such as 17th Ave S, Demers Ave, 24th Ave S, S Washington St, HN:297mm:3, S 20th St, Gateway Dr, 32nd

Ave S, Cherry St, Belmont Rd, And University Ave have higher rates of driver speed violation records. Most of the top-ranked roads have relatively higher traffic volume than the others. Table 6 summarizes the top 16 streets with the highest number of citations.

Table 6 Speeding Ticket Summary

Location	No. of ticketed drivers	Location	No. of speed violation
17th Ave S	2270	40th Ave S	159
Demers Ave	1861	Cherry St	158
24th Ave S	1681	S 34th St	150
Hn:297mm:3	567	S Columbia Rd	141
S 20th St	531	20th Ave S	129
S Washington St	501	32nd Ave S	107
Gateway Dr	414	N Washington St	97
Belmont Rd	179	S 48th St	80

6.2. Road Network Hotspot Analysis

The total number of hotspots for each analysis case, Gi* from EPDO, Gi* from CR, I_i from EPDO, and I_i from CR, were compared. Figure 12 a) and b) present the Gi* output using the EPDO and CR input parameters, respectively. The Central-East and Central-West parts of the Grand Forks city streets were identified as hotspots. The red graduated colors on the map depict the hotspot areas at confidence intervals of 90%, 95%, and 99%. Most hotspots were observed at intersections where streets with high traffic volumes intersect. The CR input only yielded hotspot areas at a CI of 95% and 99%. The CR input at p=0.05 established that only 1% of the road networks were hotspots, while 7% were statistically significant at p=0.01. The EPDO technique revealed that there were 17% and 4% statistically significant hotspots at 0.01 and 0.05 p-values, respectively. Table 7 summarizes the Gi* statistic outputs for EPDO and CR input parameters under each p-value. There were more hotspot road segments for the hotspot analysis using EPDO than CR.

Table 7 Getis Ord Gi* results summary

Input Parameter	Coldspot (%)			Hotspot (%)			Not Significant (%)
	p=0.01	p=0.05	p=0.1	p=0.01	p=0.05	p=0.1	
EPDO	5	10	6	17	4	1	57
CR	0	0	0	7	1	0	92
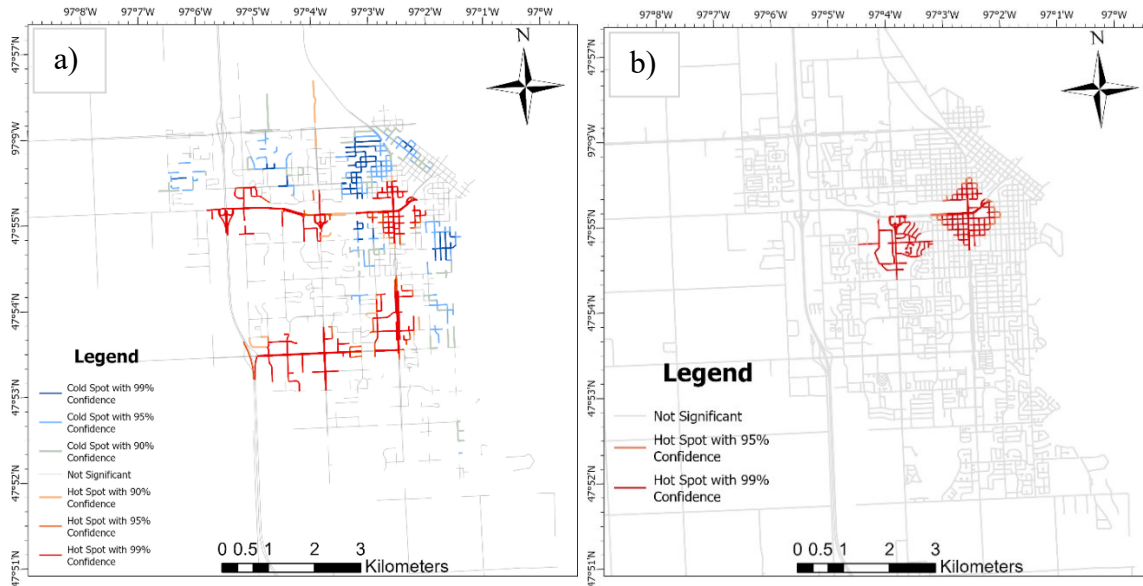
Figure 12 Hotspot results using a) Gi* - EPDO and b) Gi* - CR

The Anselin Local Moran's (AMI) I statistics were also calculated to check the consistency of the output variation for the EPDO and CR input parameters. Figure 13 a) and b) demonstrate the I-statistic cluster and outlier outputs from EPDO and CR, respectively. There were more HH clusters for the EPDO input parameter than the CR. The HL and LH outliers from the EPDO analysis were dispersed. Most road networks were identified as LL clusters for the CR analysis, with a p-value of 0.05. The LL-clustered roads are surrounded by roads with low CR values.

Figure 13 Crash hotspots using a) AMI - EPDO and b) AMI - CR

Table 8 provides road segment percentage summaries for each output cluster and outlier category. The percentage of outliers and clusters for the EPDO was higher than the CR. The I-statistic with

a 0.05 p-value revealed that 10% and 3% of the road networks were identified as HH clusters from EPDO and CR, respectively. The non-significant road networks for CR were higher than the EPDO, consistent w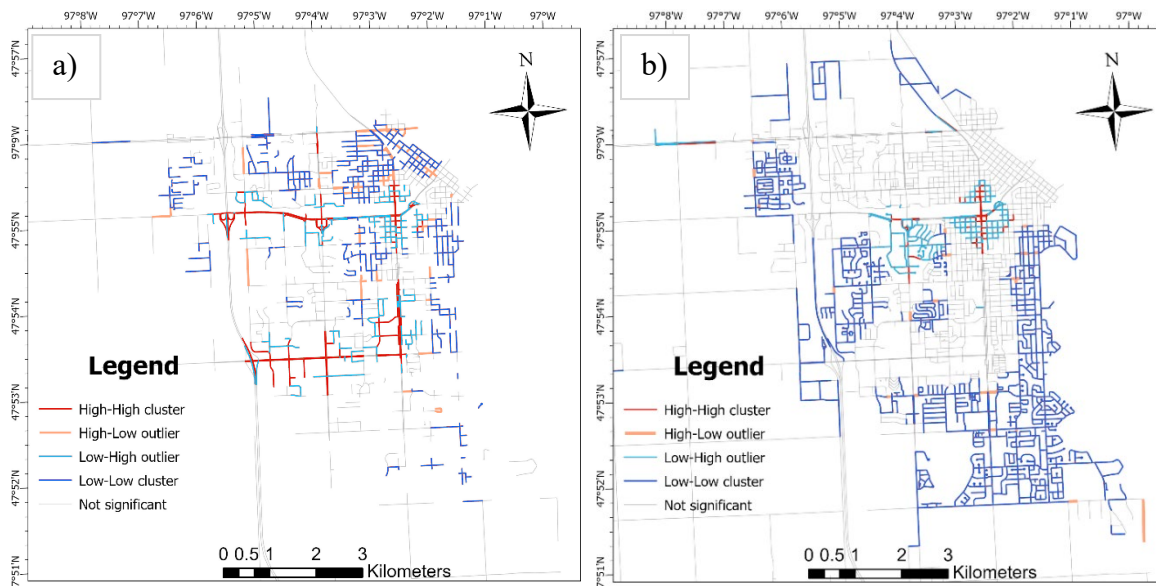ith the Gi* statistic summary. The p-values for clusters and outliers were less than 0.05 with different Z-scores, negative for outliers, and positive for clusters. The Z-score for the non-significant road segments was between -1 and 1, while the p-values were above 0.05.

Table 8 AMI (I_i) results summary

Input Parameter	HH Cluster (%)	HL Outlier (%)	LH Outlier (%)	LL Cluster (%)	Not significant (%)
EPDO	10	4	13	28	44
CR	3	1	5	31	60

6.3. Spatio-Temporal Analysis

The Emerging Hotspot Analysis results established the spatiotemporal correlation between crashes. Figure 14 a) depicts the crash data temporal summary analyzed from the raw crash data. The crashes occurred predominantly during the winter season, which comprises December, January, and February. Figure 14 b) presents the statistical summary of the hotspot areas. There were no spatiotemporal patterns for the majority of the crashes. Only 16 spatiotemporal patterns were detected out of the total 235 location bins. The detected patterns included Diminishing Hotspots, Sporadic Hotspots, and New Coldspots. There were 13 sporadic hotspots and two diminishing hotspot areas. The sporadic areas were spatial bins under observation and continually switched from being a hotspot to not being a hotspot and to being a hotspot again. The hotspots had a p-value less than 0.05 and a negative Z-score. The percent significance for the diminishing hotspots was 94%, while it ranged from 61% to 88% for the sporadic hot zones. The New Coldspot region had a 5.5% significance and p-value higher than 0.05. A post-comparison of the raw data and the spatiotemporal analysis indicated that the sporadic and diminishing hotspots were primarily due to the crashes that occurred in the winter.
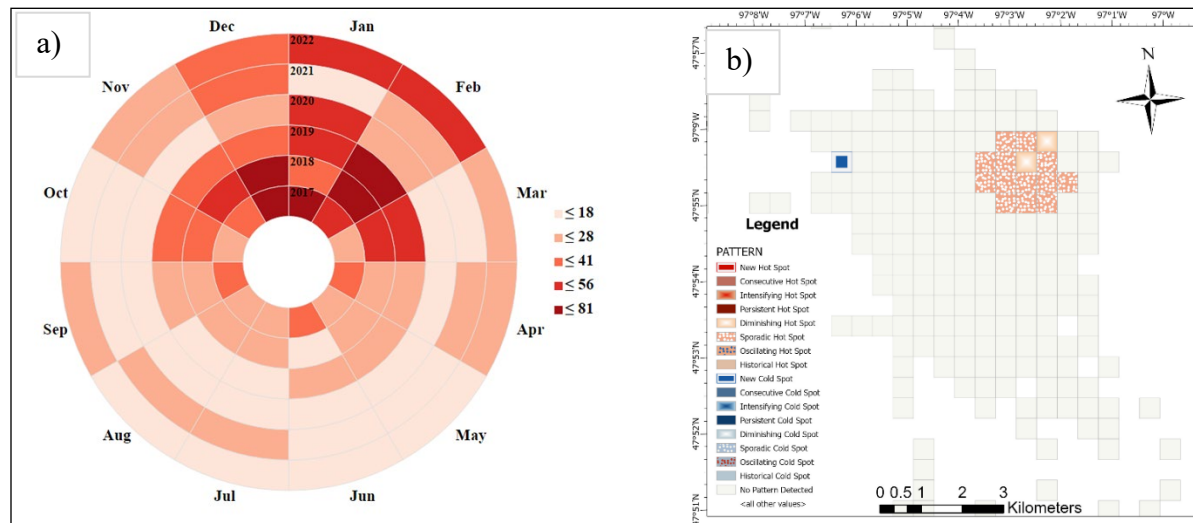

Figure 14 a) Crash Data Clock and b) Emerging Hotspot Spatiotemporal Analysis

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Similarity Test

The Hotspot Analysis Comparison tool was used to compare and check the spatial association between the hotspots from the EPDO and CR input parameters. Table 9 presents the percentage of EPDO hotspots within the CR hotspot at each confidence interval. Only 15.79% of the CR hotspots were identified as EPDO hotspots at the given CI. The similarity value-SV, including the non-significant road segments, was 0.72, and the expected similarity value-ESV between the two results was 0.59. The Spatial Fuzzy Kappa, which scales the SV by ESV, was computed as 0.31. The Kappa value between 0.2 and 0.4 revealed that the hotspot results had a fair spatial association.

Table 9 Hotspot results comparison using the significance level

CR-Hotspot Significance Level	EPDO-Hotspot Significance Level						
	Coldspot 99%	Coldspot 95%	Coldspot 90%	Not Significant	Hotspot 90%	Hotspot 95%	Hotspot 99%
Coldspot 99%	0	0	0	0	0	0	0
Coldspot 95%	0	0	0	0	0	0	0
Coldspot 90%	0	0	0	0	0	0	0
Not Significant	5.96	10.72	7.04	62.18	0.95	2.54	10.6
Hotspot 90%	0	0	0	0	0	0	0
Hotspot 95%	0	0	0	31.58	10.53	15.79	42.11
Hotspot 99%	0	0.53	0	13.76	2.12	12.7	70.9

6.4. Association Rule Mining

This study obtained relevant patterns meeting both relatively high frequency and confidence criteria through filtering. Table 10 summarizes the statistical association summary between variables in the dataset.

Table 10 Association between crash variables

Rule	Frequency	Support	Confidence	Lift
First Harmful Event → Manner of Collision				
Collision with an object (Not fixed) → Angle Collision	660	0.32	100.00%	1.17
Intersection Type → Manner of Collision				
Multi-leg intersection → Angle Collision	660	0.20	61.52%	1.86
Intersection Type → Crash Severity Class				
Non-intersection →Fatal Injury	27	0.01	66.67%	1.17
Light Description → Manner of Collision				
Daylight → Angle Collision	651	0.29	84.02%	1.12
Relation to Junction Location → Crash Severity Class				
Non-Junction → Fatal Injury	27	0.01	55.56%	1.13
Relation to Junction Location → Manner of Collision				
Interchange Related → Single Vehicle Crash	42	0.01	57.14%	1.91
Weather Condition → Manner of Collision				
Hazardous → Single Vehicle Crash	169	0.03	40.24%	1.41

The support metric specifies the frequency of the rule in the dataset, while confidence measures how often the rule is true when the antecedent (left side) is true. Lift indicates the strength of the association between the rule's antecedent and consequent (right side), with values greater than 1 indicating a positive association. These rules can be valuable for understanding and potentially mitigating the causes and consequences of traffic incidents. For instance, in incidents involving "Collision with an object (Not fixed)," there is a high likelihood (100% confidence) of an "Angle Collision" as the collision manner. The support of 0.32 indicates that this pattern is relatively common in the dataset. The lift of 1.17 suggests that this association is slightly more likely to occur than if the two events were independent.

6.5. Trafic Crash and Speeding Data Analysis

On the reported data, the exact location for most of the speeding citations was not reported, and the citations were assumed to exist at any point along the reported road section. Figure 15 summerizes the streets with more number of traffic speeding citation. The cited drivers were assumed to travel with the same speed along the street. The streets such as 17th Ave S, Demers Ave, and 24th Ave S had the highest speeding citation records.
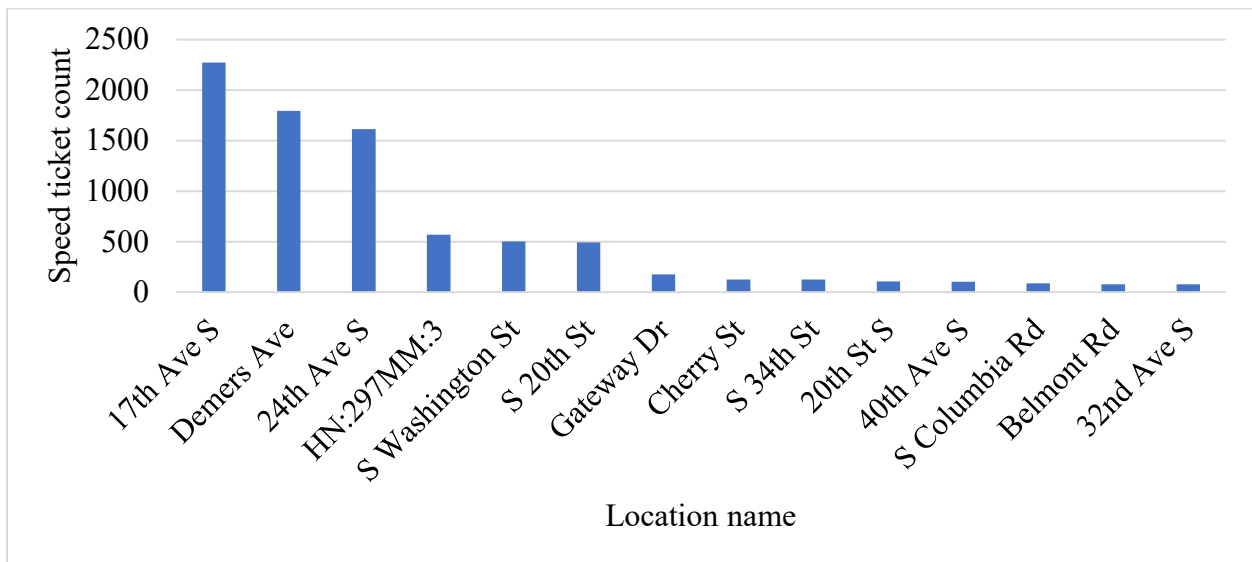
Figure 15 Speed ticket count per street

The speed-related crashes were extracted and the heatmap for those crashes were mapped using ArcGIS Pro software. Figure 16 presents heatmap for speed-related traffic crashes. The regions with a solid yellow color were found to have more dense speed-related traffic crashes, and the purple colors signify areas of sparse crash records. The heatmap shows that the speed-related crashes were mostly found near intersections.
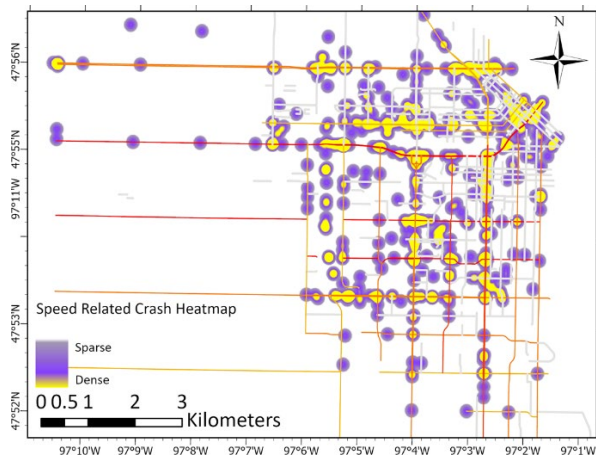
Figure 16 Speed-related traffic crashes heatmap

The areas from identified from the speed-related crashes and speeding ticket data are a major concern. Figure 17 depicts areas of significant traffic crashes, speed-related crashes, and speed violations. The areas highlighted with black oval shapes experience significant traffic crash areas and a higher number of speed violations. The areas along Demers Ave, S Washington St, 32nd Ave, and S Columbia Rd have higher speeding and crash rates during the study period. Though the other roads, such as 17th Ave S, 24th Ave S, and S 20th St, have more speeding violation records, the crashes near these areas were not significant.
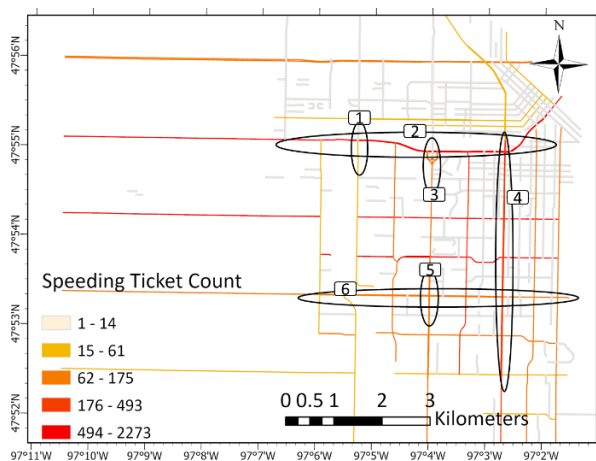
Id	Location Name
1	Demers Ave and S 42ND ST Intersn.
2	Demers Ave
3	Demers Ave and S Columbia Rd Intersn.
4	S Washington St
5	32nd Ave S
6	32nd Ave S and S Columbia Rd Intersn.

Figure 17 Roads with high speeding citation records and significant crashes

6.6. Effect of Traffic Signs on Speed

The minimum, average, 85th percentile, and maximum speeds at all locations were calculated from the collected data. The presence of the within-crosswalk signs resulted in a lower average speed for both in-school sessions and times when schools were not in session. The 85th percentile speed was also lower when the traffic signs were present on the road crosswalk. The minimum and maximum speeds observed were generally higher for the without conditions, and there were some exceptions where the drivers traveled at a higher speed regardless of the traffic signs. Figure 18 summarizes the speed data and standard deviation when schools were not in session.

a)

b)

c)

d)
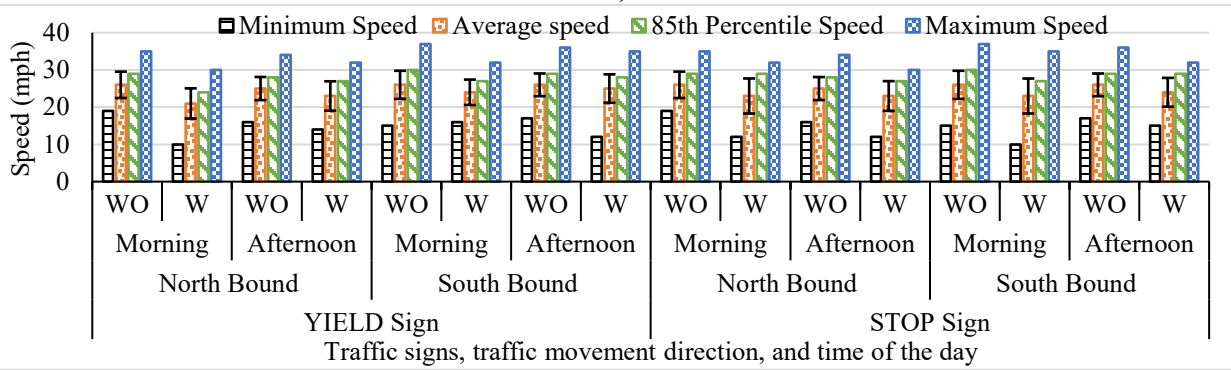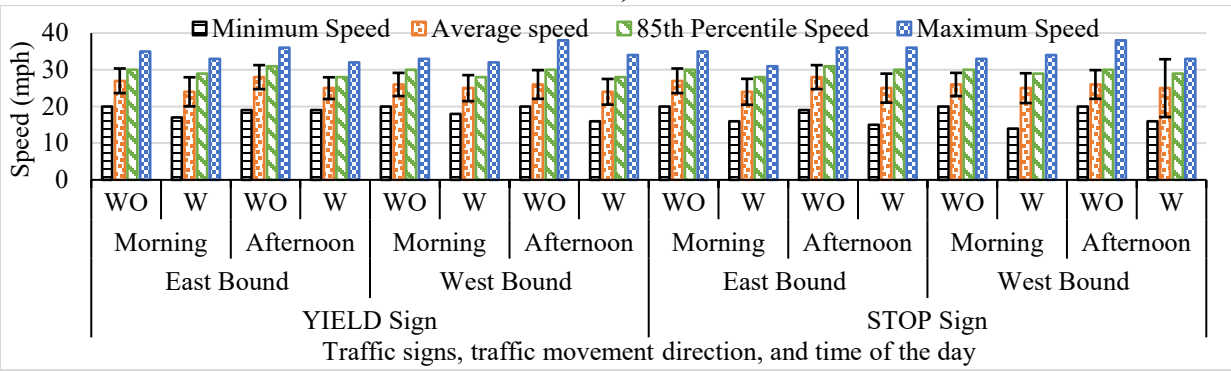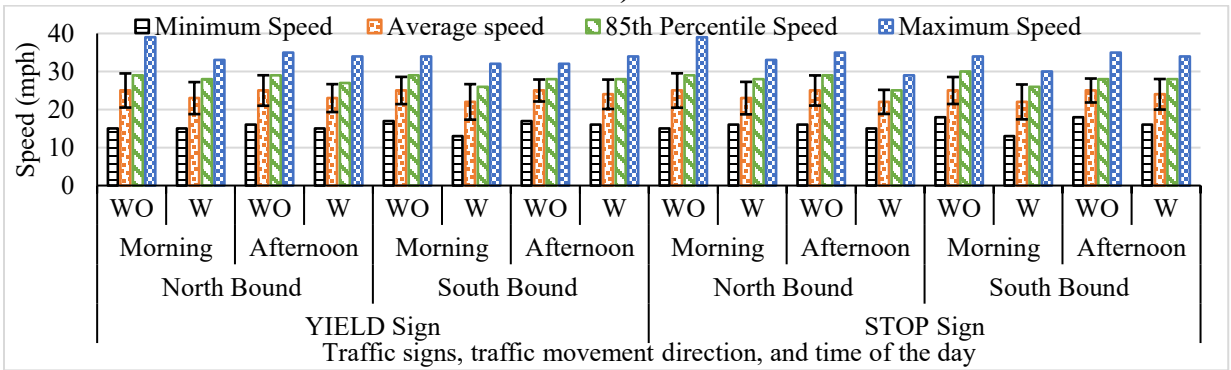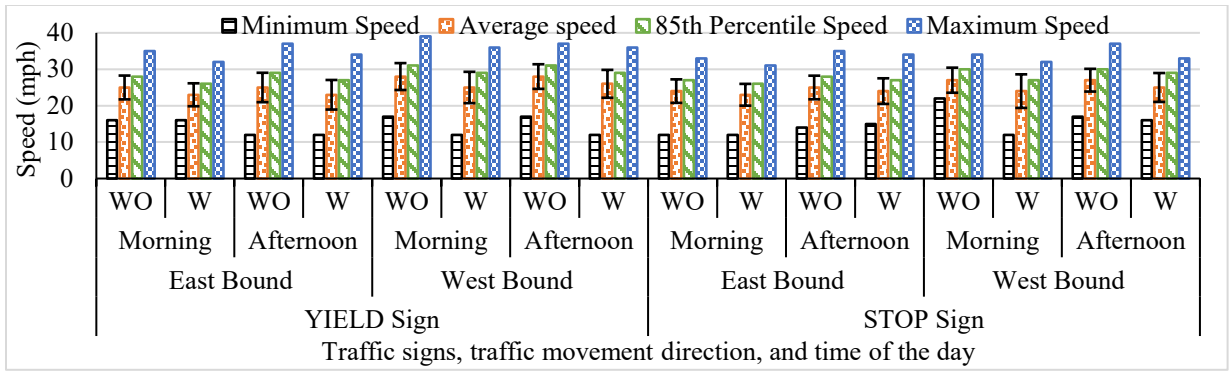
Figure 18 Speed data summary: no-school session a) 6th Ave N, b) 11th Ave S, c) 25th Ave S, and d) Cherry St

The speed reduction pattern was also similar for the in-school session data. Figure 19 summarizes the speed analysis results with standard deviation for the in-school session data.

a)

b)

c)

d)
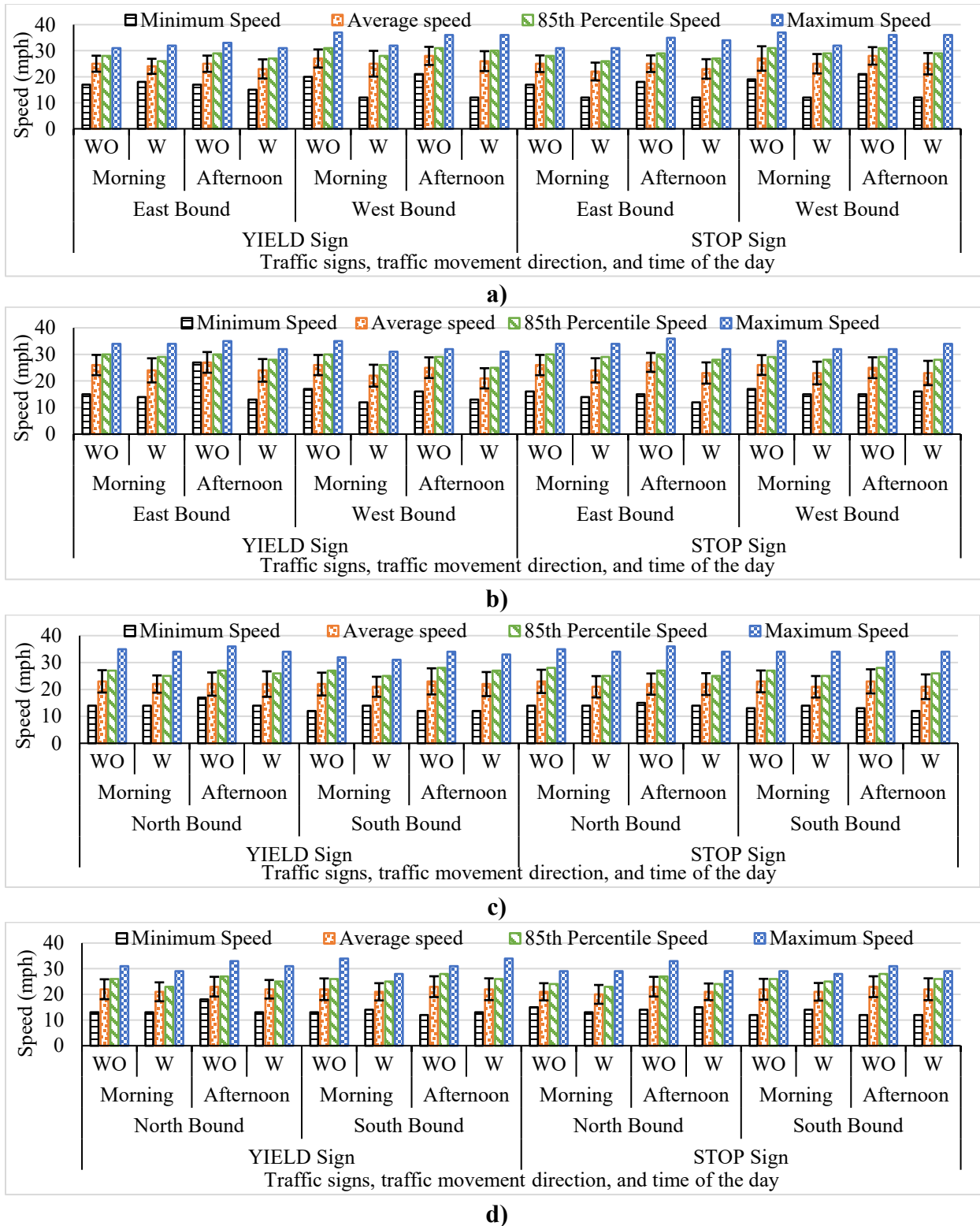
Figure 19 Speed data summary: in-school session a) 6th Ave N, b) 11th Ave S, c) 25th Ave S, and d) Cherry St

An independent t-test with a significance level of 0.05 indicated the presence of significant differences in the average speeds at the two conditions. The study areas have similar features, and the individual values can be added to check the overall significance of the differences (Gedafa et al. 2014). The overall tests revealed that the speed reduction due to the traffic signs significantly reduced the average speed; therefore, the null hypothesis was rejected.

Table 11 presents the statistical test summary for both traffic signs during in-school sessions and times when schools were not in session. The results indicate that the presence of traffic signs resulted in a significant reduction in the average speed of drivers at all locations. A significant average speed reduction was observed in more than 93% and 87% of the total cases for the YIELD and STOP signs, respectively, when schools were not in session. Likewise, 81% and 75% of the cases attributed to YIELD and STOP signs, respectively, indicated a decrease in speed during in-school sessions. The standard deviation for more than 99% of the cases ranged from 3 mph to 5mph.

The study areas have similar features, and the individual values can be added to check the overall significance of the differences (Gedafa et al. 2014). The overall tests revealed that the speed reduction due to the traffic signs significantly reduced the average speed; therefore, the null hypothesis was rejected.

Table 11 Significant difference test for traffic speed

No- School session

Street name	Direction	Time	YIELD sign WO Avg Speed	n	YIELD sign W Avg Speed	n	Sig. Diff. p-value (95% CI)	STOP sign WO Avg Speed	n	STOP sign W Avg Speed	n	Sig. Diff. p-value (95% CI)
6th Ave N	EB	M	25	193	23	168	<0.0001 S	24	168	23	153	0.0005 S
		A	25	138	23	152	<0.0001 S	25	161	24	145	0.0016 S
	WB	M	28	129	25	128	<0.0001 S	27	68	24	60	<0.0001 S
		A	28	155	26	158	<0.0001 S	27	86	25	58	0.0158 S
11th Ave S	EB	M	27	40	25	52	0.0017 S	27	50	24	67	0.0001 S
		A	28	63	25	86	<0.0001 S	28	56	25	76	<0.0001 S
	WB	M	26	45	25	79	0.0372 S	26	52	25	73	0.0732 N
		A	26	59	24	74	0.0005 S	26	62	25	67	0.0193 S
Cherry St	NB	M	26	53	21	64	<0.0001 S	26	63	23	49	0.0017 S
		A	25	100	23	94	<0.0001 S	25	88	23	82	0.0008 S
	SB	M	26	70	24	89	0.0002 S	26	61	23	66	0.0005 S
		A	26	99	25	84	0.0279 S	26	111	24	90	<0.0001 S
S 25th St	NB	M	25	50	23	63	0.0095 S	25	49	23	52	0.0308 S
		A	25	56	23	67	0.0044 S	25	54	22	56	<0.0001 S
	SB	M	25	57	22	55	0.0006 S	25	44	22	50	0.0004 S
		A	25	84	24	58	0.1942 N	25	68	24	58	0.2206 N
S 34th St	NB	M	32	114	30	98	<0.0001 S	35	53	31	80	<0.0001 S
		A	33	104	30	94	<0.0001 S	34	71	31	76	<0.0001 S
	SB	M	30	69	27	79	<0.0001 S	30	69	28	60	0.0003 S
		A	30	95	27	87	0.0018 S	30	96	27	94	0.0020 S
Overall		M	25.7	820	23.6	875	<0.0001 S	25.4	677	23.8	710	0.0021 S
		A	25.9	952	23.9	954	<0.0001 S	26.1	853	23.9	802	<0.0001 S

School session

Street name	Direction	Time	YIELD sign WO Avg Speed	n	YIELD sign W Avg Speed	n	Sig. Diff. p-value (95% CI)	STOP sign WO Avg Speed	n	STOP sign W Avg Speed	n	Sig. Diff. p-value (95% CI)
6th Ave N	EB	M	25	102	24	92	0.0015 S	25	96	22	89	<0.0001 S
		A	25	94	23	88	<0.0001 S	25	85	23	94	<0.0001 S
	WB	M	27	73	25	60	0.0004 S	27	89	25	99	0.0039 S
		A	28	67	26	72	0.0067 S	28	80	25	74	0.0003 S
11th Ave S	EB	M	26	70	24	76	0.0023 S	26	60	24	67	0.0011 S
		A	27	62	24	69	0.0035 S	27	73	23	55	<0.0001 S
	WB	M	26	56	22	48	<0.0001 S	26	52	23	45	0.0011 S
		A	25	44	21	54	<0.0001 S	25	43	23	62	0.0027 S
Cherry St	NB	M	22	78	21	80	0.0362 S	21	94	20	83	0.2887 N
		A	23	90	22	71	0.0063 S	23	55	21	67	0.0148 S
	SB	M	22	81	21	62	0.0211 S	22	73	21	81	0.6718 N
		A	23	98	22	75	0.2132 N	23	69	22	59	0.0487 S
S 25th St	NB	M	23	57	22	71	0.1697 N	23	59	21	78	0.0060 S
		A	22	77	22	61	0.4975 N	22	53	22	66	0.3385 N
	SB	M	22	67	20	54	0.0419 S	23	79	21	73	0.0122 S
		A	23	70	21	62	0.0308 S	23	64	21	50	0.1740 N
Overall		M	24.1	584	22.3	543	<0.0001 S	23.9	602	22.4	615	<0.0001 S
		A	24.4	602	22.8	552	<0.0001 S	24.7	522	22.6	527	<0.0001 S

S: Significant at a 0.05 significance level,   N: Not significant at a 0.05 significance level.

6.7. Effect of Traffic Signs on Yielding to Pedestrians

The proportion of drivers who yielded to pedestrians to the total number of scored drivers for each location was calculated and used for the statistical analysis. Table 12 presents the summary of the significant tests. The raw data illustrates that the YIELD and STOP signs both increased the proportion of drivers yielding to pedestrians; however, the yielding proportion was significant for only 56% and 68% of the individual cases for YIELD and STOP signs, respectively. The traffic sign conditions resulted in higher yielding proportions; however, sites such as 6th Ave N and Cherry St exhibited more cases where the results were insignificant. This discrepancy might be linked to higher driving speeds and relatively elevated instances of speeding violations at these locations.

The statistical tests demonstrated that the presence of traffic signs significantly increased the proportion of drivers yielding to pedestrians across all locations. Specifically, the STOP sign condition exhibited a higher number of significant cases. The null hypothesis can be rejected based on the calculated overall p-values, which were all below the significance level.

6.8.Comparison of the Effect of In-Crosswalk YIELD and STOP Signs

Table 13 summarizes the effectiveness comparison of the traffic signs on speeding. The results indicate that the overall effectiveness of the within-crosswalk STOP and YIELD signs was comparable. The effectiveness of the signs was significantly different at 6th Ave N at times when schools were not in session. The STOP signs resulted in a relatively lower average speed value than the YIELD signs; however, the average speeds for both cases had p-values higher than the confidence level at the other three locations. Furthermore, the differences in average speed values at all locations due to the traffic signs were insignificant. The null hypothesis cannot be rejected since the p-values for the overall cases were higher than 0.05.

Another comparison between the effectiveness of the two signs was performed using the effect on yielding to pedestrians. Table 14 presents the yielding proportion differences between the two signs. The significance proportion test indicated that the yielding proportion differences between the two signs were insignificant at all locations; therefore, the signs had a comparable effect and can be used to reduce speed and increase yield to pedestrians on two or three-lane streets.

Table 12 Significant difference test using Chi-square (χ2) and Proportion test for yielding

YIELD Sign

Street name	Direction	Time of the day	Yielding data (Proportion)		Significance test		Combined
			WO	W	χ2 (p-value)	z-score, (p-value)	
6th Ave N	East	M	57 (66.7)	64 (89.1)	8.964 (0.003) S	-2.994 (0.003) S	-4.627 (<0.00001) S
		A	66 (69.7)	67 (91.0)	9.634 (0.002) S	-3.104 (0.002) S	
	West	M	63 (69.8)	56 (83.9)	3.270 (0.071) N	-1.808 (0.070) N	
		A	59 (67.8)	68 (79.4)	2.216 (0.137) N	-1.487 (0.136) N	
11th Ave S	East	M	54 (72.2)	61 (90.2)	6.177 (0.012) S	-2.485 (0.013) S	-4.492 (<0.00001) S
		A	63 (76.2)	60 (91.7)	5.406 (0.020) S	-2.325 (0.020) S	
	West	M	53 (84.9)	47 (91.5)	1.023 (0.312) N	-1.011 (0.313) N	
		A	56 (76.8)	59 (96.6)	9.955 (0.002) S	-3.155 (0.002) S	
Cherry St	North	M	90 (68.9)	84 (83.8)	4.951 (0.026) S	-2.225 (0.026) S	-2.950 (0.0032) S
		A	83 (71.1)	81 (77.8)	0.964 (0.326) N	-0.982 (0.327) N	
	South	M	80 (68.8)	84 (81.0)	3.254 (0.071) N	-1.804 (0.072) N	
		A	70 (82.9)	76 (86.8)	0.452 (0.501) N	-0.672 (0.503) N	
S 25th St	North	M	73 (74.0)	78 (92.3)	9.176 (0.002) S	-3.029 (0.002) S	-4.804 (<0.00001) S
		A	75 (76.0)	73 (86.3)	2.559 (0.109) N	-1.599 (0.109) N	
	South	M	83 (75.9)	87 (92.0)	8.191 (0.004) S	-2.862 (0.004) S	
		A	80 (73.8)	85 (87.1)	4.669 (0.031) S	-2.161 (0.031) S	

STOP Sign

Street name	Direction	Time of the day	WO	W	χ2 (p-value)	z-score, (p-value)	Combined
6th Ave N	East	M	58 (60.7)	74 (93.2)	11.908 (0.001) S	-3.451 (0.001) S	-3.753 (0.0002) S
		A	59(76.3)	70 (80.0)	0.262 (0.609) N	-0.512 (0.610) N	
	West	M	63 (76.2)	64 (84.4)	1.345 (0.246) N	-1.159 (0.246) N	
		A	65 (75.4)	71 (91.5)	6.539 (0.011) S	-2.557 (0.011) S	
11th Ave S	East	M	58 (72.4)	67 (91.0)	5.949 (0.015) S	-2.439 (0.015) S	-4.070 (<0.00001) S
		A	63 (73.0)	68 (92.6)	5.556 (0.018) S	-2.357 (0.018) S	
	West	M	56 (83.9)	49 (91.8)	1.507 (0.219) N	-1.227 (0.219) N	
		A	46 (73.9)	43 (90.7)	4.246 (0.039) S	-3.061 (0.039) S	
Cherry St	North	M	81 (69.1)	78 (89.7)	10.26 (0.001) S	-3.203 (0.001) S	-4.273 (<0.00001) S
		A	74 (73.0)	77 (84.4)	2.958 (0.085) N	-1.720 (0.085) N	
	South	M	70 (72.9)	73 (83.6)	2.412 (0.120) N	-1.553 (0.121) N	
		A	73 (76.7)	75 (89.3)	4.198 (0.041) S	-2.049 (0.040) S	
S 25th St	North	M	79 (74.7)	82 (90.2)	6.781 (0.009) S	-2.604 (0.009) S	-4.761 (<0.00001) S
		A	88 (73.9)	75 (88.0)	5.128 (0.024) S	-2.265 (0.024) S	
	South	M	76 (68.4)	79 (83.5)	4.875 (0.027) S	-2.208 (0.027) S	
		A	79 (69.6)	74 (86.5)	6.289 (0.012) S	-2.508 (0.012) S	

S: Significant at a 0.05 significance level,   N: Not significant at a 0.05 significance level.

Table 13 Significant difference test between YIELD and STOP signs: Speed data summary

Location	No-school Session				Sig. Diff (95% CI)	In-School Session				Sig. Diff (95% CI)
	YIELD sign		STOP sign			YIELD sign		STOP sign		
	Avg Speed	n	Avg Speed	n		Avg Speed	n	Avg Speed	n	
6th Ave N	24.1	606	23.5	416	0.0017 S	24.2	312	24.1	356	0.6599 N
11th Ave S	24.8	291	24.9	283	0.7064 N	23.0	247	23.2	229	0.5866 N
Cherry St	23.2	331	23.4	287	0.5447 N	21.3	288	21.0	290	0.3122 N
S 25th St	23.1	243	23	216	0.7359 N	21.2	248	21.3	267	0.8949 N
Overall	23.9	1471	23.7	1202	0.3410 N	22.5	1095	22.5	1142	0.8144 N

S   Significant at a 0.05 significance level,   N Not significant at a 0.05 significance level.

Table 14 Significant difference test between YIELD and STOP signs: Yield data summary

Location	YIELD	STOP	z-score (p-value)	Combined z-score (p-value)
6th Ave N	255 (85.9)	279 (87.5)	-0.535 (0.596) N	-0.497 (0.617) N
11th Ave S	227 (92.5)	204 (91.2)	0.506 (0.610) N	
Cherry St	325 (82.2)	303 (86.8)	-1.603 (0.110) N	
S 25th St	323 (89.5)	310 (87.1)	1.036 (0.298) N	

S   Significant at a 0.05 significance level,   N Not significant at a 0.05 significance level.

7. CONCLUSIONS

The subsequent conclusions can be drawn based on the results of the analysis:

- The Emerging Hotspot Analysis is effective in identifying spatiotemporal crash clustering. There were more crashes in the winter when snow accumulation was high and the weather was cold.
- The Anselin Local Moran's I and Getis Ord Gi* statistical tools can be used to identify hotspots in a road network, which are areas that need significant attention.
- The EPDO and CR can be used as input parameters to identify hotspots; however, the EPDO input parameter yields more hotspots than the CR.
- The streets such as 17th Ave S, Demers Ave, and 24th Ave S roads have more speed citation record. Moreover, Demers Ave, S Washington St, S Columbia Rd, 32nd Ave, and the intersections between these roads have more frequent speed violations and crashes.
- The introduction of crosswalk STOP and YIELD signs led to a decrease in both average and 85th percentile speeds, establishing significant reductions in speed.
- The changes in vehicle speed were significant across various times, including mornings, afternoons, and whether or not schools were in session. Implementing these regulatory signs could effectively lower the risk of speed-related traffic crashes.
- The presence of traffic signs significantly enhanced yielding behavior toward pedestrians. Placing these signs at the crosswalk could potentially reduce traffic-related pedestrian crashes.
- There was no significant difference between the impact of the two types of traffic signs on speeding and yielding behaviors. This finding implies that transportation planners have the flexibility to use either sign to enhance pedestrian and overall road safety.

FUTURE WORKS

- Analysis of the effectiveness of other traffic calming measures will be done using a cross-sectional approach, and safety approach recommendations that consider the context of Grand Forks will be made.
- Analysis for signal warrants at intersections will be done. The hot spot analysis result will be used as an initial criterion.

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MPO Unified Planning Work Program 2024-2025

Task	Update	% Completed	Local Adoption	State/ Federal Approval
Street & Highway Plan / MTP	Final Approval	100%	Nov./Dec. 2023	Jan. 2024
ATAC - Planning Support Program	On-going			
TIP Adoptions and Amendments	On-going			
ITS Architecture	2024 Project	10%	Aug./Sep. 2024	Sep. 2024
ATAC - Traffic Counting Program	On-going			
Land Use Plan	2025/2026		Oct./Nov. 2026	Dec. 2026
Future Bridge Discussions/Assistance	On-going/As needed			
Updating Policy and Procedures/By-Laws	On-going			
Micro Transit Study	2025 Project		Oct./Nov. 2025	Dec. 2025
Grand Valley Study	No proposals were received	5%	TBD	TBD
Safe Streets For All (SS4A) Grant	Three proposals have been received	3%	TBD	Sep. 2025
Functional Class	2024 Project		TBD	TBD
One-way Pairs	2024/2025 Project		TBD	TBD
Safety Targets	On-going			
Bike Map	2024/2025 Updated at the beginning of the year	85%		