Grand Forks Mill Spur Feasibility Study

Grand Forks and East Grand Forks MPO

FINAL REPORT

August 2010

SRF Consulting Group, Inc.
Engineers | Planners | Designers

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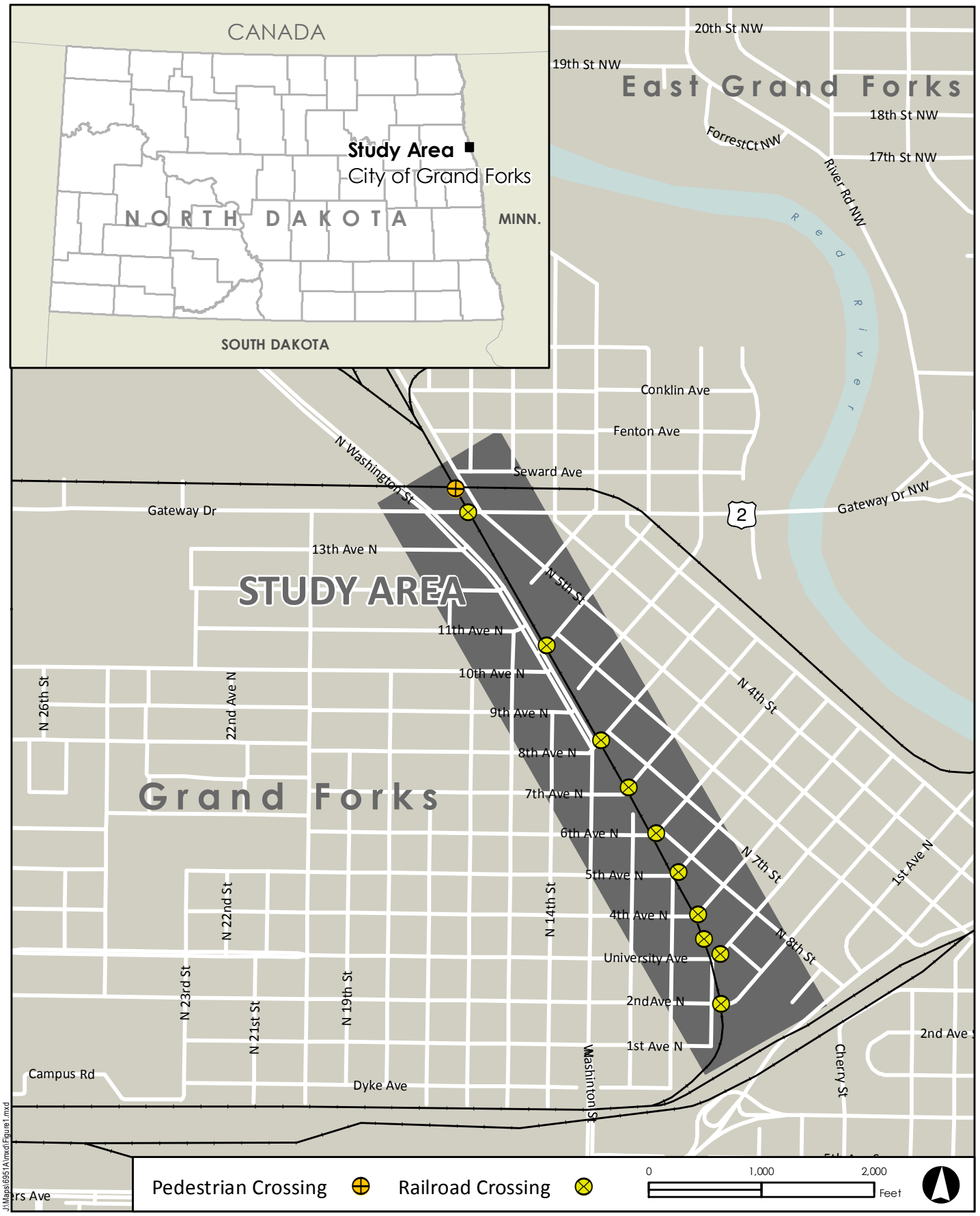
Chapter 1: Introduction and Background

The Grand Forks/East Grand Forks Metropolitan Planning Organization (GF/EGF MPO) retained SRF Consulting Group, Inc. to conduct a feasibility study of the Mill Spur rail line from 2nd Avenue North to Gateway Drive (US Highway 2). The study corridor is shown in Figure 1. The Mill Spur rail line currently handles two trains per day transporting goods from the Grand Forks Rail Yard to the North Dakota Mill. This study includes ten vehicle crossings and one pedestrian only crossing of the Mill Spur rail line. The crossings from south to north that were reviewed as part of this study include:

- 2nd Avenue North
- University Avenue
- Public Alley Crossing (Between University and 4th Avenue)
- 4th Avenue North
- 5th Avenue North
- 6th Avenue North
- 7th Avenue North
- 8th Avenue North
- 10th Avenue North
- Gateway Drive
- Multi Use Trail (Just north of Gateway Drive)

The purpose of this study is to identify railroad crossing improvements to improve the overall safety and aesthetics of the corridor, improve traffic operations, and plan for improvements that would accommodate a future train whistle quiet zone. Of the ten vehicle crossings, none have vehicle gates, and train detection is only present at the Gateway Drive crossing. It is unusual for this many unprotected crossings to exist in a neighborhood; however, the lack of active warning devices at rail crossings has not been problematic, because of low train and vehicle volumes. One of the driving factors for this study is the potential of increased train lengths and frequency to meet the North Dakota Mill's increasing needs. In addition, the Mill Spur rail line also bisects school boundaries, truck and bus routes, and is frequently crossed by emergency responders.

This study identifies existing conditions and safety issues along the corridor, alternative improvements that were developed for the railroad corridor and crossings, potential impacts and preliminary costs for the various improvement alternatives, a preferred improvement for each crossing and corridor segment, and a plan to implement the improvements over time. Further, it was also noted that the length and frequency of trains along this corridor is anticipated to increase. This, along with the potential for trains traveling through the neighborhood at night and the associated train horn noise may become problematic for the neighborhood. In order to address these issues, the minimum requirements at each crossing that would be needed to implement a future whistle free quiet zone were also identified as part of this study.



SRF Consulting Group, Inc.

Study Area

Grand Forks Mill Spur Feasibility Study

Grand Forks-East Grand Forks MPO

Figure 1

Chapter 2: Existing Conditions and Issues Identification

The existing conditions and issues for the rail corridor were identified through an examination of crossing inventory data; accident history data; field review meetings; agency input; study review committee (SRC) meetings; neighborhood committee (NC) meetings; public input meetings (PIM); review of truck, school, pedestrian, bicycle, bus, fire, and police routes; and technical analysis. The existing conditions and issues that were identified served as the basis for developing alternatives and potential impacts from the alternatives. In particular issues were identified for the potential of closing crossings as a safety improvement. A series of figures identifying access issues at each of the crossings is included in Appendix A.

2.1 Existing Railroad/Roadway characteristics

There are currently two trains per day traveling on the Mill Spur rail line, between the Grand Forks Rail Yard to the North Dakota Mill. The rail line crosses 10 vehicle crossings and one multi-use trail crossing within the study area. Typical train speeds along the Mill Spur rail line through the study area vary between one and 10 mph. The land use along the Mill Spur rail corridor is predominately residential in nature between 2nd Avenue North and 8th Avenue North and Commercial/Industrial from 8th Avenue North to Gateway Drive. Second Avenue North and Eighth Avenue North are both classified as collector roadways, University Avenue is classified as a minor arterial, Gateway Drive is classified as a principal arterial, and the remaining crossing streets are all classified as local streets. Table 1 identifies each of the rail crossings, the average daily traffic (ADT) volumes at each, the number of traffic lanes, and the existing crossing control/safety features at each crossing. Appendix B includes the United States Department of Transportation (US DOT) inventories for each crossing.

Table 1: Existing Crossing Data

US DOT Crossing Number	Street Name	Vehicle Gates (Yes/No)	Average Daily Traffic (Year)	Number of Traffic Lanes	Train Detection
081286S	2nd Avenue North	No	1,100 (2005)*	2	None
081287Y	University Avenue	No	5,600 (2005)*	2	None
081288F	Public Alley Crossing	No	50 (1988)*	2	None
081289M	4th Avenue North	No	500 (2009)**	2	None
081290G	5th Avenue North	No	700 (2005)*	2	None
081291N	6th Avenue North	No	820 (2009)**	2	None
081292V	7th Avenue North	No	510 (2009)**	2	None
081293C	8th Avenue North	No	2,100 (2005)*	2	None
081295R	10th Avenue North	No	1,825 (2005)	2	None
081297E	Gateway Drive US Highway 2	No	21,115 (2008)*	4	DC/AFO

* Traffic Count Data from FRA Inventory Forms

** Traffic Count Data from 2009 Turning Movement Counts. Peak Hour assumed to be 10% of ADT.

2.2 Existing Access Issues

During the field review it was noted that many of the crossings have driveways or street access located within 100 feet of the crossing. This creates a crossing safety issue and limits potential for possible safety measures, such as two quadrant vehicle gates with non-traversable medians. According to the Federal Railroad Administration (FRA), the standard length for a median is 100 feet. There are exceptions to reduce the median length if there is an intersecting roadway within close proximity to the crossing. If an existing roadway access point falls within the length of a proposed median, vehicle movements would be limited to right-in/right-out only. This creates a situation where vehicles may be tempted to travel in the wrong direction on the roadway, around the median, in order to make left-turn movements or to weave through vehicle gate arms when they are down. The potential access issues identified at each crossing are listed below:

2nd Avenue North: North 10th Street is located approximately 65 feet west of the tracks. Two business accesses are located approximately 20 feet east of the tracks on both sides of 2nd Avenue North (Figure 1, Appendix A).

University Avenue: North 10th Street is located approximately 80 feet southwest of the tracks and forms a skewed intersection with University Avenue. There is a driveway access immediately west of the crossing (Figure 2, Appendix A).

Public Alley Crossing (Between University and 4th Avenue): This crossing serves as a connection between the business (Dick Walsh Construction) on the east and west sides of the railroad tracks. There is a public roadway and a driveway serving a private business on the east side of the crossing, and a public alleyway and private parking lot immediately west of the crossing. In addition, there is a building immediately adjacent to the tracks in the northeast quadrant of the crossing, which limits sight lines (Figure 2, Appendix A).

4th Avenue North: There are alleyways immediately adjacent to the tracks at the northeast and southwest quadrants of the crossing, with no curb or landscaping between them. Garages for residential homes face the alleyway on the northeast side of the tracks. A business is using the alley as a roadway access on the southwest side of the tracks. A driveway is located approximately 50 feet southwest of the tracks. In addition, the curb line on the south side of 4th Avenue North, east of the crossing is damaged and worn (Figure 3, Appendix A).

5th Avenue North: An alleyway is immediately adjacent to both sides of the tracks with no curb or landscaping between them. Garages for residential homes face the alleyway on both sides of the tracks. 11th Street North is located approximately 50 feet southwest of the tracks and forms a skewed intersection with 5th Avenue North. A residential driveway is located approximately 35 feet northeast of the tracks on the south side of 5th Avenue North (Figure 4, Appendix A).

6th Avenue North: An alleyway is immediately adjacent to the west side of the tracks with no curb or landscaping between them. Garages for residential homes face the alleyway. A public street is located approximately 40 feet east of the tracks on the south side of 6th Avenue North (Figure 5, Appendix A).

7th Avenue North: An alleyway is immediately adjacent to both sides of the tracks with no curb or landscaping between them. Garages for residential homes face the alleyways. A residential driveway is located approximately 80 feet west of the tracks on the south side of 7th Avenue North. A commercial driveway and public street are located approximately 60 feet east of the tracks. In addition, the curbs on both sides of 7th Avenue North, east of the crossing, are worn and damaged (Figure 6, Appendix A).

8th Avenue North: An alleyway is immediately adjacent to the east side of the tracks with no curb or landscaping between them. Washington Street is located approximately 60 feet west of the tracks. An additional alley access and a public street are both located approximately 80 feet east of the tracks. In addition, the curbs on both sides of 8th Avenue North, east of the crossing, are worn and damaged (Figure 7, Appendix A).

10th Avenue North: Washington Street is located approximately 40 feet west of the tracks. A driveway access is located approximately 40 feet east of the tracks on the south side of 10th Avenue North. In addition, the curb on both sides of 10th Avenue North, east of the crossing, are worn and damaged (Figure 8, Appendix A).

Gateway Drive: An alleyway is immediately adjacent to the east side of the tracks with no curb or landscaping between them. Mill Road is located approximately 50 feet east of the tracks and is skewed to Gateway Drive. The free southbound to westbound right turn lane on Mill Road creates a safety issue because it is not protected by the signal. The current railroad cantilever and lights at the crossing are being blocked by a traffic signal in the westbound direction of the Gateway Drive and Mill Road intersection. Washington Street is located approximately 230 feet west of the tracks. Both the Washington Street and Mill Road intersections with Gateway Drive are signalized and there have been issues with vehicles stopping on the tracks at this location (Figure 9, Appendix A).

2.3 Pedestrian/bicycle crossings and Safe Routes to School

It is important to consider pedestrian safety as well as vehicle safety when applying safety improvements to a railroad crossing and corridor. Pedestrian crossing facilities are present at all of the crossing locations with the exception of 10th Avenue North. At 2nd Avenue North there is a sidewalk crossing on the north side of the roadway only, and at 8th Avenue North there is a sidewalk only on the south side of the roadway. The remaining crossings (with the exception of 10th Avenue) have pedestrian sidewalks on both sides of the roadway. At most of the crossings along the corridor, the sidewalks in the area of the railroad crossing are worn or damaged, and in need of maintenance or repairs.

In addition to the sidewalks at each crossing, there is currently a trail approximately 250 feet north of the Gateway Drive (Highway 2) vehicular crossing, which crosses the Mill Spur line. This trail crossing is designated as a multi-use, off street paved path on the City of Grand Forks' 2009 Bike Map. The path was also noted as a snowmobile trail at the field review meeting. This crossing is currently signed with "stop" and "look for trains" signs on the eastbound approach of the crossing (Figure 10, Appendix A).

According to the Grand Forks Safe Routes to School Maps University Avenue, 4th Avenue North, 5th Avenue North, and 6th Avenue North are designated safe routes to school across the Mill Spur rail line. These identified safe routes serve both the St. Michaels and Winship Elementary Schools.

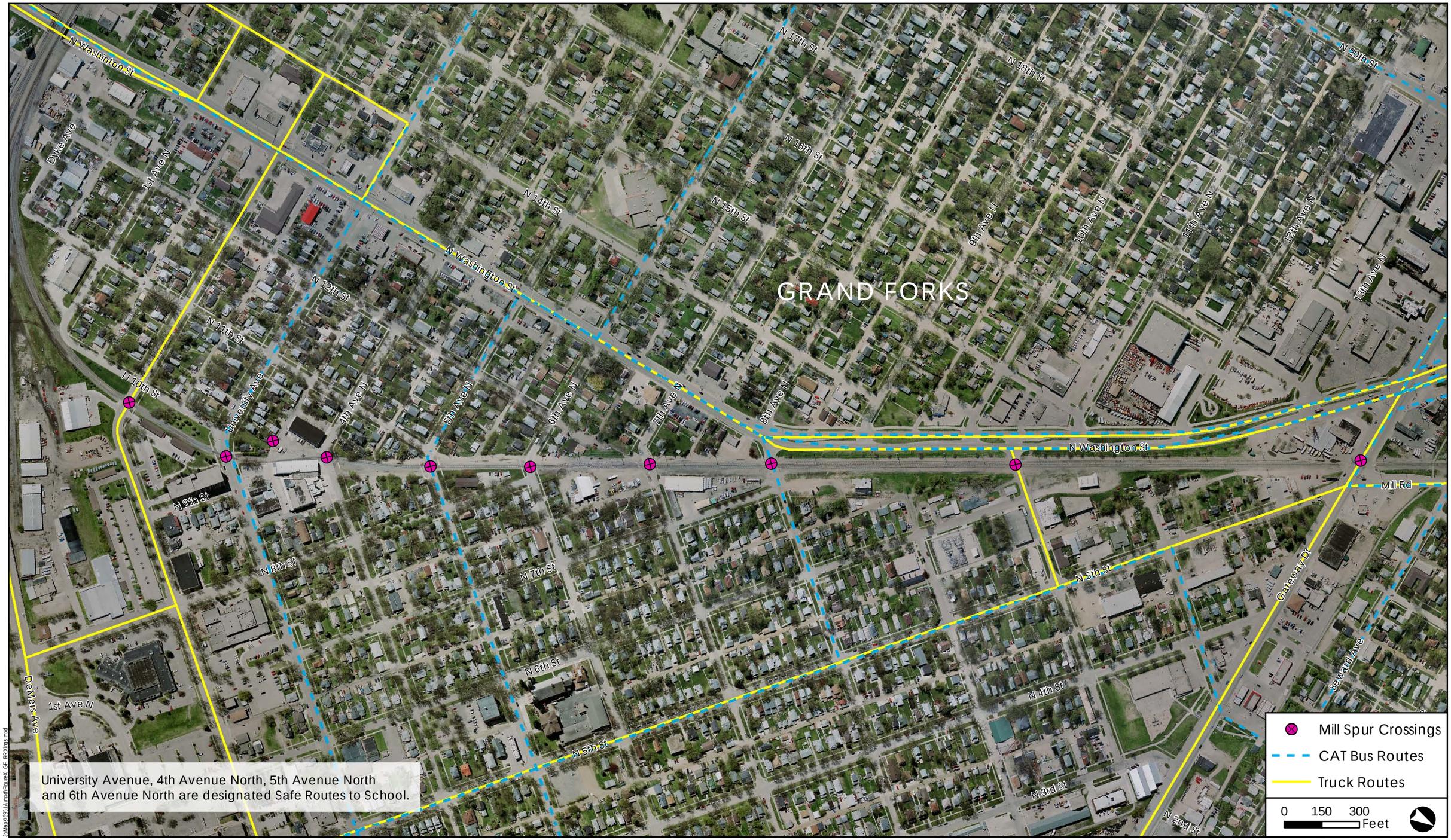
2.4 Truck, City bus, and school bus routes

Second Avenue North, 10th Avenue North, and Gateway Drive have all been identified as designated truck routes crossing the Mill Spur rail line. Both Washington Street and Mill Road which parallel the Mill Spur rail line are also designated truck routes.

The local transit service, know as Cities Area Transit (CAT) has designated transit bus routes at University Avenue, 5th Avenue North, 8th Avenue North, and Gateway Drive across the Mill Spur rail line. These include CAT Routes two, four, and six. Figure 2 illustrates the designated truck and bus routes within the study area. In addition, buses serving the St. Michaels Elementary, Winship Elementary, Wilder Elementary, and Central High Schools cross the Mill Spur rail line. Buses cross at each of the public vehicle crossings identified in this study during both the morning and afternoon periods, Monday through Friday. The highest frequency of school bus crossings occurs at the Gateway Drive and 10th Avenue North crossings, as these routes are used by many buses that service Central High School.

2.5 Emergency responder routes

The Grand Forks Police and Fire departments regularly cross the Mill Spur rail line for emergency service. Both the police and fire departments have indicated that although emergency response vehicles do cross the rail line, the potential crossing closures identified by this study would not have a major impact on police and fire response times, as there are suitable alternative routes along the corridor. In the event of a closure at any of these crossings, emergency responders would need to identify alternative routes to cross the Mill Spur rail line.



Truck and Bus Routes

Grand Forks Mill Spur Feasibility Study

Grand Forks - East Grand Forks MPO

Figure 2

2.6 Crash analysis

Historically there have been very few automobile/train crashes along the Mill Spur rail line. There have been no crashes reported since 2002. Of the past crashes, none have resulted in fatalities and only one has resulted in an injury. The crossings with the highest frequency of crashes are Gateway Drive and University Avenue, with 12 and 8 crashes respectively. This may be explained by the fact that these roadways have the highest ADT volumes, resulting in the most automobile/train exposures. Table 2 summarizes the crash history of each crossing.

Table 2: Crash Analysis

DOT NUMBER	ROADWAY	CRASH HISTORY
081286S	2nd Avenue N	3 crashes total, no crashes since 1993, no fatalities or injuries (property damage crashes only)
081287Y	University Avenue	8 crashes total, no crashes since 2002, no fatalities, one injuries
081289M	4th Avenue N	2 crashes total, no crashes since 1987, no fatalities or injuries (property damage crashes only)
081290G	5th Avenue N	No crashes
081291N	6th Avenue N	1 property damage crash in 1979
081292V	7th Avenue N	2 crashes total, no crashes since 1986, no fatalities or injuries (property damage crashes only)
081293C	8th Avenue N	2 crashes total, no crashes since 1998, no fatalities or injuries (property damage crashes only)
081295R	10th Avenue N	1 property damage crash in 1984
081297E	Gateway Drive (US Highway 2)	12 crashes total, no crashes since 1994, no fatalities or injuries (property damage crashes only)

Source: FRA Highway-Rail Grade Crossing Accident Reports

2.7 Related Studies

Other studies were completed previously to and concurrently with the Mill Spur Feasibility Study. These studies include the North Neighborhood Vision Study, the Grand Forks and East Grand Forks Quiet Zone Analysis and the Bacon Road Study.

The North Neighborhood Vision Study was conducted by a neighborhood group in north Grand Forks, prior to this study. As part of a visioning exercise, the group of neighborhood resident identified the Mill Spur railroad corridor as the “ugliest” part of their neighborhood. They also identified pedestrian safety and train horn noise as key problems in this area. Improvements proposed by the group include improving pedestrian rail crossings to address handicapped accessibility, adding decorative lighting, and planting grass near the crossings where vegetation appears to have eroded away. Another improvement to pedestrian safety as identified by the neighborhood residents would be to screen the rail corridor. The committee expressed a preference for vegetative screening rather than a structured screening such as a wall or fence.

The Bacon Road study was conducted by SRF Consulting Group, Inc. concurrently with the Mill Spur study. The study was driven by three main factors: 1) the increased number of vehicles and train creates a greater concern for safety; 2) a new BNSF operating procedure that requires a 250' sight distance buffer reduces the mills rail car storage by 16 vehicles in their yard; and 3) the potential expansion of the North Dakota Mill which may result in the increase of the current number of train movements and the potential for larger unit trains to deliver grain to their facility. The Bacon Road study was being conducted to determine the effects of closing the Bacon Road across at Mill Spur rail line along with other possible alternatives. During a stakeholders meeting to identify issues for the Bacon Road Study, it was noted that the unit train could go in excess of 7,000 feet long, much longer than the existing trains traveling on the Mill Spur rail line. It was also noted at the stakeholders meeting that the unit train would arrive approximately once a week at any time of day or night. This could result in the train traveling through Mill Spur study area during peak traffic times or at night when residents are sleeping. No trains currently travel along the Mill Spur rail line at night. A technical analysis was completed to determine how a unit train would affect the crossings between 2nd Avenue North and Gateway Drive. The results of the analysis indicate that each individual crossing would be blocked for a total of 16.57 minutes or 8.67 minutes, assuming train speeds 5 mph and 10 mph respectively; all of the crossings within the Mill Spur study area would be blocked at the same time for 5.17 minutes or 2.97 minutes, respectively; and the total for a train to pass through the Mill Spur study area blocking at least one of the crossings is 27.97 minutes or 14.27 minutes respectively. Although significant improvement would be required to implement unit trains the study committee felt it was important to consider these possible impacts. A technical memorandum entitled *Mill Spur Feasibility Study – Unit Train Crossings Blocked Analysis*, dated April 2, 2010, documents this analysis and is attached in Appendix C.

The Grand Forks and East Grand Forks Quiet Zone analysis was conducted by SRF Consulting Group, Inc. concurrently with the Mill Spur study. The analysis was conducted to determine the safety improvements that would need to be implemented in order to create a 24-hour whistle free quiet zone in East Grand Forks, Downtown Grand Forks, West Grand Forks, the Glasston subdivision, and the Hillsboro subdivision. The results of this analysis do not directly affect the Mill Spur Feasibility Study. However, it is important to note that as these quiet zones are implemented within the City of Grand Forks, train horns will continue to blow at the Mill Spur rail line crossings.

Chapter 3: Public Participation Process

Public participation was a key component in the process of identifying issues and opportunities, and collecting stakeholder input on alternatives for this study. The various forms of public participation included a study review committee (SRC) that met for a field review meeting, a neighborhood committee (NC), and public input meetings (PIM).

3.1 Field Review Meeting

A field review meeting was held on October 27, 2009, with the project's SRC. The SRC included representatives from FRA, BNSF, NDDOT, GF/EGF MPO, City of Grand Forks, the Grand Forks Police Department, and SRF Consulting Group, Inc. The purpose of the field review meeting was to walk along the Mill Spur rail corridor to identify issues and potential safety improvements at the crossings and along the rail line. Prior to this study an agency field diagnostic of the Mill Spur rail line had been conducted with FRA, BNSF, NDDOT, GF/EGF MPO and the City of Grand Forks to identify safety improvements; prioritize the crossings needs for active warning systems (vehicle gates, flashers, and train detection); and identify crossings that would be candidates for crossing closures with the least impact to traffic circulation. The results of the agency field diagnostic were discussed at the Mill Spur field review. The Mill Spur field review is the only time that the SRC met as a single group. The SRC committee was invited to all future neighborhood committee and public input meetings. An agenda and meeting summary of the field review are attached to this document in Appendix D.

3.2 Neighborhood Committee

The neighborhood committee met three times during the study process. Members of the NC included representation from the Grand Forks City Council, neighborhood residents, businesses, schools, and emergency responders. The first NC meeting was held on November 19, 2009, to identify issues at the crossings and along the corridor. The second NC meeting was held on February 23, 2010. At this meeting the committee was asked to comment on the proposed crossing improvement alternatives, along with some sub alternatives that were developed to address the identified issues along the corridor. The third meeting was held on June 1, 2010, to review and make final comments on the preferred improvements that were developed for the corridor and provide comments on the draft feasibility study. The agendas, meeting summaries, and meeting material are attached to this document in Appendix E.

3.3 Public Meetings

Two public input meetings were held during the study process. The public input meetings were advertised through direct mailings to SRC and NC members, notices in the Grand Forks Herald, a notice on the project website, and a press release. The first PIM was held on February 23, 2010. The purpose of the meeting was to discuss the issues identified along the Mill Spur and collect input on the preliminary alternative(s) for safety improvements along the Mill Spur Line. The second PIM was held on June 1, 2010, to review and make final comments on the preferred improvements that were developed for the corridor and provide comments on the draft feasibility study. The meeting summaries, meeting materials, and sign in sheets are attached to this document in Appendix F.

3.4 Local government presentations

To be held at the end of the project. Include meeting minutes in Appendix G.

3.5 Project Website

The GF/EGF MPO administered a website for the project. Links for the project information were located on GF/EGF MPO main web page at http://www.theforksmpo.org/. The website was updated at various stages throughout the project identifying project issues, showing preliminary alternatives, advertising upcoming project meetings, and offering the general public a chance to comment on the project.

Chapter 4: Mill Spur Improvement Concepts

4.1 Agency Input

As discussed in Section 3.1, prior to this study an agency field diagnostic of the Mill Spur rail line had been conducted with FRA, BNSF, NDDOT, GF/EGF MPO and the City of Grand Forks. The purpose of this meeting was to identify safety improvements, prioritize the crossings needs for active warning systems (gates, flashers, and train detection), and identify crossings that would be candidates for crossing closures with the least impact to traffic circulation. Results from this early meeting indicated that the Mill Spur crossings with the public alley (between University and 4th Avenue), 4th Avenue North, 6th Avenue North, 7th Avenue North, and 10th Avenue North would make good candidates for potential crossing closures. The committee also prioritized Mill Spur crossings for installation of safety improvements including constant warning time detection, gates, and flashers as funding becomes available. The priority of safety improvements from highest to lowest priority is as follows: University Avenue, 5th Avenue North, 8th Avenue North and 2nd Avenue North. Gateway Drive was not included in this original study and therefore was not prioritized for crossing upgrades as part of the agency meeting.

It was later discussed at the field review meeting on October 27, 2009, that 10th Avenue North would not be a candidate for a crossing closure since it is part of the City's truck route system. Instead, 10th Avenue North should be added to a list for safety improvements including constant warning time, gates, and flashers.

4.2 Preliminary Safety Improvements

The preliminary safety improvement concepts for the Mill Spur corridor study area were developed based on agency input and the issues identified early in the study process (see Chapter 2). A typical crossing safety improvement recommendation is a two-quadrant railroad vehicle gates with raised medians. This safety improvement channelizes the vehicles on the correct side of the median behind the safety gate when a train is present and eliminates the ability of vehicles to weave between the gates. The raised medians will all be a minimum of eight inches in height and a minimum of two feet wide. The length of the raised medians varies by location. The desirable length of the medians is 100-feet; however, the length of the medians is often less than 100-feet in order to reduce impacts to nearby roadway access points such as intersecting streets and driveways. Installation of the raised medians often requires relocation or closure of driveways that would exist within the median, particularly if the driveway is located on the unprotected side of the median or the side of the median where there is no vehicle gate arm. On street parking will be eliminated in locations adjacent to and approaching the raised medians. The medians are recommended for safety; however, given the low volume of vehicles and trains along the Mill Spur corridor, medians may not be required for future implementation of a quiet zone.

Another typical safety improvement proposed is the installation of pedestrian mazes. The pedestrian mazes will be ADA compliant and force a bicyclist or pedestrian to look both ways down the tracks as they go through the maze before crossing. Fencing along the railroad corridor is another safety improvement that has been proposed. The purpose of fencing the rail corridor is to discourage railroad trespass and force pedestrians to cross at designated areas, and to screen

the railroad corridor from the neighborhood in an effort to aesthetically enhance the neighborhood. The fencing would be a vinyl coated fence for the first 100-feet from the crossing and would tie into either the gate arm or pedestrian mazes. After the first 100-feet, the fencing will transition into a vegetative landscape barrier. This was desired by the neighborhood to enhance the Mill Spur corridor. During a meeting with BNSF, it was noted that red or orange colored fencing or plantings should be avoided so that it does not limit the effectiveness of similar colored safety equipment. The preliminary improvement concepts for each crossing and the overall corridor are described below and are shown in Figures 3, 4 and 5.

Rails with Trails: An 8- to 10-foot wide multi-purpose trail that would run parallel to the Mill Spur Rail line was discussed during the field review meeting. The GF-EGF MPO noted that this concept, know as *Rails with Trails* has been identified as a multi-use trail for the City of Grand Forks. This concept was noted on the preliminary improvement layouts.

2nd Avenue North: Preliminary safety improvements proposed at 2nd Avenue North include installation of two-quadrant railroad vehicle gates, constant warning time, raised medians, pedestrian mazes, relocation of two driveways, and adding fencing/plantings along the railroad corridor. The raised median would be 45-feet in length on the west side of the crossing and 60-feet in length on the east side of the crossing. The relocation of the two driveways for one business and one apartment building on the east side of the crossing is to move them further east so they are not located within the 60-foot long median. The pedestrian mazes are proposed to be installed along the north side of 2nd Avenue where sidewalk currently exists. Fencing is proposed north of the crossing along the west side of the railroad corridor.

University Avenue: Preliminary safety improvements proposed at University Avenue include, installation of two-quadrant railroad vehicle gates, constant warning time, raised medians, pedestrian mazes, realignment of 10th Street North in the southwest quadrant, and adding fencing/plantings along the railroad corridor. The raised median would be 100-feet in length on the west side of the crossing and 60-feet in length on the east side of the crossing. The realignment of the 10th Street North in the southwest quadrant is to intersect the street with University Avenue at a more perpendicular angle. The addition of the median on the west side would limit turning movements at the University Avenue and 10th Street North intersection to right-in/right-out only. The pedestrian mazes are proposed to be installed along both sides of University Avenue since pedestrian facilities exist on both sides of the street. Fencing is proposed both north and south of the crossing along the west side of the railroad corridor.

Public Alley Crossing (Between University and 4th Avenue): The public alley crossing is an alleyway located between University and 4th Avenue North. The alley serves as a connection between two buildings for the Walsh Construction business. However, the crossing is open to the public. Preliminary safety improvements proposed at the public alley crossing include installation of stop signs at the crossing and the addition of curb along the parking lot in the northwest quadrant of the crossing. The purpose of the curb is to keep vehicles from driving too close to the railroad tracks at this location. A second option to close the public alley crossing was brought up during later public input meetings and is further discussed in Section 4.4 of this report.

4th Avenue North: Preliminary safety improvements proposed at 4th Avenue North include closing the roadway and pedestrian crossing, constructing a cul-de-sac on the east side of the crossing, placing curb along the west and southwest sides of the crossing, placing curb on the south side of 4th Avenue North on the east side of the crossing, and adding fencing/plantings at the crossing closure and along the corridor. A second option to keep this crossing open and implement safety improvements was brought up during later public input meetings and is further discussed in Section 4.4 of this report.

5th Avenue North: Preliminary safety improvements proposed at 5th Avenue North include, installation of two-quadrant railroad vehicle gates, constant warning time, raised medians, pedestrian mazes, placing curb along 5th Avenue, replacing sidewalk leading up to the crossing, and adding fencing/plantings along the railroad corridor. The raised median would be 40-feet in length on the west side of the crossing and 100-feet in length on the east side of the crossing. The new curb along 5th Avenue North will eliminate alley access at this crossing. It has been verified that alternative access is available for the alley traffic on both the north and south side of 5th Avenue. The pedestrian mazes are proposed to be installed along both sides of 5th Avenue since pedestrian facilities exist on both sides of the street. Fencing is proposed both north and south of the crossing along the east and west side of the railroad corridor.

6th Avenue North: Preliminary safety improvements proposed at 6th Avenue North include closing the roadway and pedestrian crossing and adding fencing/plantings along the railroad corridor.

7th Avenue North: Preliminary safety improvements proposed at 7th Avenue North include closing the roadway and pedestrian crossing and adding fencing/plantings along the railroad corridor.

STATE MILL SPUR– SEGMENT 1 CITY OF GRAND FORKS

10TH STREET NORTH
12ND AVENUE NORTH
UNIVERSITY AVENUE
4TH AVENUE NORTH
5TH AVENUE NORTH
11TH STREET NORTH
8TH STREET NORTH
DEMERS AVENUE

INSTALL 45 LF OF 8" HIGH MEDIAN
INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CWT)
INSTALL 60 LF OF 8" HIGH MEDIAN
INSTALL PED MAZE
INSTALL 100 LF OF 8" HIGH MEDIAN
15' MIN. BUFFER
INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CWT)
NOT IDEAL DRIVEWAY LOCATION, BUT ACCEPTABLE. LONG TERM GOAL TO IMPROVE AND RELOCATE DRIVEWAY.
15' MIN. BUFFER
INSTALL SIGNS
INSTALL PED MAZE
INSTALL PED MAZE
INDUSTRIAL CROSSING
INSTALL 60 LF OF 8" HIGH MEDIAN
CURB TO PREVENT VEHICLES FROM BACKING ONTO TRACKS
MAINTAIN ALLEY ACCESS
CLOSE CROSSING (INSTALL ROAD CLOSURE SIGNAGE)
10' MIN. BUFFER
INSTALL 40 LF OF 8" HIGH MEDIAN
POTENTIAL SIDEWALK REMOVAL
RELOCATE ALLEY ACCESS
INSTALL ACTIVE WARNING SY (GATES, LIGHTS, CWT)
RELOCATE ALLEY ACCESS
MAINTAIN ALLEY ACCESS
INSTALL PED MAZE
INSTALL PED MAZE
CUL-DE-SAC FOR TRUCK TURN AROUND AREA
RELOCATE ALLEY ACCESS
INSTALL 100 LF OF 8" HIGH MEDIAN

LEGEND
- PAVED ROADWAY / DRIVEWAY
- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- FENCING
- PLANTINGS
- REMOVE PAVEMENT
- REMOVE SIDEWALK
- PROPOSED PEDESTRIAN FLASHER
- PROPOSED RAILROAD GATE
- BUS ROUTE
- TRUCK ROUTE

0 50 100
scale in feet

PRELIMINARY
SUBJECT TO CHANGE

LAYOUT NOTES:

UNIVERSITY AVENUE, 4TH AVENUE NORTH, 5TH AVENUE NORTH AND 6TH AVENUE NORTH ARE DESIGNATED SAFE ROUTES TO SCHOOL.

POTENTIAL TRAIL TO BE CONSIDERED ALONG THE CORRIDOR – "RAILS WITH TRAILS".

Support\6951 GF EGF Railroad Crossing Study\Figures 042310

SRF Consulting Group, Inc.

Job # 6951
Date 04/23/10

Preliminary Improvement Concept - Segment 1

Grand Forks Mill Spur Feasibility Study
Grand Forks - East Grand Forks MPO

Figure 3

8th Avenue North: Preliminary safety improvements proposed at 8th Avenue North include installation of two-quadrant railroad vehicle gates, constant warning time, raised medians, pedestrian mazes, placing curb along 8th Avenue, replacing sidewalk leading up to the crossing, and adding fencing/plantings along the railroad corridor. The raised median would be 40-feet in length on the west side of the crossing and 45-feet in length on the east side of the crossing. The new curb along the south side of 8th Avenue North will eliminate one driveway access. However, the property has an alternative access onto 7th Street North. The pedestrian mazes are proposed to be installed on the south side of 8th Avenue since pedestrian facilities only exist along the south side of the roadway. Fencing is proposed on both the east and west side of the railroad corridor south of 8th Avenue and only on the east side of the railroad corridor north of 8th Avenue.

10th Avenue North: Preliminary safety improvements proposed at 10th Avenue North include installation of two-quadrant railroad vehicle gates, raised medians, placing curb along 10th Avenue, and adding fencing/plantings along the railroad corridor. The raised median would be 25-feet in length on the west side of the crossing and 35-feet in length on the east side of the crossing. The new curb along the south side of 10th Avenue on the east side of the crossing will eliminate one driveway access. However, the property has an alternative access onto 6th Street North. No pedestrian facilities currently exist at this crossing. However, local agencies have identified the need for adding a sidewalk along the north side of 10th Avenue North at this crossing. A sidewalk should be constructed along the north side of this crossing and should connect existing sidewalk along the west side of Washington Street down tie into existing sidewalk to the east along the north side of 10th Avenue. Pedestrian crossing material will need to be added and pedestrian mazes should be installed on the east and west side of the crossing along the north side of 10th Avenue. Fencing is proposed on the north and south side of 10th Avenue along the east side of the railroad corridor.

Gateway Drive: Preliminary safety improvements proposed at Gateway Drive include installation of two-quadrant railroad vehicle gates, constant warning time, and active pedestrian gates, raised median, placing curb along Gateway Drive, realignment of 5th Street North in the southeast quadrant of the crossing, expansion of the channelization island to accommodate gates for the southbound to westbound right turn on Mill Road, and adding fencing/plantings along the railroad corridor. The raised median would be 100-feet in length on the west side of the crossing only. There is not room for a raised median on the east side between the crossing and the intersection with Mill Road/5th Street North. The new curb along the south of 10th Avenue on the west side of the crossing will eliminate one driveway access. However, this property has an alternative access onto Washington Street. The active pedestrian gates would be placed on both sides of Gateway Drive since sidewalks currently exists along both sides of the roadway. Fencing is proposed on the south side of Gateway Drive along the east side of the railroad corridor.

Gateway Drive (Alternative): Alternative safety improvements proposed at Gateway Drive include installation of two-quadrant railroad vehicle gates, constant warning time, and active pedestrian gates, raised medians, placing curb along Gateway Drive, realignment of 5th Street North in the southeast quadrant of the crossing, removal of the channelization island at Gateway Drive and Mill Road, relocation of the traffic signal from the channelization island, expansion of

the curb in the northwest quadrant of the Gateway Drive/Mill Road intersection to accommodate vehicle gates, and adding fencing/plantings along the railroad corridor. The raised median would be 100-feet in length on the west side of the crossing and approximately 15-feet in length on the east side of the crossing. The median would be wider to accommodate railroad vehicle gates. The 15-foot long median on the east side is needed for railroad vehicle gates and will be short in order to allow truck turning movements between Gateway Drive and Mill Road. Placing a railroad vehicle gate and flashers on this island will allow for the removal of the cantilever for westbound Gateway Drive. The existing cantilever is partially covered by the existing westbound traffic signal heads. The new curb along the south of 10th Avenue on the west side of the crossing will eliminate one driveway access. However, this property has an alternative access onto Washington Street. The active pedestrian gates would be placed on both sides of Gateway Drive
since sidewalks exists along both sides of the roadway. Fencing is proposed on the south side of Gateway Drive along the east side of the railroad corridor.

Multi-use Trail (North of Gateway Drive): Preliminary safety improvements proposed at the multi-use trail crossing include installation of "Stop" and "Look for Train" signs. An alternative improvement could include installation of flashing lights. A second option to relocate the multi-use trail to utilize the pedestrian improvements at the Gateway Drive crossing was brought up during later public input meetings. Preliminary review of the alternative to relocate the multi-use trail along the north side of Gateway Drive indicates that at maximum only a 4-foot wide trail can fit in between the existing roadway and existing right of way, instead of the 8-foot width that is needed.

4.3 Impact Evaluation

The preliminary safety improvements were presented at the second NC meeting and first PIM for the study on February 23, 2010. Graphics of the preliminary improvements and an impact evaluation matrix for each crossing were presented at both meetings. The impact matrix summarizes the proposed preliminary improvements at each crossing; how the improvements affect crossing and corridor safety; and how the proposed improvements would affect public routes, traffic operations and access management. The impact matrix is shown in Table 3.

STATE MILL SPUR– SEGMENT 2 CITY OF GRAND FORKS

14TH STREET NORTH
WASHINGTON STREET
12TH STREET NORTH
5TH AVENUE NORTH
INSTALL 40 LF OF 8" HIGH MEDIAN
INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CMT)
MAINTAIN ALLEY ACCESS
15' MIN. BUFFER
CLOSE CROSSING (INSTALL ROAD CLOSURE SIGNAGE)
10' MIN. BUFFER
INSTALL PED MAZE
RELOCATE ALLEY ACCESS
20' MIN. BUFFER
MAINTAIN DRIVEWAY ACCESS
INSTALL 100 LF OF 8" HIGH MEDIAN
INSTALL 45 LF OF 8" HIGH MEDIAN
7TH STREET NORTH
6TH STREET NORTH
5TH AVENUE NORTH
6TH AVENUE NORTH
7TH AVENUE NORTH
8TH AVENUE NORTH

LEGEND
- PAVED ROADWAY / DRIVEWAY
- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- FENCING
- PLANTINGS
- REMOVE PAVEMENT
- REMOVE SIDEWALK
- PROPOSED PEDESTRIAN FLASHER
- PROPOSED RAILROAD GATE
- BUS ROUTE
- TRUCK ROUTE

0 50 100
scale in feet

PRELIMINARY
SUBJECT TO CHANGE

LAYOUT NOTES:

UNIVERSITY AVENUE, 4TH AVENUE NORTH, 5TH AVENUE NORTH AND 6TH AVENUE NORTH ARE DESIGNATED SAFE ROUTES TO SCHOOL.

POTENTIAL TRAIL TO BE CONSIDERED ALONG THE CORRIDOR – "RAILS WITH TRAILS".

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Date 04/23/10

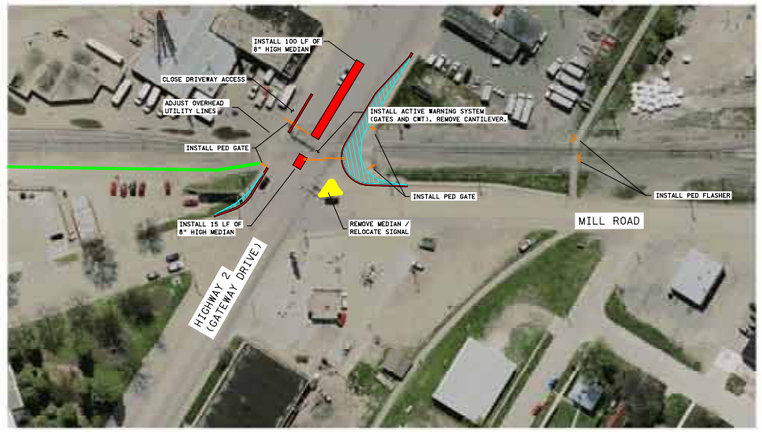
Preliminary Improvement Concept - Segment 2

Grand Forks Mill Spur Feasibility Study
Grand Forks - East Grand Forks MPO

Figure 4

STATE MILL SPUR– SEGMENT 3 CITY OF GRAND FORKS

GATEWAY DRIVE ALTERNATIVE



SEE ABOVE LEFT FOR INSET

16TH STREET NORTH

15TH STREET NORTH

WASHINGTON STREET

INSTALL 25 LF OF 8" HIGH MEDIAN

INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CWT)

CLOSE DRIVEWAY ACCESS

INSTALL 35 LF OF 8" HIGH MEDIAN – TO ACCOMODATE TRUCK TURNING MOVEMENT

10TH AVENUE NORTH

9TH AVENUE NORTH

5TH STREET NORTH

5TH STREET NORTH

INSTALL 100 LF OF 8" HIGH MEDIAN

CLOSE DRIVEWAY ACCESS

ADJUST OVERHEAD UTILITY LINES

INSTALL PED MAZE

EXISTING SIGNS

INSTALL ACTIVE WARNING SYSTEM (GATES AND CWT)

INSTALL PED MAZE

INSTALL SIGNS

EXPAND ISLAND TO ACCOMODATE 30-FT MAX. LENGTH GATE ARM

MILL ROAD

HIGHWAY 2 (GATEWAY DRIVE)

LAYOUT NOTES:

UNIVERSITY AVENUE, 4TH AVENUE NORTH, 5TH AVENUE NORTH AND 6TH AVENUE NORTH ARE DESIGNATED SAFE ROUTES TO SCHOOL.

POTENTIAL TRAIL TO BE CONSIDERED ALONG THE CORRIDOR – "RAILS WITH TRAILS".

LEGEND

- PAVED ROADWAY / DRIVEWAY
- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- FENCING
- PLANTINGS
- REMOVE PAVEMENT
- REMOVE SIDEWALK
- PROPOSED PEDESTRIAN FLASHER
- PROPOSED RAILROAD GATE
- BUS ROUTE
- TRUCK ROUTE

0 50 100
scale in feet

PRELIMINARY
SUBJECT TO CHANGE

Support\6951 GF EGF Railroad Crossing Study\Figures 042310

SRF Consulting Group, Inc.

Job # 6951
Date 04/23/10

Preliminary Improvement Concept - Segment 3

Grand Forks Mill Spur Feasibility Study
Grand Forks - East Grand Forks MPO

Figure 5

Table 3 – Proposed Improvements and Potential Impacts

Crossing	Proposed Improvements	Potential Impacts and Issues		
		Crossing and Corridor Safety	**Public Routes**	**Traffic Operations and Access Management**
2nd Avenue N	• Railroad vehicle gates • Raised medians • Pedestrian mazes • Relocate two driveways • Fencing/plantings	• Improvements will enhance crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics and discourage railroad trespass	• Improvements may impact truck movements as 2nd Avenue North is a designated truck route.	• Raised medians may limit trucks turning movements from North 10th Street to eastbound 2nd Avenue N • Two driveways east of the crossing will need to be relocated
University Avenue	• Railroad vehicle gates • Raised medians • Pedestrian mazes • Realign roadway in southwest quadrant of crossing • Fencing/plantings	• Improvements will enhance crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics and discourage railroad trespass • Existing residential driveway in northwest quadrant of crossing is a safety concern	• Improvements will enhance pedestrian safety as University Avenue is a designated "Safe Route to School" • Improvements may impact bus operations as University Avenue is a bus Route	• Raised median (west of crossing) will limit access from North 10th Street to right-in/right-out only • Raised medians (east of crossing) may limit trucks turning movements from driveway/alley east of the crossing to westbound University Avenue
Public Industrial Crossing	• Stop signs • Curbing along track (northwest of the crossing)	• Improvements will enhance crossing safety • Curbing will prevent vehicles from driving on railroad tracks	• Minimal impacts to connectivity	• Minimal impacts to traffic operations and roadway access
4th Avenue N	• Close roadway and pedestrian crossing • Cul-de-sac on east side of crossing • Curbing along track (southwest of the crossing) • Curbing on south side of 4th Ave N, east of crossing • Fencing/plantings	• Improvements will enhance crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics and discourage railroad trespass • Curbing will prevent vehicles from driving on railroad tracks	• 4th Avenue N is a designated Safe Route to School. An alternative route will need to be identified • Need to identify alternative routes for emergency responders	• Cul-de-sac east of the crossing will accommodate truck movements • Need to determine the type of closure treatment (i.e., planters, 9-button signs, jersey-barriers, etc.) • Existing traffic on 4th Avenue N (500 ADT) will need to be rerouted. This could lead to increased traffic volumes at the Public Industrial crossing, University Avenue, and 5th Avenue N crossings. University Avenue and 5th Ave N have adequate roadway capacity, but increased traffic at the industrial crossing should be discouraged.
5th Avenue N	• Railroad vehicle gates • Raised medians • Pedestrian mazes • Curbing on 5th Ave N • Fencing/plantings	• Improvements will enhance crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics, provide a buffer between the alley and railroad tracks, and discourage railroad trespass	• Improvements will enhance safety/operations for buses as 5th Avenue North is a bus route • Improvements will improve pedestrian safety as 5th Avenue North is a designated "Safe Route to School"	• Raised medians may limit trucks turning from North 11th Street to eastbound 5th Avenue North • Alley access within the crossing area will be lost. Alternative access on the west side of the crossing is available via alleys perpendicular to North 11th and 12th Street N and 4th Avenue N east of the crossing
6th Avenue N	• Close roadway and pedestrian crossing • Fencing/plantings	• Improvements will enhance crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics, provide a buffer between the alley and railroad tracks, and discourage railroad trespass	• 6th Avenue N is a designated Safe Route to School. An alternative route will need to be identified • Need to identify alternative routes for emergency responders	• Need to determine the type of closure treatment (i.e., planters, 9 button signs, jersey-barriers, etc.) • Existing traffic on 6th Avenue N (820 ADT) will need to be rerouted. This could lead to increased traffic volumes on North 8th Street and at the 5th Avenue N crossing. Both have adequate roadway capacity to accommodate this increase in traffic.
7th Avenue N	• Close roadway and pedestrian crossing • Fencing/plantings	• Improvements will enhance safety for vehicles/pedestrians • Fencings/plantings will improve corridor aesthetics, provide a buffer between the alley and railroad tracks, and discourage railroad trespass	• Need to identify alternative routes for emergency responders	• Need to determine the type of closure treatment (i.e., planters, 9 button signs, jersey-barriers, etc.) • Existing traffic on 7th Avenue N (510 ADT) will need to be rerouted. This could lead to increased traffic volumes on North 7th Street and at the 8th Avenue N crossing. Both have adequate roadway capacity to accommodate this increase in traffic.
8th Avenue	• Railroad vehicle gates • Raised medians • Pedestrian mazes • Curbing on 8th Ave N • Fencing/plantings	• Improvements will enhance crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics, provide a buffer between the alley and railroad tracks, and discourage railroad trespass	• Minimal impacts to connectivity	• Raised medians may limit trucks turning movements from North 7th Street to west bound 8th Avenue North • Driveway access in southeast quadrant of the crossing will be lost. Alternative access is available via North 7th Street
10th Avenue	• Railroad vehicle gates • Raised medians • Curbing on 10th Avenue N • Fencing/plantings	• Improvements will enhance crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics and discourage railroad trespass	• Improvements may impact truck movements as 10th Avenue North is a designated truck route	• Raised medians will be designed to accommodate truck movements (shortened ease median) • Driveway access in the southeast quadrant of the crossing will be lost. Alternative access on is available via North 6th Street
Gateway Drive	• Railroad vehicle gates • Raised median (west side of crossing only) • Active pedestrian gates • Realign roadway in southeast quadrant of crossing • Curbing on Gateway Drive • Expansion of the channelization island (to accommodate 30 foot vehicle gates) • Fencing/plantings	• Improvements will enhance crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics and discourage railroad trespass	• Improvements may impact truck movements as Gateway Drive is a designated truck route • Improvements will enhance safety/operations for buses as Gateway Drive is a bus route	• Additional railroad vehicle gate needed in order to protect vehicle movements from southbound Mill Road to westbound Gateway Drive • No raised median on east side of the crossing, in order to accommodate truck turning movements • Driveway access in the southwest quadrant of the crossing will need to be lost. Alternative access on Washington Street • Traffic signal blocking railroad cantilever/flashing lights on westbound approach needs to be adjusted
Gateway Drive (Alternative)	• Railroad vehicle gates • Raised medians (short median on east side of crossing) • Active pedestrian gates • Realign roadway in southeast quadrant of crossing • Curbing on Gateway Drive • Remove the channelization island/ relocate traffic signal • Adjust north curb line (to accommodate 30 foot vehicle gates) • Fencing/plantings	• Improvements will improve crossing safety for vehicles and pedestrians • Fencings/plantings will improve corridor aesthetics and discourage railroad trespass	• Improvements may impact truck movements as Gateway Drive is a designated truck route • Improvements will enhance safety/operations for buses as Gateway Drive is a bus route	• Raised median on east side of the crossing needed in order to accommodate railroad vehicle gates. Median will be short in order to allow truck turning movements • Driveway access in the southwest quadrant of the crossing will need to be lost. Alternative access is available on Washington Street • Traffic signal will need to be relocated
Multi-use Trail	• "Stop" and "look for train signs • Flashing lights (alternative)	• Improvements will improve crossing safety	• Designated "multi-use paved path." Improvements will accommodate pedestrians, bikes, and snowmobiles	• Minimal impacts to traffic operations and roadway access

4.4 Preferred Alternative Safety Improvements

Upon review of the preliminary proposed safety improvements for the railroad crossings and corridor and review of the potential impacts; the neighborhood committee and public agencies recommended changes to be considered as preferred alternative improvements. The preferred alternative improvement concepts include the preliminary improvement concepts as described in earlier sections, and the changes suggested upon stakeholder review. The following is an overview of the changes to the preliminary improvement concepts and the preferred improvement recommendations. The preferred alternative concepts for each crossing and the rail study corridor are shown graphically in Figures 6 through 9.

Rails with Trails: A 10-foot wide multi-use trail is proposed to be constructed along the east side of the Mill Spur corridor. The trail should go from 4th Avenue to Gateway Drive. The trail needs to be offset a minimum of 25-feet from the nearest rail. It may be possible to reduce the separation by working with BNSF. Since the trail will be separated by a fence or hedge, a smaller offset may be allowed. The trails should have pedestrian ramps at street crossings outside of the active warning devices. Crossing locations should have ADA compliant ramps at the curb returns and through medians that are constructed as part of this project.

It was noticed that between 8th Avenue North and Gateway Drive the trail parallels the multi-use trail that runs along the west side of Washington Street. It was considered to cross Washington Street further south of Gateway Drive. However, there is no protected signalized crossing of Washington Street at or north of 8th Avenue, until Gateway Drive. If one of the intersections with Washington Street between 8th Avenue and Gateway Drive becomes signalized, the trail alignment should be reconsidered to go west and connect into the trail that runs north/south along the west side of Washington Street.

2nd Avenue North: The preferred alternative for this crossing includes the preliminary improvement concepts and the following changes. The proposed changes for the 2nd Avenue North crossing include shortening the median on the east side of the crossing from 60-feet to 45-feet, reconfiguring the new proposed business driveway in the southeast quadrant of the crossing, and adding additional pavement to the parking lot for the business in the southeast quadrant of the crossing. These changes were made to accommodate truck turning movements into/out of the business parking lot and to allow the truck to turn around in the parking lot. Another proposed change for the preferred alternative includes additional fencing/plantings south of 2nd Avenue North along the west side of the railroad corridor.

University Avenue: The preferred alternative for this crossing includes the preliminary improvement concepts and the following changes. The proposed changes for the University Avenue crossing include shortening the median on the west side of the crossing from 100-feet to 40-feet. The purpose for this change is to allow full vehicle turning movements at the intersection of 10th Street North and University Avenue.

10TH STREET NORTH

2ND AVENUE NORTH

INSTALL 45 LF OF 8" HIGH MEDIAN

INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CWT)

INSTALL PED MAZE

UNIVERSITY AVENUE

INSTALL 50 LF OF 8" HIGH MEDIAN

INSTALL 35 LF OF 8" HIGH MEDIAN

15' MIN. BUFFER TO TRACKS

INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CWT)

NOT IDEAL DRIVEWAY LOCATION, BUT ACCEPTABLE. LONG TERM GOAL TO IMPROVE AND RELOCATE DRIVEWAY.

15' MIN. BUFFER TO TRACKS

INSTALL PED MAZE

CLOSE CROSSING (INSTALL ROAD CLOSURE SIGNAGE)

INSTALL 60 LF OF 8" HIGH MEDIAN

INSTALL 40 LF OF 8" HIGH MEDIAN

UNIVERSITY AVENUE

CURB TO PREVENT VEHICLES FROM BACKING ONTO TRACKS

CLOSE ALLEY ACCESS

INSTALL 40 LF OF 8" HIGH MEDIAN

INSTALL 70 LF OF 8" HIGH MEDIAN

INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CWT)

10' MIN. BUFFER TO TRACKS

CLOSE ALLEY ACCESS

INSTALL PED MAZE

INSTALL PED MAZE

RAILS WITH TRAILS

CLOSE ALLEY ACCESS

MAINTAIN ALLEY ACCESS

INSTALL PED MAZE

INSTALL 100 LF OF 8" HIGH MEDIAN

4TH AVENUE NORTH

5TH AVENUE NORTH

INSET

FINAL LOCATION TO BE DETERMINED DURING DESIGN PHASE.

15' Min

4TH AVENUE AND ALLEY IMPROVEMENTS

STATE MILL SPUR SEGMENT 1 CITY OF GRAND FORKS

0 100 200

scale in feet

LEGEND

- PAVED ROADWAY / DRIVEWAY
- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- -XC- FENCING
- PLANTINGS
- REMOVE PAVEMENT
- REMOVE SIDEWALK
- PROPOSED RAILROAD GATE

LAYOUT NOTES:

UNIVERSITY AVENUE, 4TH AVENUE NORTH, 5TH AVENUE NORTH AND 6TH AVENUE NORTH ARE DESIGNATED SAFE ROUTES TO SCHOOL.

POTENTIAL TRAIL TO BE CONSIDERED ALONG THE CORRIDOR - "RAILS WITH TRAILS."

PRELIMINARY

SUBJECT TO CHANGE

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Preferred Alternative No. 1 Safety Improvements - 2nd Avenue N, University Avenue, Alley, 4th Avenue North, & 5th Avenue North Crossings

Grand Forks Mill Spur Feasibility Study
Grand Forks - East Grand Forks MPO

Figure 6

STATE MILL SPUR SEGMENT 2 CITY OF GRAND FORKS

0 100 200

scale in feet

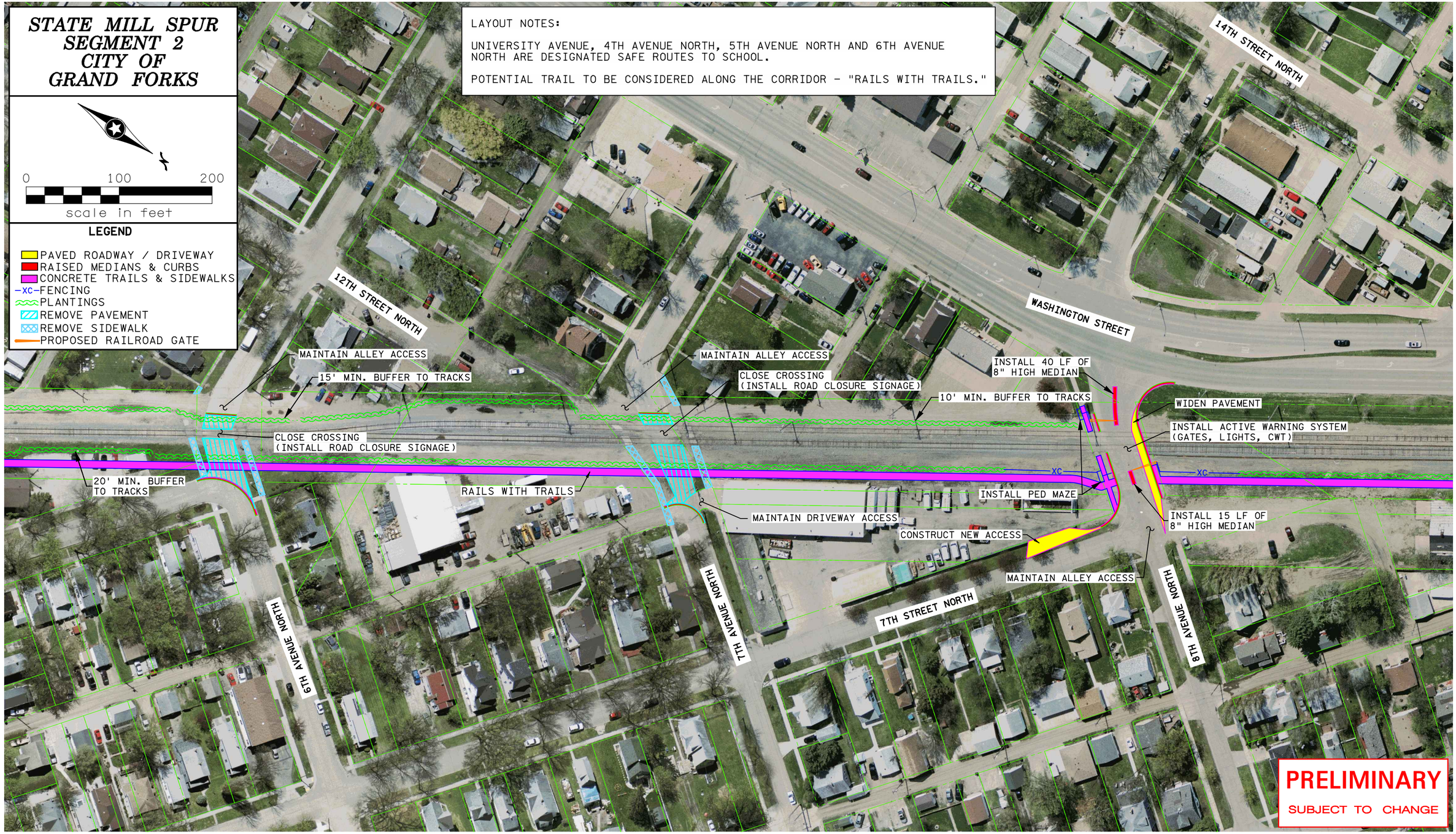
LEGEND

- PAVED ROADWAY / DRIVEWAY
- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- -XC- FENCING
- PLANTINGS
- REMOVE PAVEMENT
- REMOVE SIDEWALK
- PROPOSED RAILROAD GATE

LAYOUT NOTES:

UNIVERSITY AVENUE, 4TH AVENUE NORTH, 5TH AVENUE NORTH AND 6TH AVENUE NORTH ARE DESIGNATED SAFE ROUTES TO SCHOOL.

POTENTIAL TRAIL TO BE CONSIDERED ALONG THE CORRIDOR – "RAILS WITH TRAILS."



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6951B
7/6/2010

Preferred Alternative Safety Improvements - 6th Avenue North, 7th Avenue North, & 8th Avenue North Crossings

Grand Forks Mill Spur Feasibility Study
Grand Forks - East Grand Forks MPO

Figure 7

Public Alley Crossing (Between University and 4th Avenue) – Alternative: A preferred alternative was developed at the public alley crossing to consider closing this crossing to vehicles and pedestrians. The purpose for this alternative would be keep 4th Avenue North open to vehicles and pedestrians to better serve existing businesses on the east and west side of the rail corridor and keep 4th Avenue North open as a safe routes to school.

4th Avenue North – Alternative: A preferred alternative was developed at the 4th Avenue North crossing to install two-quadrant railroad vehicle gates, raised medians, and pedestrian mazes. The raised median would be 70-feet in length on the west side of the crossing and 40-feet in length on the east side of the crossing. This alternative goes along with the alternative to close the public alley crossing. The purpose for this alternative would be keep 4th Avenue North open to vehicles and pedestrians to better serve existing businesses on the east and west side of the rail corridor and keep 4th Avenue North open as a safe routes to school.

5th Avenue North: No changes were made to the preliminary alternative improvements at the 5th Avenue North crossing. The preferred alternative remains the same as the preliminary improvements.

6th Avenue North: No changes were made to the preliminary alternative improvements at the 6th Avenue North crossing. The preferred alternative remains the same as the preliminary improvements.

7th Avenue North: No changes were made to the preliminary alternative improvements at the 7th Avenue North crossing. The preferred alternative remains the same as the preliminary improvements.

8th Avenue North: The preferred alternative at the 8th Avenue North crossing is the same concept to install medians and two quadrant gates. However, it was brought forward at the final neighborhood committee meeting that the business just east of the rail line between 7th and 8th Avenue North needs to get trucks in and out of his property. In order to accommodate a WB-62 truck, a slip driveway was added on the north side of the Vilandre property so that trucks could enter from 7th Street North. The median on the east side of the rail line at 8th Avenue was also shortened to 15-feet in length and 8th Avenue would need to be widened to accommodate trucks turning left from 7th Street onto 8th Avenue. With these improvements a WB-62 truck can turn into the Vilandre property at its north access onto 7th Street, out of the business at it south access onto 7th Street, and back onto 8th Avenue North. Appendix I shows the WB-62 turning template at this location.

10th Avenue North: No changes were made to the preliminary alternative safety improvements at the 10th Avenue North crossing. However, it was decided that even though it was identified at meetings that pedestrians are known to cross Washington Street at the 10th Avenue location, the pedestrian crossing should not be shown as part of this study. Instead, it is indicated that a study should be completed to determine how to better accommodate pedestrians at this location. The preferred alternative remains the same as the preliminary improvements.

Gateway Drive: No changes were made to the preliminary alternatives at the Gateway Drive crossing. The preferred alternative for the crossing is the "Alternative" that was discussed for the preliminary improvements. The free right turn movement was removed from this alternative. The stop bar for the southbound vehicles on Mill Road was also moved back (further north) to accommodate eastbound left turn movements from Gateway Drive to Mill Road. The width of the median on Gateway Drive should be a minimum of 10-feet in width to house the mast arm bases. In order to still get two eastbound thru lanes and an eastbound right turn lane at the intersection of Gateway Drive and Mill Road with the 10-foot wide median, the intersection may need to be widened or shifted south. It was determined that this median could be added without widening the existing roadway, however, the travel lanes may need to be shifted through the intersection of Gateway Drive and Mill Road. Appendix I shows the WB-62 truck turning analysis.

Multi-use Trail (North of Gateway Drive): Proposed safety improvements proposed at the multi-use trail crossing include installation of "Stop" and "Look for Train" signs.

STATE MILL SPUR SEGMENT 3 CITY OF GRAND FORKS

0 100 200

scale in feet

LEGEND

- PAVED ROADWAY / DRIVEWAY
- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- -XC- FENCING
- PLANTINGS
- REMOVE PAVEMENT
- REMOVE SIDEWALK
- PROPOSED RAILROAD GATE

LAYOUT NOTES:

UNIVERSITY AVENUE, 4TH AVENUE NORTH, 5TH AVENUE NORTH AND 6TH AVENUE NORTH ARE DESIGNATED SAFE ROUTES TO SCHOOL.

POTENTIAL TRAIL TO BE CONSIDERED ALONG THE CORRIDOR - "RAILS WITH TRAILS."

Meetings indicated pedestrians are known to cross at this location. A study should be completed to determine how to better accomodate pedestrians at this crossing.

INSTALL 25 LF OF 8" HIGH MEDIAN

INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CWT)

INSTALL ACTIVE WARNING SYSTEM (GATES, LIGHTS, CWT)

XC

XC

XC

RAILS WITH TRAILS

INSTALL 15 LF OF 8" HIGH MEDIAN

CLOSE DRIVEWAY ACCESS

INSTALL 35 LF OF 8" HIGH MEDIAN - TO ACCOMODATE TRUCK TURNING MOVEMENT

8TH AVENUE NORTH

9TH AVENUE NORTH

6TH STREET NORTH

10TH AVENUE NORTH

PRELIMINARY

SUBJECT TO CHANGE

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SRF Consulting Group, Inc.

Preferred Alternative Safety Improvements - 10th Avenue North Crossing

Grand Forks Mill Spur Feasibility Study

Grand Forks - East Grand Forks MPO

6951B
7/2/2010

Figure 8

STATE MILL SPUR SEGMENT 3 CITY OF GRAND FORKS

0 100 200

scale in feet

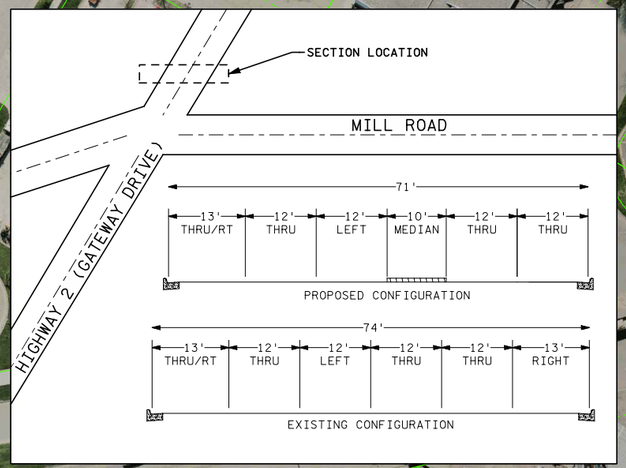
LEGEND

- PAVED ROADWAY / DRIVEWAY
- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- FENCING
- PLANTINGS
- REMOVE PAVEMENT
- REMOVE SIDEWALK
- PROPOSED RAILROAD GATE

LAYOUT NOTES:

UNIVERSITY AVENUE, 4TH AVENUE NORTH, 5TH AVENUE NORTH AND 6TH AVENUE NORTH ARE DESIGNATED SAFE ROUTES TO SCHOOL.

POTENTIAL TRAIL TO BE CONSIDERED ALONG THE CORRIDOR – "RAILS WITH TRAILS."



INSTALL 100 LF OF 8" HIGH MEDIAN

INSTALL ACTIVE WARNING SYSTEM (GATES AND CWT). REMOVE CANTILEVER.

HIGHWAY 2 (GATEWAY DRIVE)

CLOSE DRIVEWAY ACCESS

ADJUST OVERHEAD UTILITY LINES

INSTALL PED GATE

INSTALL PED GATE

RELOCATE SIGNAL

RAILS WITH TRAILS

MILL ROAD

INSTALL 15 LF OF 8" HIGH MEDIAN

REMOVE MEDIAN AND RR CANTILEVER / RELOCATE SIGNAL

INSTALL OPTIONAL NEAR SIDE SIGNAL HEAD

PRELIMINARY

SUBJECT TO CHANGE

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8/13/2010

Preferred Alternative Safety Improvements - Highway 2 (Gateway Drive) & Multi Use Trail Crossings

Grand Forks Mill Spur Feasibility Study
Grand Forks - East Grand Forks MPO

Figure 9

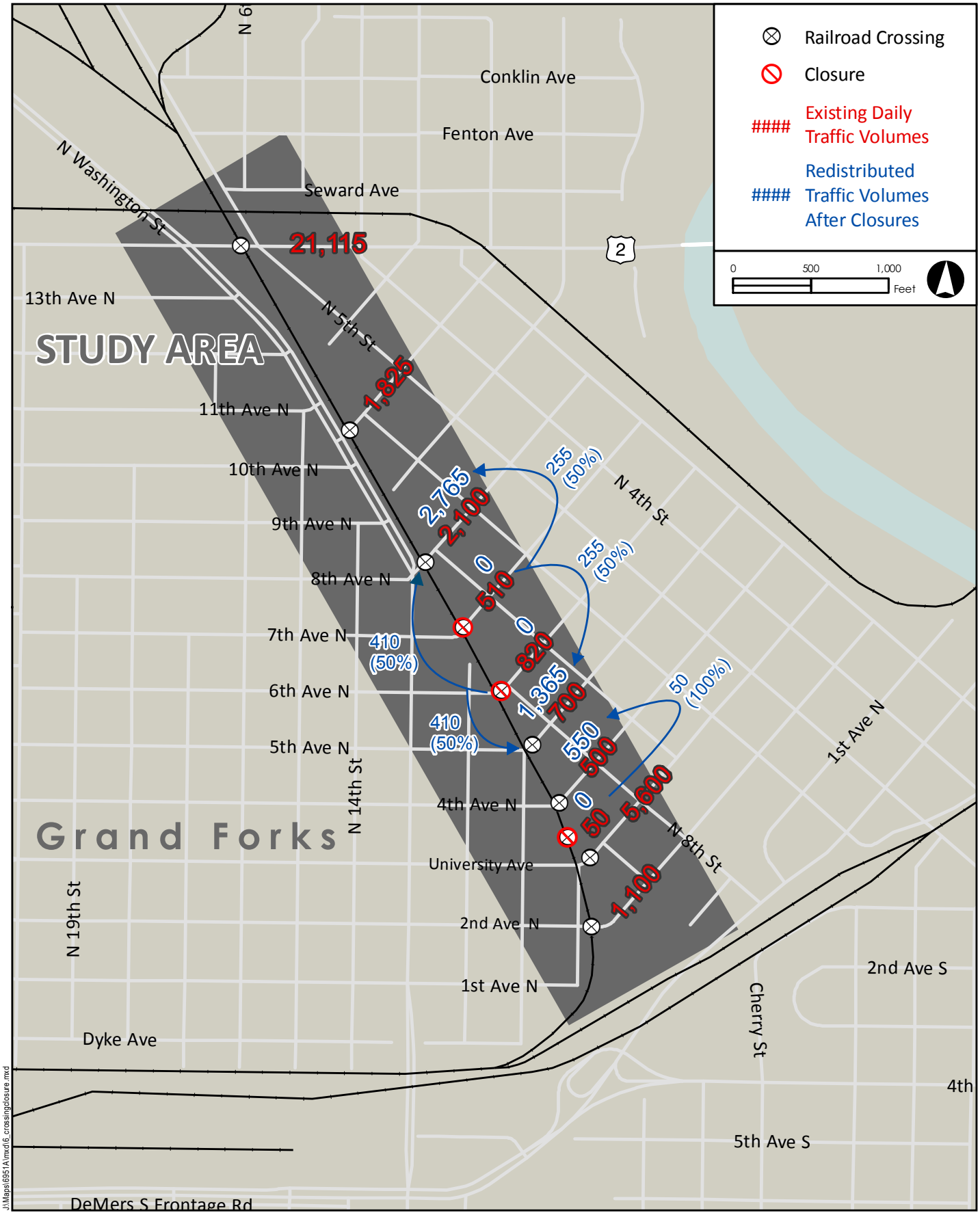
4.5 Crossing Closure Impacts

The closing of crossings to vehicles and pedestrians at the Public Alley (between University and 4th Avenue), 6th Avenue North, and 7th Avenue North crossings creates impacts to public routes, neighborhood businesses, and requires the redistribution of the traffic to other crossings. The existing traffic volumes at the crossings have adequate capacity to handle the additional traffic volumes that would result in the closure of the three crossings. The redistribution of traffic volumes due to crossing closures is illustrated in Figure 10. Emergency responders such as fire, police and ambulance will need to update their maps to identify the crossing closures identify new emergency response routes. The impacts are summarized for each proposed crossing below.

Public Alley Crossing (Between University and 4th Avenue): The main impact of closing this crossing is to the existing businesses which are located directly on the east and west side of the rail corridor between the public alley and 4th Avenue North crossings. Both businesses are currently owned by Dick Walsh (Dick Walsh Construction). A preliminary alternative showed leaving this crossing open and closing the 4th Avenue North crossing. At a neighborhood committee meeting, Mr. Walsh expressed that if one of the crossings is to be closed, he would prefer it be the public alley crossing. He felt this would have a lesser impact to his business. The current ADT volumes at this crossing are 50 vehicles per day (vpd). It was assumed that 100% of these vehicles would be redistributed to the 4th Avenue North crossing.

6th Avenue North: Closing the 6th Avenue North crossing will require the distribution of 820 vpd to other crossings within the neighborhood. The preferred alternative includes closure of the 7th Avenue North crossing, which leaves the distribution of the 820 daily trips between 5th Avenue and 8th Avenue North. It was assumed that 50% of these vehicles would redistribute to 8th Avenue and the other 50% to 5th Avenue North. School buses regular use this crossing and will need to change their routes to use either 5th Avenue or 8th Avenue North. 6th Avenue North is designated as a Safe Route to School for pedestrians. It is recommended that with the closure of this crossing, the Safe Route to School maps change their routes from crossing at 6th Avenue to crossing at 5th Avenue North where sidewalk improvements and pedestrian mazes are proposed.

7th Avenue North: Closing the 7th Avenue North crossing will require the distribution of 510 vpd to other crossings within the neighborhood. The preferred alternative includes closure of the 6th Avenue crossing, which leaves the distribution of the 510 daily trips between 5th Avenue and 8th Avenue North. It was assumed that 50% of these vehicles would redistribute to 8th Avenue North and the other 50% to 5th Avenue North. School buses regularly use this crossing and will need to change their routes to use either 5th Avenue or 8th Avenue North.



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SRF Consulting Group, Inc.

Crossing Closure Traffic Volume Distribution

Grand Forks Mill Spur Feasibility Study

Grand Forks-East Grand Forks MPO

Figure 10

4.6 Preferred Improvement Cost Estimates

Preliminary cost estimates were developed for the preferred safety improvements at the crossings and along the railroad corridor. Detailed cost estimates are included in Appendix H. A summary of the total cost estimates for the proposed improvements are shown below in Table 4.

Table 4: Preliminary Cost Estimates for Preferred Alternatives

Improved Crossing/Segment	Active Warning[1]	Medians[2]	Closures	Landscape and Fencing	Sidewalks and Ped Mazes	Rails with Trails	Total Cost[3]
2nd Ave N Crossing	$355,300	$33,030	$0	$6,100	$4,000	$0	$408,100
2nd Ave N to University Ave Segment	$0	$0	$0	$7,850	$0	$0	$9,400
University Ave Crossing	$355,300	$14,990	$0	$0	$8,000	$0	$383,900
University Ave to 4th Ave N Segment (Includes closure of Public Alley)	$0	$0	$11,800	$3,000	$0	$0	$17,800
4th Avenue North Crossing	$355,300	$14,680	$0	$0	$6,850	$0	$382,200
4th Ave N to 5th Ave N Segment	$0	$0	$0	$14,700	$0	$13,300	$33,600
5th Ave N Crossing	$355,300	$17,615	$0	$0	$12,300	$1,540	$394,100
5th Ave N to 6th Ave N Segment	$0	$0	$0	$14,150	$0	$11,855	$31,200
6th Ave N Crossing	$0	$0	$17,120	$0	$0	$2,500	$23,500
6th Ave N to 7th Ave N Segment	$0	$0	$0	$20,600	$0	$16,740	$44,800
7th Ave N Crossing	$0	$0	$16,530	$0	$0	$2,705	$23,100
7th Ave N to 8th Ave N Segment	$0	$0	$0	$19,050	$0	$17,215	$43,500
8th Ave N Crossing	$355,300	$27,138	$0	$0	$7,120	$320	$397,900
8th Ave N to 10th Ave N Segment	$0	$0	$0	$20,300	$0	$38,020	$70,000
10th Ave N Crossing	$355,300	$11,450	$0	$0	$1,550	$295	$372,300
10th Ave N to Gateway Dr Segment	$0	$0	$0	$25,850	$0	$50,770	$91,900
Gateway Drive	$415,300	$55,710	$0	$0	$3,015	$9,950	$498,800
Multi Use Trail Crossing (N of Gateway Dr)	$0	$0	$0	$0	$2,000	$0	$2,400
Total Cost[3]	**$2,554,520**	**$209,540**	**$54,540**	**$157,920**	**$53,800**	**$198,250**	**$3,228,500**

(1) Includes Vehicle Gates, Lights, Constant Warning Time, Signing and Pavement Markings, and Pedestrian Gates if they were included in the alternative.

(2) Median improvements include roadway and driveway changes needed to install medians and includes removals, milling, curb and gutter, median, new pavement, patching, traffic control, mobilization, railroad insurance, and flagging.

(3) Total cost estimate includes 20% for contingencies for everything except active warning devices. The active warning devices are a BNSF cost and contingencies are assumed to be included as part of this cost. No right of way or engineering costs were included.

Chapter 5: Conclusions and Implementation

The preferred safety improvements, impacts, and cost estimates were reviewed by the neighborhood committee and public at the final study meetings. The preferred improvement alternatives along the Mill Spur Rail corridor will greatly improve crossing and corridor safety to vehicles, pedestrians, and traffic operations; as well as improving visual aesthetics along the rail corridor. These safety improvements and visual enhancements come with an estimated price of just over $3 million. However, with the potential increase in number and size of trains along the Mill Spur Rail that bisects a neighborhood and school districts comes a greater safety risk. In order to make these safety improvements a reality, an implementation plan with identified funding sources has been included as part of this study. This implementation plan is described below.

5.1 Phasing of Proposed Improvements

Crossing Closures

All of the recommended crossing closures could be implemented as one phase. The total cost estimate to implement all of the recommended crossing closures as one project is $54,540 and would be a low cost way to reduce the number of crossings and improve safety in one project. Crossing closures may be coupled with safety improvements at the nearest crossing. If they are coupled the closure of the public alley crossing could be completed after safety improvements are completed at 4th Avenue North, closure of 6th Avenue could be completed after safety improvements are completed at 5th Avenue North, and closure of 7th Avenue could be completed after safety improvements are completed at 8th Avenue North.

Active Warning Devices, Gates, and Flashers

Based on previous agency input, daily traffic volume, and designated routs; a priority list for crossing improvements at the crossing to remain open has been developed. The priority order (highest to lowest) to install vehicle gates and constant warning time is as follows: Gateway Drive, University Avenue, 10th Avenue North, 5th Avenue North, 8th Avenue North, and 2nd Avenue North. The pedestrian gates at Gateway Drive should be installed at the same time as the vehicle gates at Gateway Drive. The total cost to implement the active warning devices at all of the recommended crossings is $2,554,520. Improvements to sidewalk and installation of pedestrian mazes should be constructed in conjunction with the active warning devices. The total cost for sidewalk improvements and installation of pedestrian mazes is $53,800.

Medians

The construction of medians can be completed as its own project or in conjunction with the installation of active warning devices. The median improvements include roadway improvements, driveway changes/closures, and curb and gutter. The total cost of all items associated with the median improvements is $209,540.

Once the improvements for closures, active warning devices, and medians are constructed, the Mill Spur rail line should meet the requirements for implementation of a quiet zone if desired.

Landscaping and Trail Improvements

The corridor fencing and landscaping improvements can be constructed under their own project or with other improvements. The fencing and landscaping improvements can be constructed

before, in conjunction with, or after other corridor improvements. However, it is important that the fencing tie into the pedestrian mazes and crossing gate arms when both portions of the project are constructed. The total cost estimate for fencing and landscaping improvements is $157,920.

The Rails with Trails multi-use trail may also be constructed before, in conjunction with, or after other corridor improvements. The total cost estimate to construct the rails with trails multi-use trail is $198,250.

5.2 Potential Funding Sources

Railroad Crossings Safety Funds: Railroad safety funds are part of the SAFETEA-LU program that allocates money to the States specifically for eliminating hazards at public highway railroad grade crossings. The funds for grade-crossing safety improvements are available at a 90-percent federal share, with the remaining 10-percent to be paid by state and/or local authorities. The federal share may amount to 100-percent for signing, pavement markings, active warning devices, the elimination of hazards, and crossing closures. The NDDOT Railroad Department maintains a list of highway/railroad crossings that need safety improvements under these funds.

Regional Road Funds: Gateway Drive, also US Highway 2, is on the Regional Road system as a Primary Regional Roadway. Safety improvements at Gateway Drive would be eligible for Regional Road Funds. The cost shares for these improvements are 80-percent federal and 20-percent state.

Urban Roads Funds: Roads that are on the functional class system are eligible for Urban Road Funds. Second Avenue North and Eighth Avenue North are both classified as collector roadways, University Avenue is classified as a minor arterial, and Gateway Drive is classified as a principal arterial. Safety improvements at these crossings would be eligible for Urban Roads Funds. The cost shares for these improvements are 80-percent federal and 20-percent local.

Highway Rail Crossing Safety and Quiet Zone Grant: North Dakota's sixty first legislature passed Senate Bill 2338 which amended the North Dakota Century Code. The amendment allocated $1.6 million highway tax distribution funds and $900,000 in federal highway traffic safety funds to be used for highway-rail grade crossing safety project. The grant allows each municipality a cumulative not to exceed amount of $225,000 with a maximum of $75,000 per crossing for highway-rail safety improvements. This project would be eligible for these grant funds. However, each city or municipality can only use these funds once. The City of Grand Forks has the option to use the grant funds to make safety improvements at other crossings with the intent to implement a quiet zone or to make safety improvements for this project along the Mil Spur rail line.

BNSF Cost Share: No commitments have been made by BNSF for funding of this project. However, BNSF has been known in the past to participate in the cost or fully fund the cost of crossing closures.

Safe Routes to School: University Avenue, 4th Avenue North, 5th Avenue North, and 6th Avenue North are designated safe routes to school across the Mill Spur rail line. Pedestrian

improvements including sidewalk or trail repairs and installation of the pedestrian mazes at these locations would be eligible for Safe Routes to School Funds. The cost share for these improvements are 100% federal with no state or local match.

Transportation Enhancement Funds: Fencing and landscaping improvements, improvements to existing trails, and the Rails with Trails 10-foot multi use trails are all improvements identified as part of this study that would be eligible for Transportation Enhancement Funds.

Community Development Block Grant (CDBG) Funds: The improvements may be eligible for CDBG Funds which are administered by the City of Grand Forks.

Others: The City of Grand Forks could decide to bond for these improvements. Bonded improvements are generally paid off by assessments, future real estate tax revenues, or sales tax.