APWA MINNESOTA CHAPTER
PUBLIC WORKS PROJECT OF THE YEAR NOMINATION FORM

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Submission Deadline: October 1, 2022

All nomination and supporting data are to be submitted as a PDF to Sarah at sarah.lloyd@bolton-menk.com with a maximum page size of 5 pages, including photos.

Project Nominated: Southeast Main Avenue / 20th / 21st Street Railroad Grade Separation Project

Managing Agency: City of Moorhead
Contact Person: Tom Trowbridge
Agency Address: 500 Center Ave, Moorhead, MN 56560
Agency Phone Number: 218-299-5390
Email: klarue@srfconsulting.com

Project Design Firm: SRF Consulting Group
Project Construction Administration Firm: SRF Consulting Group
Project General Contractor: Ames Construction

Name of Person Making Nomination: Kevin LaRue, PE
Phone Number: 701-893-7413
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Criteria for Nomination

- Project must be substantially completed by October 31, 2021 or October 31, 2022.
- Includes use of innovative construction management techniques and completion of the project on schedule.
- Maintained excellent safety performance and safety program throughout construction.
- Evidence of strong community relations during all project phases.
- Consideration given to the environment. Sustainable design techniques involved.
- Unusual accomplishments given adverse conditions.
- Provides future value to the public works profession and perception by the public.
- Additional considerations such as value engineering, innovative project financing, multi-agency coordination and participation.

Reasons for Nomination: Describe the project with the aspects and features of the project that fulfilled any of the applicable criteria listed. (Include description on a separate page.)

APWA Minnesota Chapter
American Public Works Association

PROJECT OF THE YEAR AWARD

Southeast Main Avenue / 20th / 21st Street Railroad Grade Separation Project

City of
Moorhead, Minnesota

MOORHEAD
MINNESOTA

SRF

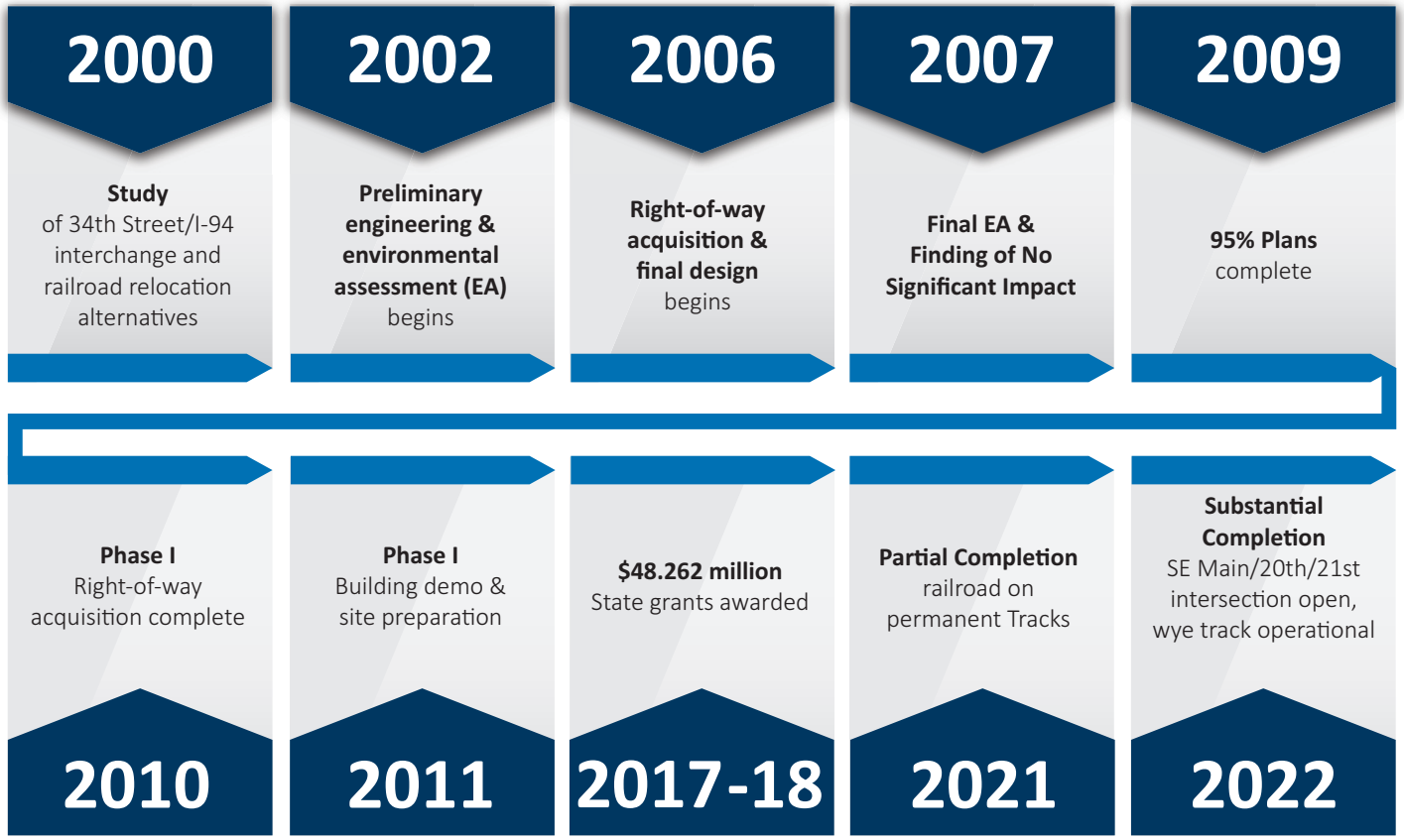
The City of Moorhead is bisected by five active freight rail tracks, one of which also carries AMTRAK passenger service, impacting the city in numerous ways. Currently, 35+ trains a day pass through this area in Moorhead according to FM Metro COG. This has greatly affected the City's planned program of community improvements aimed at revitalizing the central business district and facilitating new development in rapidly growing areas. The redevelopment efforts involved Moorhead's citizenry, local planning and transportation agencies, area businesses, and other civic organizations and great amount of public testimony gathered during the planning process documented concerns shared by businesses and citizens that a comprehensive rail safety program was needed – one that would fully implement the community's vision. Without rail safety improvements, it was felt that community revitalization could not be fully achieved.

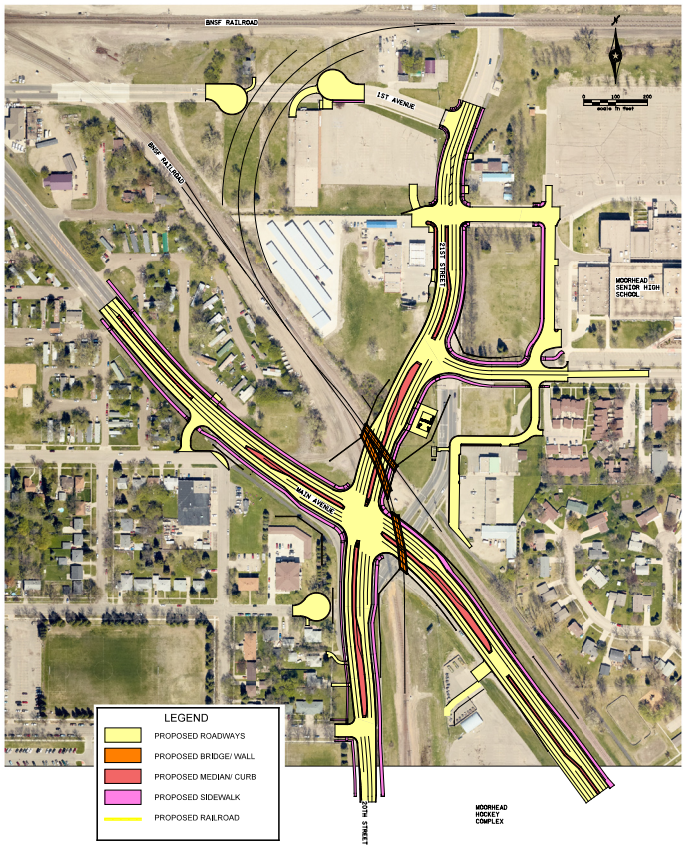
The SE Main Avenue/20th/21st Street Railroad Grade Separation project was identified as a priority element of the City's 20-year Comprehensive Rail Safety Strategy that has become critical to the downtown's revitalization and the community's development program. The strategy aims to minimize the impacts of heavily used freight and AMTRAK rail trackage through the heart of the city while maximizing bicycle, pedestrian, and vehicular safety. The City can now capitalize on the significant infrastructure investments it has already made, including this project, and continue its successful economic redevelopment program and promote new development.

The project entailed constructing three grade-separated highway underpasses of the Burlington Northern Santa Fe (BNSF) and RailAmerica/G&W railroads at the skewed intersection of SE Main Avenue and 20th/21st Street in Moorhead. This project enables high volumes of vehicle traffic (including significant amounts of school buses), bicyclists, pedestrians, and transit vehicles to safely and efficiently move through the heavily traveled junction of these arterial streets and two freight rail lines. It included:

- Construction of a "wye" rail connection that improves northbound-to-eastbound and westbound-to-southbound train movements, allowing trains to directly travel eastbound to the BNSF Rail Yard, located in Dilworth. Prior to this project, trains blocked three to five high-volume, at-grade railroad crossings in downtown Moorhead while they were forced to wait for trains to back up into the yard.
- Construction of various ancillary improvements, a pump station, discharge pipes, retaining walls, and related utility relocations to enhance public safety and environmental sustainability.
- Construction of sidewalks and trails along SE Main Avenue, 20th Street, and 21st Street, which closed gaps in the metro bicycle/pedestrian system and greatly improved pedestrian and bicycle safety.

As a result of this project, the potential for economic growth has increased, environmental and safety hazards have been reduced or eliminated, emergency response times and evacuation routes have improved, and community livability has been enhanced.





Project Benefits

Short Term

Prior to construction, the existing at-grade rail crossing created safety and congestion problems, was a freight bottleneck, reduced modal connectivity and commuter mobility, hindered regional economic competitiveness, and increased various pollutants levels. Immediate transportation benefits to the community have been realized, including the elimination of an at-grade rail intersection crossing (over 130 crashes and one fatality since 2005, 11 auto-train crashes since 1978), reduced congestion and addressed operational deficiencies, reduced driver delay (431 hours/day reduction), and eliminated daily auto-train exposures (412,000 crash exposures/day). These improvements will reduce the number of crashes by reducing congestion.

In particular, this project has already made a significant impact on school bus transportation and public transit. Over **130 school buses carrying more than 2,000 students crossed the tracks daily prior to construction** and fixed-route MATBUS service has always been provided on 20th and 21st Streets, but headway reliability was poor due to the uncertain arrival of trains. Thus, with the removal of this major safety and operational barrier, the efficiency of the metropolitan transportation system has greatly improved.

Long Term

The project will improve freight flow, highway and rail operations, and community safety. With removal of the at-grade crossing, the potential for economic growth will be upgraded, environmental and safety hazards will be eliminated, emergency response times and evacuation routes will be improved, and community livability will be enhanced.

By eliminating the conflicts between automobiles, trains, trucks (many handling hazardous toxic materials), buses, bikes, and pedestrians, safety, system reliability, mobility, and connectivity has increased and delays have been reduced along arterial corridors, as well as throughout the downtown area. In addition, the project has provided relief for operational issues in the sub-area surrounding the project as trains can reach the BNSF Rail Yard and freight transfer point without causing blockage at heavy-traffic, at-grade crossings in downtown Moorhead. Environmental benefits will be realized by reduced energy consumption and improved air quality because the long and frequent vehicle queues at the blocked rail crossings have been decreased. Finally, the project provides substantial transportation circulation benefits to the two adjoining National Highway System (NHS) routes (US 10 and I-94), as SE Main Avenue is the designated I-94 Business Loop connecting these nationally significant roadways.

Intermittent Red River Valley flooding also factors into the importance of this project. SE Main Avenue is a designated evacuation route for local and Fargo residents during major flooding events and these improvements impact flood operations in the surrounding metro area.

Transportation System Infrastructure Improvements

This project provides significant benefits to the regional and national transportation infrastructure system by providing substantial emergency response/evacuation, safety, freight, and economic development benefits:

1 SE Main Avenue serves as the metropolitan connection between I-94 and US 10 and is designated as the I-94 Business Loop. By eliminating the congestion caused by trains blocking that significant route, over 431 hours of driver delay a day or 2.5 million hours of delay between 2022 and 2038 can be eliminated.

2 The wye eliminates the need for freight trains to use the mainline to back into the BNSF Rail Yard to east, thereby freeing up a significant amount of mainline capacity, estimated at 2.5 hours/day or 912 hours/year or about 10 percent of mainline time. This is important considering the increasing demand of the mainline to accommodate agricultural products and the movement of oil and coal from western North Dakota.

3 The project rehabilitated, reconstructed, or upgraded poor infrastructure that threatened future economic growth and stability. An important aim of the project was to upgrade the existing transportation system to address poor operations, unsafe conditions, auto-train conflicts, and connectivity barriers. As traffic and train volumes increase, so too have auto-train exposures, thereby increasing the magnitude of these safety concerns at an intersection that was already considered a high crash location.

According to US Chamber of Commerce data, freight rail volumes are expected to increase, which will mean a steady increase in local rail traffic, further raising auto-train exposure levels. This situation affects economic stability, as existing businesses located near that crossing could have chosen to relocate to a more reliable transportation network.

4 The project improves long-term efficiency, reliability, and cost-competitiveness in the movement of workers or goods. Fargo-Moorhead functions as the growth center for the bi-state region and is a major junction between east/west and north/south freight routes. However, transportation system constraints, especially rail barriers, were beginning to affect the area's ability to sustain economic growth. The rail freight benefits are significant, as the wye eliminates the need for freight trains to use the mainline to back into the BNSF Rail Yard. In addition, local truck freight flow was also affected by train blockage at SE Main Avenue and the movement of various agricultural products, especially sugar beets, via trucks from field to processing or transshipment points was often disrupted by trains. The project, especially the rail grade separation and the wye, eliminated current freight impediments and improves freight circulation and safety on these critical routes.

Innovative Construction

Critical Path Method (CPM)

The project required a CPM schedule that the project management team used to help identify and manage risks, saved time, and assisted in the successful management of project deadlines. CPM scheduling allowed for clear and transparent management of the project's critical activities to help limit delays and stay on budget. By visualizing and presenting the projects in a clear graphical form, the CPM schedule defined the most important and critical activities. CPM identified days where it is was possible to spend extra time on non-critical elements of the overall project and be efficient during unforeseen delays that allowed for other work areas to be finished on time without affecting other work.

Weekly Construction Meetings

Holding weekly construction meetings served many important purposes. They allowed for discussion and coordination of upcoming project activities, but also provided an opportunity for all stakeholders to discuss project changes, safety concerns, and traffic management. Construction meetings facilitated discussions of issues that could affect project costs or schedule, such as supply/shipping delays and material markups. The contractor used the meetings to raise value engineering (VE) issues and determine whether other parties would even consider VE proposals before spending time on the issue. The project management team announced design or parameter changes, sometimes before project plans were updated, allowing all parties additional time to review how the changes would affect the balance of the project.

Safety

Construction Safety

- Daily/weekly safety meetings for field staff covered a variety of safety topics including suicide awareness and prevention, proper use of tools and equipment, heat exhaustion, among others.
- Dedicated "Project Safety Weeks/Months" emphasized and encouraged proper safety training and techniques.
- During the 2020 pandemic a COVID Response Plan was developed and implemented that was used to document identification and mitigation measures taken, including all engineering controls, administrative controls, and safe work practices. It was updated on a regular basis for the duration of the COVID-19 pandemic.

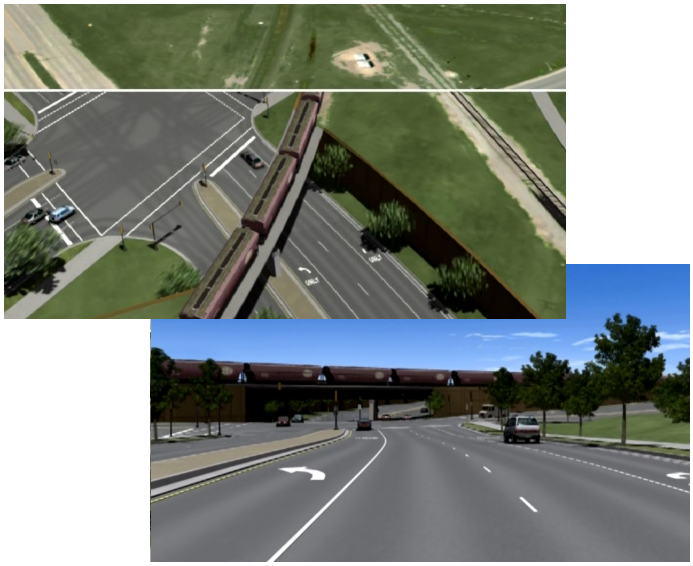
Design Safety

- During the design and planning stages, having a safe way to effectively move vehicles, pedestrians, and goods through the work zone was a top priority for the project team.
- A temporary roundabout was installed in an adjacent residential neighborhood to slow down vehicles and ease congestion, especially for traffic coming to and from the high school adjacent to the project.

Community Relations & Public Engagement

The city led public engagement efforts for the project, utilizing a project website, email blasts, social media, and press releases to disseminate information to the community. Several public open houses were also held throughout the preliminary and final design stages of the project and during construction.

The City's project website was the source of the most current and live project information, especially during construction. Visualizations were especially effective in demonstrating clearly and accurately what drivers can expect to experience prior to and during construction.



There were two critical elements of coordination during construction:

- With the city's only public high school located immediately adjacent to the project, close coordination with the school district was crucial to address changes in traffic control. School representatives were invited to the weekly construction meetings to discuss concerns and get the most up-to-date information to share with their teachers and students. That line of communication was crucial when the high school undertook a renovation project in 2021 as traffic patterns in and around the school had to be modified.
- It was imperative that BNSF traffic remain live during all stages of construction. Project staff maintained close contact with BNSF frequently to reduce disruptions to the movement of rail freight.

In July 2022 the whole community was invited to a grand ribbon-cutting celebration at the site of the underpass prior to it opening that included food, music, and comments by local and state officials and project personnel.

Resiliency, Sustainability, and Environmental Considerations

Environmental Goals

- **Improve energy efficiency, reduce oil dependence, and reduce greenhouse gas emissions**

  The primary objectives of this project were to remove the at-grade railroad crossings at the skewed intersection of SE Main Avenue and 20th/21st Street and construct a wye rail connection to improve traffic and freight rail operations. In addition to causing safety concerns, the prior roadway/railroad configuration had a negative impact on traffic operations and caused excessive fuel consumption and greenhouse gas emissions as long queues of vehicles idled at crossings when trains blocked the roadways (approximately three hours/day).

  The grade-separated underpass and wye connection significantly reduce vehicle delay. Based on the findings from the benefit-cost analysis, the grade-separation could reduce weekday vehicle delay in Moorhead by as much as 2.5 million hours over the next 10 years. The EA/EAW documented the positive impact of the project: "If the proposed grade separation and railroad wye construction were built by year 2020, the overall network travel time (VHT during the pm peak hour) will be improved by 196 hours from existing year 2004 conditions, or 271 hours of improvement compared with year 2020 No-Build conditions." By reducing vehicle delay, excessive idling, and corridor congestion, the project substantially reduces system-wide fuel consumption.

  The EA/EAW also indicated that carbon monoxide levels could be substantially reduced by the project. It found CO levels would drop approximately 10 percent (from no-build to build alternative) based on eight-hour estimates. In addition, vehicle idling and corridor congestion are also significant contributors to poor air quality and pollutant emissions (CO2, NOX, and VOC) generated during periods of idling may be significantly reduced by the project.

  Improved train operations (e.g., no need to back into the rail yard) also reduces emissions from heavy diesel-engine freight trains, such as particulate matter (PM), which has considerable respiratory implications for humans.

- **Maintain, protect, or enhance the environment**

  MnDOT and FHWA approved the EA/EAW and FONSI in 2007. As part of this process, a detailed evaluation of social, economic, and environmental impacts was conducted in accordance with federal NEPA rules and regulations. Potential environmental impacts were identified, and the preferred alternative was designed to either avoid or mitigate any environmental impacts associated with the proposed project.

Unique Characteristics and Impacts

The project's significance is even more pronounced during major Red River flooding events, similar to those that occurred in 2009, 2010, and 2011. SE Main Avenue and 20th Street played two significant roles during recent major flood fights. First, during the 2009 flood crisis, when all bridges across the Red River except Main Avenue and I-94 were closed, any metro-wide evacuation (which was seriously discussed by the City of Fargo and FEMA officials) would have used SE Main Avenue. Fargo (2012 population of 109,7791) residents west of the Red River would need to utilize this roadway, as flooding is even more severe on the North Dakota side. The MPO has designated SE Main Avenue as a Regional Significant Transportation Infrastructure (RSTI) partly for this reason.

In the past, 20th Street and SE Main Avenue have also served as major arterials connecting sandbag production facilities and affected riverfront properties. "Just-in-time" delivery of sandbags to flooded sites have been vital in saving the two cities, and train delays at the SE Main intersection disrupted or slowed down the timely installation of these protective measures.

Extraordinary Accomplishments

The initial project plan set was completed to 95% in 2009 and 100% completed in 2018. During that time there were updated design and construction standards that required design changes, such as concrete pavement design, storm sewer pipe and drainage structure sizing, and bridge and retaining wall design.

In 2010, the Americans with Disabilities Act (ADA) established the design requirements for facilities including curb ramps and sidewalk in private and public sectors with the implementation of the American with Disabilities Act Accessibility Guidelines (ADAAG). This led to geometric changes to the proposed curb ramps to be fully compliant with these new guidelines.

There were also upgrades to CADD software and programs that provided additional challenges for the design team. The team was unfamiliar with the software used in the 95% plans but the project team was able to learn on the fly in order to meet the project schedule.

During design, it was determined that petroleum-impacted soil and groundwater were likely to be encountered during construction that would impact construction activities. Further investigation was done by environmental borings and sampling along with review of historical records to determine the approximate limits and quantity of contaminated material likely to be encountered. During construction, 21,500 cubic yards of contaminated soil were encountered in total.

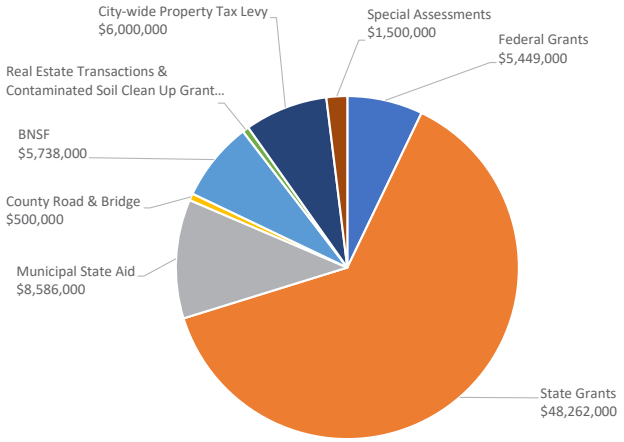
Fortunately, a disposal plan had been developed during design to handle contaminated material, including the hauling and disposal of the material at a certified landfill. The plan included hauling the contaminated material offsite and being handled (farmed) to reduce the containment level and allow for 80% reuse of the material. The plan also included protections to prevent surface discharge of contaminated groundwater.

Additional Considerations

Value Engineering

After bid-letting, the City met with the project management team and the contractor to discuss potential opportunities for additional cost savings. These value engineering (VE) meetings led to design changes to the proposed shoofly (temporary railroad track) and staging changes that allowed for more efficient construction operations, minimized disruptions to the active railroad, and provided a safer work zone. Additional design changes included lift station material substitution, reduced turn lane lengths, and a revised roadway section. These design/project changes resulted in $1.697 million in savings to the project.

Innovative Project Financing



During the 2017 legislative session, Governor Mark Dayton included the project in the Infrastructure Bill brought to the Minnesota House and Senate. The City was ultimately awarded $42.262 million in bonding money from the State. Still facing a budget shortage, the City was awarded an additional $6 million in additional bonding money that was able to finally get the wheels moving for this safety improvement project.

Multi-Agency Coordination and Participation

MOORHEAD MINNESOTA

MOORHEAD PUBLIC SERVICE

DEPARTMENT OF TRANSPORTATION

BNSF RAILWAY

OTTER TAIL VALLEY OTVR

Reason for Nomination

The level of planning, coordination, and communication required throughout the life of this project was incredibly complex. The City of Moorhead and Moorhead Public Service did an outstanding job of navigating various challenges before and during construction and managed to keep the community engaged, which is key to the success of any public works project.