

**US HIGHWAY 2 CORRIDOR STUDY
EAST GRAND FORKS, MINNESOTA**

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EXECUTIVE SUMMARY

The Grand Forks-East Grand Forks Metropolitan Planning Organization (MPO) has identified the need for preparing a plan that addresses the future design of the US Highway 2 corridor in East Grand Forks, Minnesota. The plan is intended to provide a guide for future improvements along the corridor that are in keeping with local needs and desires. The plan is intended to improve the economic viability of properties along the corridor while enhancing the residential character and overall travel characteristics in the community.

An aggressive public participation program was used to develop a consensus on the issues, opportunities, and constraints that exist within the corridor. These issues were developed through a series of public meetings including Citizens Review and Technical Advisory Committees, and property owner workshops.

The development of alternatives was completed using the same public participation process. Finally, the alternatives were evaluated to determine an overall preferred alternative, which is the summation of all of the individual intersections, and a vision for the corridor as a whole.

The recommended improvements are summarized below:

- *Overall Corridor*
 - » Construct to a four-lane divided urban section with access points at quarter-mile intervals to facilitate access to development north and south of US Highway 2.
 - » Construct a bike path parallel to the corridor consistent with the Grand Forks/East Grand Forks Transportation Plan Update (bicycle element).
 - » Add landscaping and street lighting east of Trunk Highway (TH) 220.
- *River Road and US Highway 2*
 - » Add signing and marking improvements.
 - » Relocate 10th Street Northwest west of River Road to the north.
 - » Add a raised median to prohibit traffic on the northeast ramp from turning north on Eighth Avenue Northwest.
 - » Add medians on River Road north and south of the interchange.
- *Fifth Avenue Northwest*
 - » Connect north and south legs of Fifth Avenue Northwest to US Highway 2.
 - » Reconfigure frontage roads to allow a minimum of 100 feet separation between the frontage roads and the highway.
 - » Install a traffic signal at intersection (a traffic signal justification study will be required).
 - » Install pavement markings and signage to assist pedestrian and bicycle traffic in crossing the highway.

- *TH 220*
 - » No improvements are recommended.
- *Third Avenue Northeast*
 - » Connect north leg of Third Avenue Northeast to US Highway 2 at roughly the halfway point between Fifth Avenue Northeast and TH 220.
 - » Modify frontage roads along north side to allow for a 100-foot minimum separation between the highway and the frontage roads at the intersection.
- *Fifth Avenue Northeast*
 - » Modify frontage roads to provide a minimum of 100-foot separation between frontage roads and US Highway 2. Modify median in conjunction with overall corridor improvements to allow smooth north/south traffic flow.
 - » Install traffic signal (a traffic signal justification study will be required).
- *Seventh Avenue Northeast*
 - » Modify frontage roads to provide a minimum of 100 feet separation between frontage roads and US Highway 2.
 - » Reconstruct median area in conjunction with overall improvements.
- *Railroad Crossing*
 - » Remove crossing.
- *11th Avenue Northeast*
 - » Modify frontage roads to provide a minimum of 100 feet separation between frontage roads and US Highway 2.
 - » Reconstruct median area in conjunction with overall improvements to allow smooth north/south traffic flow.
- *15th Avenue Northeast*
 - » Connect with US Highway 2.
 - » Modify frontage roads along south side to allow for a minimum of 150 feet separation between frontage road and US Highway 2. A greater separation is recommended because of heavy truck usage and available undeveloped property.
 - » Reconstruct median area in conjunction with overall corridor improvements to allow smooth north/south traffic flow.

The above improvements should be scheduled to be completed in two phases. The first phase would include that area west of TH 220 and the second phase would include the area east of TH 220. Both phases should be constructed under traffic to minimize impact to adjacent businesses and properties.

INTRODUCTION

Purpose

The Grand Forks-East Grand Forks Metropolitan Planning Organization (MPO) has identified the need for a comprehensive study into the future characteristics of US Highway 2 between the Red River and 15th Avenue Northeast within the city limits of East Grand Forks, Minnesota. While serving the overall transportation needs of the region, US Highway 2 is perceived as a barrier to safe and convenient north-south travel as well as access to adjacent properties. In June of 1993, the MPO retained Barton-Aschman Associates, Inc. to study the corridor and make recommendations as to future improvements that would address existing and future needs.

The purpose of this study is to prepare a plan for the citizens of East Grand Forks and the Minnesota Department of Transportation for future improvements along the corridor. This plan is intended to reflect the wishes of the citizens of East Grand Forks while also accommodating the engineering criteria governing highways of this type. This study includes a comprehensive look into the land use adjacent to the corridor, an examination of deficiencies relating to accidents, congestion, and circulation, and an inclusive public participation program. This program included several one-on-one meetings with adjacent property owners, several meetings with the Citizens Review Committee and the MPO's Technical Advisory Committee, and regular meetings with the Planning and Zoning Commission of the City of East Grand Forks.

The corridor was analyzed using an updated TRANPLAN model provided by the MPO to determine the effects the alternatives have on traffic volumes. These traffic projections were used in the analysis of the level of service along the highway to handle changes in traffic flow. This information, in addition to accident history and citizen input, was also used in the alternative development process.

Objectives

The objectives of this study are summarized as follows:

- Recommend a transportation plan for US Highway 2 in East Grand Forks that will enhance transportation, economic vitality, and the overall character of the corridor within the city.
- Develop a plan for US Highway 2 that addresses circulation, safety, and congestion deficiencies along the corridor.
- Conduct an inclusive and comprehensive program to ensure public participation.
- Identify the costs and benefits associated with each alternative.
- Rank alternatives according to subjective and objective criteria.

Report Organization

The intent of this report is to document the major aspects of the study activities. The study begins with a look at the existing conditions including street network, traffic control devices, traffic volumes, and accident history. The initial efforts included establishing issues, opportunities, and constraints along the corridor with the help of advisory committees, staff, and the citizens of East Grand Forks. Alternatives were then developed to address the established issues.

The alternatives were evaluated based upon criteria developed during the early stages of the study. The evaluation criteria included impact to adjacent property, costs, improved safety, reduced congestion, and overall circulation. From this analysis, improvements were recommended for the entire corridor and individual intersections. A schedule is provided that establishes the priority and phasing of improvements.

The new St. Hillaire Grain Elevator is an aspect of the study that occurred subsequent to its beginning. The elevator is expected to be located east of the intersection of 15th Avenue Northeast and 10th Street Northeast. This elevator will attract a significant amount of traffic, which will include straight trucks, semi-trucks, and passenger vehicles. Included in the study is an examination of rail traffic and its impact on the surrounding street system.

EXISTING CONDITIONS

Street Network

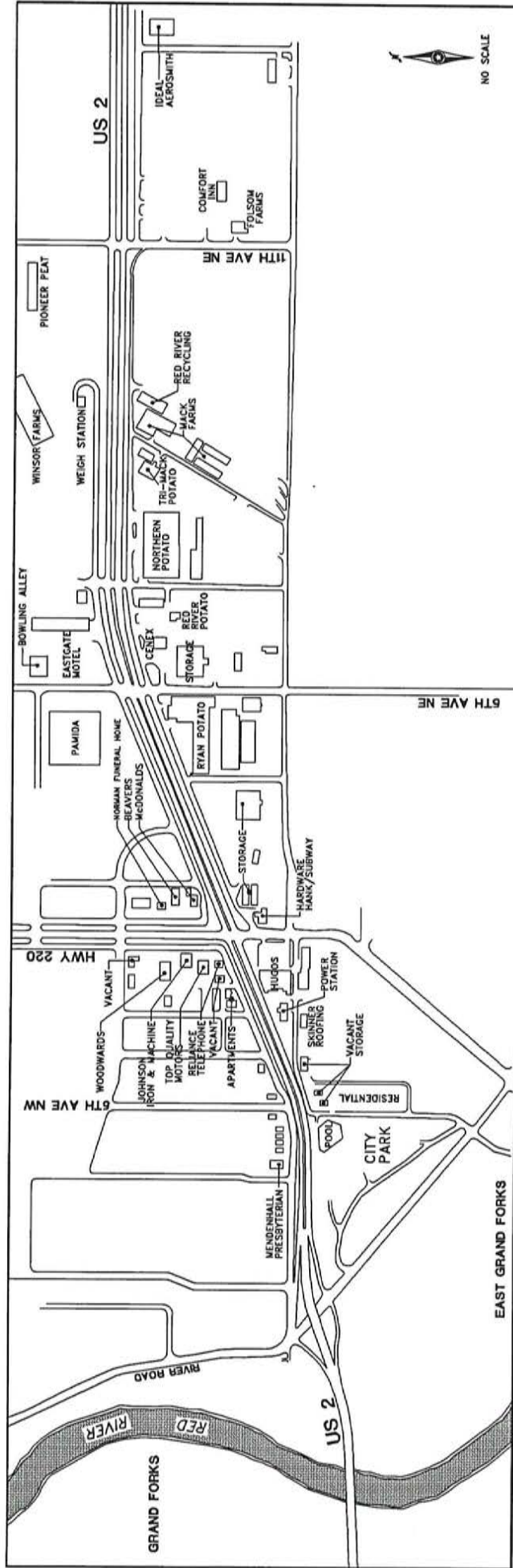
The street system surrounding US Highway 2 in East Grand Forks is a combination of local, collector, and arterial streets that serve regional, subregional, and local travel demands. US Highway 2 is currently access controlled with direct access by way of public streets with spacing ranging between one-quarter mile and one-half mile intervals. The major cross street that intersects US Highway 2 is Trunk Highway (TH) 220. This highway is four-lane divided in the vicinity of US Highway 2 and carries equal to or greater traffic volumes. Other important intersecting streets are River Road and Fifth Avenue Northeast. River Road is considered a minor arterial and Fifth Avenue Northeast a collector street in the city's functional transportation plan. Figure 1 provides an overview of the existing street network and Figure 2 is an illustration of the functional classifications of the major streets. Figure 3 provides an illustration of the existing typical sections along US Highway 2.

Figure 4 is an illustration of the existing traffic signal and warning flasher locations. TH 220 is the only intersection that is controlled by a traffic signal along the route. River Road intersects US Highway 2 with an interchange. The US Highway 2 ramp terminals are controlled with stop signs. Fifth Avenue Northeast is also controlled with stop signs. The other two intersections with direct access are Seventh Avenue Northeast and 11th Avenue Northeast. Again, both locations are controlled with stop signs only.

As part of this study, the MPO conducted traffic counts at all key intersections along the corridor. Sixteen-hour traffic counts were taken including the morning and evening peak hours. This information was converted to average annual daily traffic for the connecting links by applying seasonal factors obtained from MnDOT Traffic Forecasting Division. This has been found to provide fairly accurate results to estimate average daily traffic. The turning movement counts and estimated average annual daily traffic (AADT) are provided on Figures 5 and 6 respectively.

Accidents along the corridor were determined by examining records provided by the Minnesota Department of Transportation. No location was considered to have a higher than normal accident rate and, hence, no unusual cause for concern. The intersection with the highest accident rate was the US Highway 2 and Trunk Highway 220 intersection. This is to be expected, however, due to the amount of traffic volume present. Although the number of accidents was higher than the other locations, the actual rate (number of accidents divided by traffic volume) was about average. In recent years, the accident rate appears to be decreasing as a result of improvements made to the intersection. The number and types of accidents occurring along the corridor are shown on Figure 7.

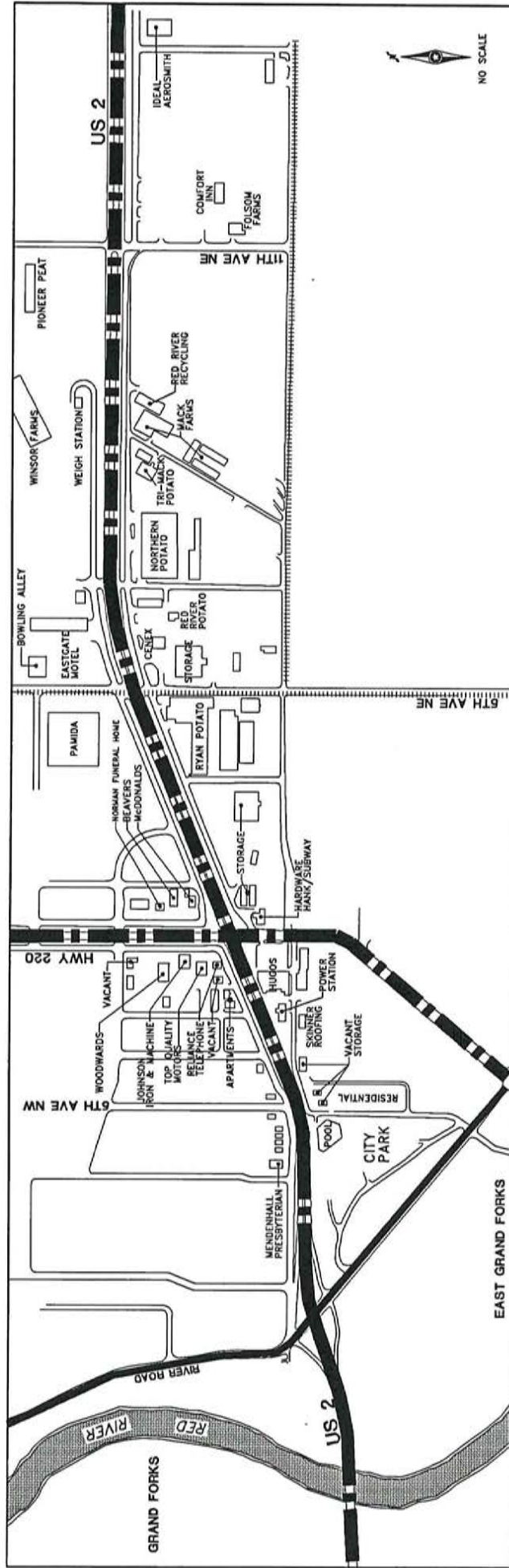
Overall, the corridor is working well from the standpoint of providing regional and subregional transportation in a safe and efficient manner. Deficiencies are present with respect to pedestrian and vehicle access to adjacent commercial and residential property, however. Overall circulation may be improved by providing additional access points along the route. Additional access points may add to stops and delay, however reduced trip length to adjacent property and potential increased economic activity should offset these costs.



EAST GRAND FORKS • US 2 CORRIDOR STUDY
EXISTING CONDITIONS

FIGURE 1





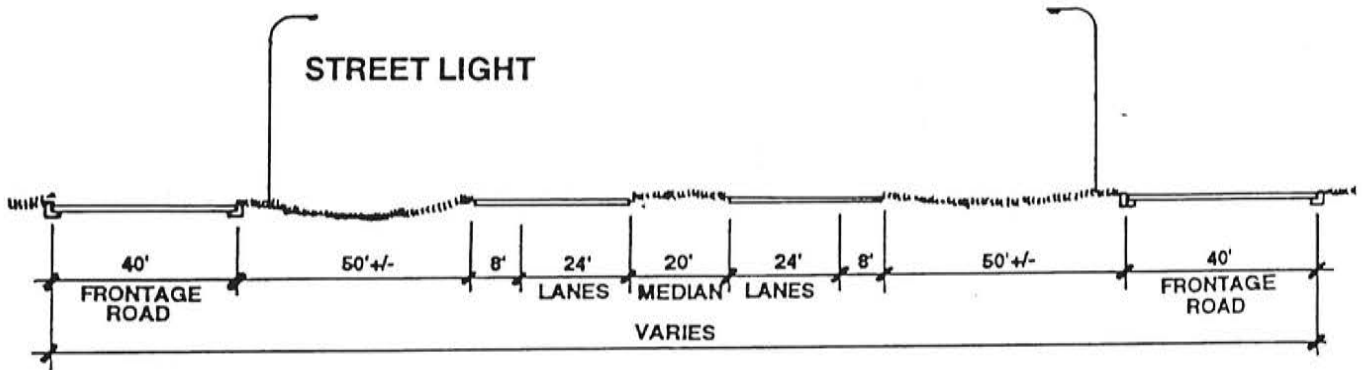
EAST GRAND FORKS • US 2 CORRIDOR STUDY
1990 FUNCTIONAL CLASSIFICATION

LEGEND

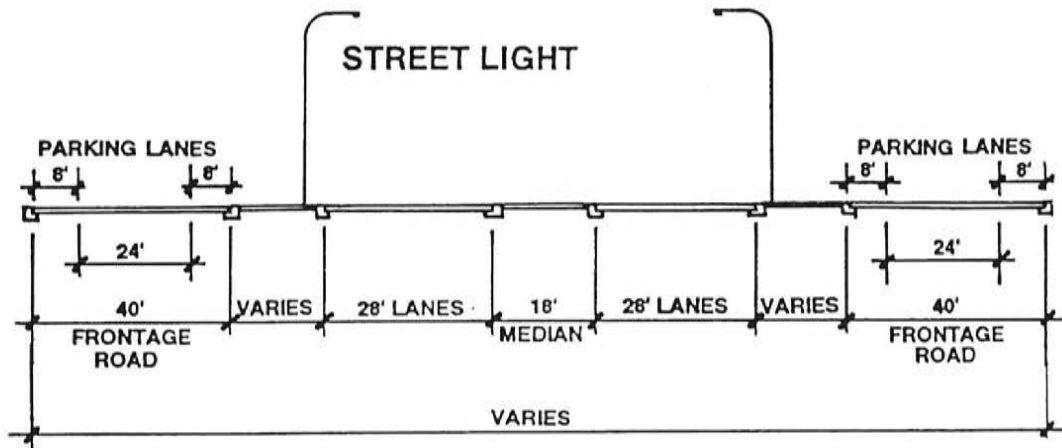
- PRINCIPAL ARTERIAL
- MINOR ARTERIAL
- COLLECTOR

FIGURE 2





EXISTING TYPICAL SECTION EAST OF TH 220



EXISTING TYPICAL SECTION WEST OF TH 220

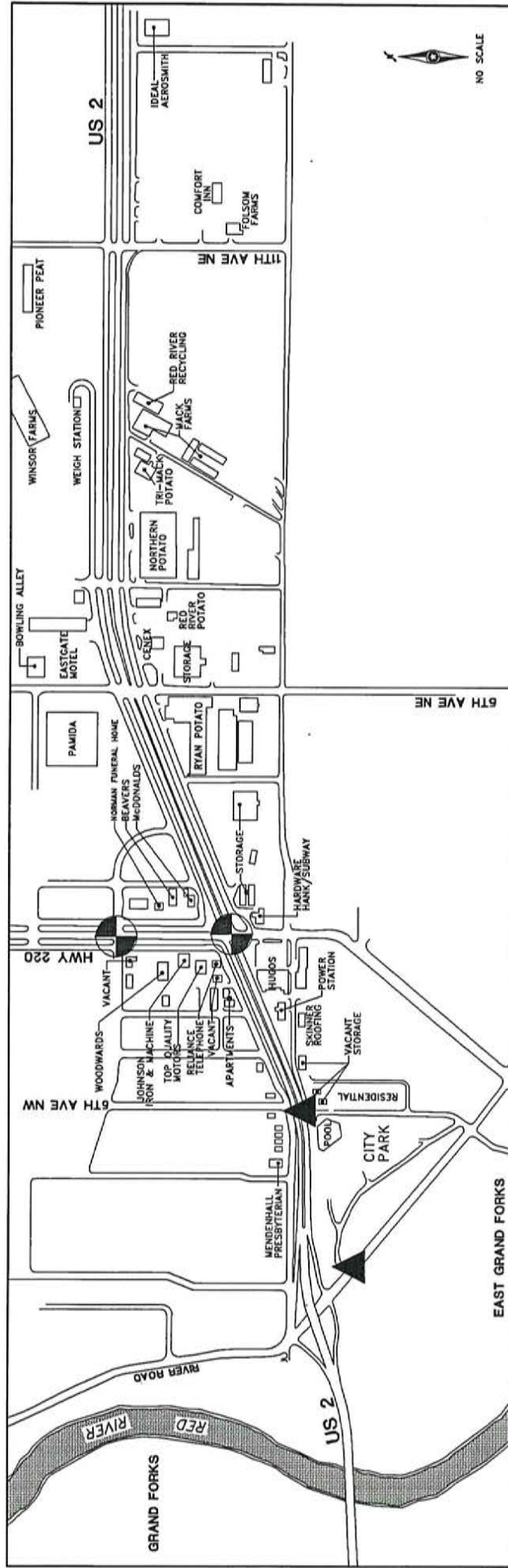
EAST GRAND FORKS
US 2 CORRIDOR STUDY



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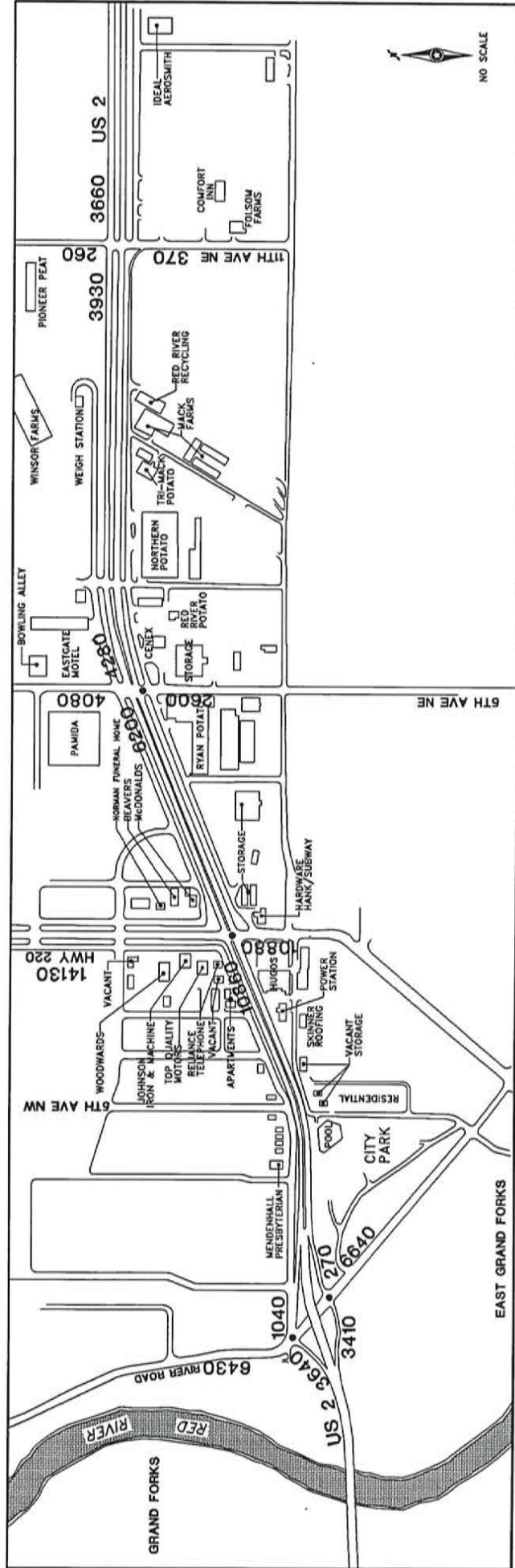
EXISTING
TYPICAL SECTIONS

Figure 3



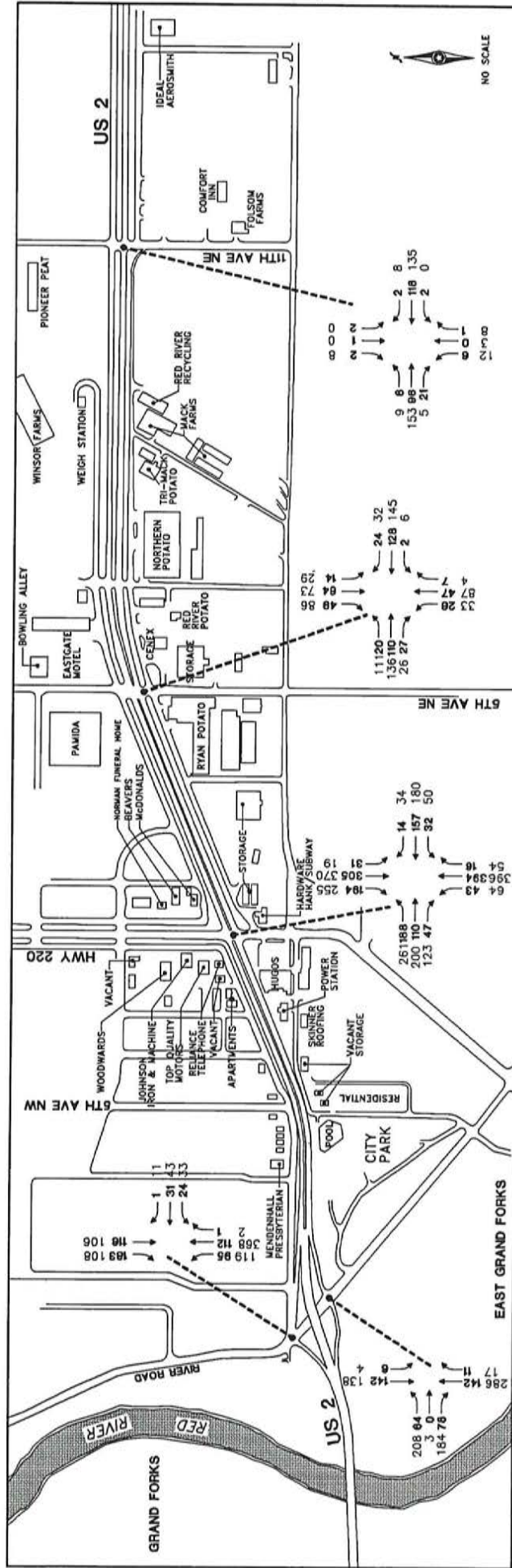
**EAST GRAND FORKS • US 2 CORRIDOR STUDY
EXISTING TRAFFIC SIGNAL AND
WARNING FLASHER LOCATIONS**

- LEGEND**
-  TRAFFIC SIGNAL
 -  PEDESTRIAN WARNING FLASHER



EAST GRAND FORKS • US 2 CORRIDOR STUDY
1993 AVERAGE ANNUAL DAILY TRAFFIC

17800 - 1993 AVERAGE ANNUAL DAILY TRAFFIC



EAST GRAND FORKS • US 2 CORRIDOR STUDY
1993 PEAK HOUR TURNING MOVEMENTS

- 98 1993 A.M. PEAK HOUR TURNING MOVEMENTS
- 99 1993 P.M. PEAK HOUR TURNING MOVEMENTS

FIGURE 6

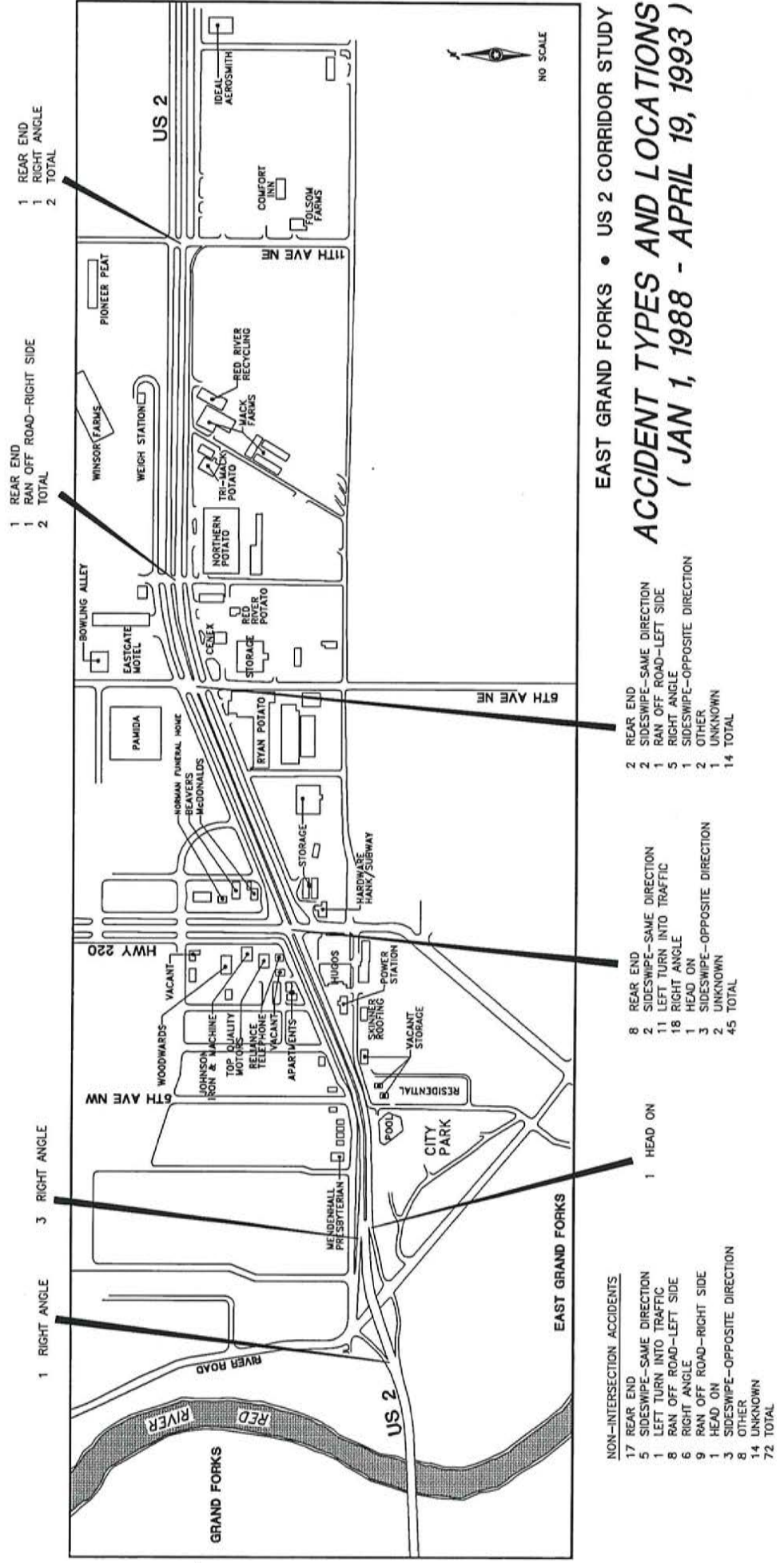


FIGURE 7

ISSUES, OPPORTUNITIES, AND CONSTRAINTS

The extent to which the US Highway 2 corridor meets or does not meet the needs of the citizens of East Grand Forks is the basis of this study. It is these needs and expectations that must be addressed in developing the future direction of the US Highway 2 corridor. As discussed in the introduction, there are several issues along this corridor that have prompted this analysis. They include access to adjacent property, vehicular and pedestrian circulation, pavement condition, bike paths, and overall aesthetics. To formalize the list of issues, a number of activities were conducted. These activities included conducting workshops, committee meetings, and participation of the City of East Grand Fork's Planning and Zoning Commission.

A questionnaire was prepared that identified potential issues that should be studied. To facilitate public participation, the questionnaire was circulated at each workshop, committee meeting, and Planning and Zoning Commission meeting. In addition, notices and questionnaires were sent to citizens who had not attended meetings but had indicated an interest in the study.

Generally, the issues can be broken down into two parts. The first are issues surrounding the corridor in general, the second involves individual intersections. They are summarized as follows.

Corridor Issues

The US Highway 2 corridor is currently a mixture of urban and rural design. Access is only provided at River Road, Trunk Highway 220, Fifth Avenue Northeast, Seventh Avenue Northeast, and 11th Avenue Northeast. The corridor is seen as a barrier to convenient and safe traffic movements north and south. Currently, the corridor experiences a great deal of truck traffic, due to warehouses and grain elevators east of Trunk Highway 220. Access to these vital destinations is hampered by the limited number of access points.

Potential development is also hampered by the current access situation. There have been many proposals for retail development along the north side of US Highway 2 between Trunk Highway 220 and Fifth Avenue Northeast. Difficulty getting to and from this property has been a major concern of potential developers. Land development is also affected in the area that is described as the "BN Triangle." This area is bounded by US Highway 2 to the north, Fifth Avenue Northwest to the west, and DeMers Avenue to the south and east. This parcel is owned by the City of East Grand Forks.

Traffic and pedestrian circulation problems are particularly noticeable in the area between Trunk Highway 220 and River Road. North of US Highway 2, the area is primarily residential with a church, high school, and high-density residential properties creating the majority of the traffic demand. In order to access these areas, one must either use River Road or Trunk Highway 220. There are no intermediate access points to relieve traffic from these two areas. This is a particular concern from an emergency vehicle access standpoint. The condition of the pavement on US Highway 2 between Trunk Highway 220 and River Road is also an issue. The pavement is cracking and spalling and will require major repairs in the near future. This section of US Highway 2 is ranked fourth by MnDOT District 2 on a December 23, 1992, list of potential candidates

for programming. The ranking, which is based on pavement quality index (PQI), implies that this section will likely be targeted for programming in the near future.

The City of East Grand Forks has adopted a bikeway plan that sets forth corridors where bike facilities will be provided. Until this point, the bikeway plan has not been implemented. An important aspect of the US 2 corridor study is to ensure that bikeway facilities are incorporated in an overall plan for future implementation.

Aesthetics is an issue that is many times given less than prominent attention. The aesthetics of this roadway will be very important to the overall image of the City of East Grand Forks. Since US Highway 2 is one of the heavier used transportation facilities, it is critical that it receive special attention with respect to landscaping and other aesthetic treatments. These treatments should include berming, landscaping, signage improvements, and lighting improvements.

A listing of the issues involving the corridor and specific intersections is provided on Figure 8.

Intersections

River Road/US 2

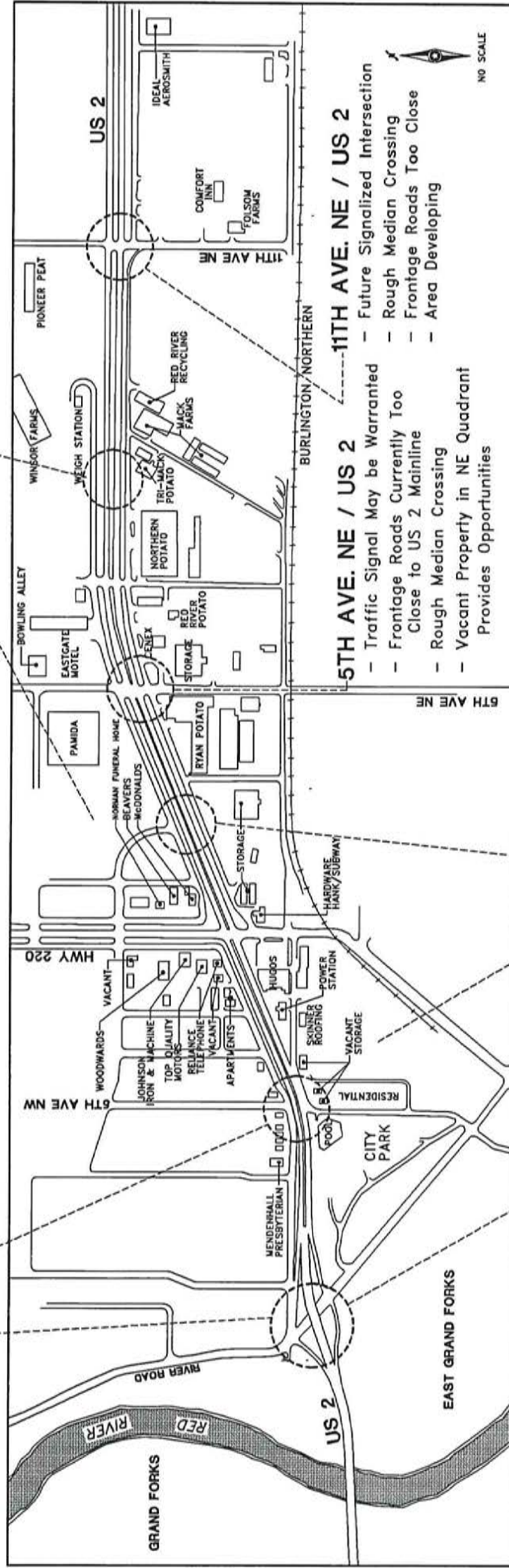
The interchange at River Road and US Highway 2 provides separation of US Highway 2 traffic and River Road traffic and important access from the highway to downtown East Grand Forks and areas north of the corridor. The interchange allows access without impeding traffic along US Highway 2. The interchange was constructed at the time US Highway 2 was constructed in its present alignment in the early 1960s. The reasons for the interchange are probably more due to elevation differences than traffic operations. Traffic volume along River Road and US Highway 2 is low enough that it could have been handled by way of an at-grade intersection rather than an interchange.

There are deficiencies that need to be corrected in the interchange, however. They include awkward movements between the westbound and eastbound Highway 2 traffic and River Road. Drivers using the off-ramps are confronted with difficult angles with which to keep track of traffic in each direction. Signing and markings may require upgrading to reduce confusion for the unfamiliar motorist.

Fifth Avenue Northwest

The intersection of Fifth Avenue Northwest and US Highway 2 is probably the most complicated location within the study area. The frontage roads are very close to US Highway 2 in order to prevent acquiring property on both sides. There is a desire by the general population to have an access point between Trunk Highway 220 and River Road. This access point would most likely be at the intersection with Fifth Avenue Northwest. An access point at this location would provide circulation both to the residential area north of the highway and the commercial areas to the south. The "BN Triangle" described earlier can be accessed directly by Fifth Avenue Northwest and could be greatly enhanced if a street intersection were provided at US Highway 2.

- US 2**
 - Deteriorating Pavement
 - Insufficient Access To The North
- 5TH AVE. NW / US 2**
 - Uncontrolled Pedestrian Crossing
 - Swimming Pool and Park Creates Demand
 - Frontage Roads Too Close to US 2 Mainline if Intersection Created.
 - Connection Would Improve Circulation Between River Road and TH 220.
 - Connection Would Cause Through Traffic to Use 5th Ave. North of US 2.
 - Some Property Acquisition
 - Increase Traffic on 5th Ave. South of US 2 Would Create Pedestrian Safety Problem for East-West Travel.
- AT GRADE RAIL CROSSING**
 - Potential Retail Development
 - Insufficient Access
 - Positive Protection (gates) Not Installed
 - Potential for Delays
 - Improved Signing / Marking



- RIVER ROAD / US 2**
 - Site Distance To and From Ramps Appear Substandard
 - Signing / Marking Unclear
 - Intermittent Congestion
 - Westbound Exit Awkward
- BN TRIANGLE**
 - Possible Event Center Location
- 3rd AVE. NE / US 2**
 - Better Access Required to Commercial Area
 - Frontage Roads Too Close to US 2 Mainline if Intersection Created
 - Access Should Serve Properties North and South of US 2
 - Signalization Would Increase Delays on US 2
- 5TH AVE. NE / US 2**
 - Traffic Signal May be Warranted
 - Frontage Roads Currently Too Close to US 2 Mainline
 - Rough Median Crossing
 - Vacant Property in NE Quadrant Provides Opportunities
- 11TH AVE. NE / US 2**
 - Future Signalized Intersection
 - Rough Median Crossing
 - Frontage Roads Too Close
 - Area Developing

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PROJECT ISSUES

The needs of vehicular traffic are important. The safety of pedestrian traffic across US Highway 2 at this intersection may be an even greater concern. At the southwest corner of this intersection is a city park and a swimming pool. This is a big attraction to children that live north of the corridor. At present, there is only a marked crosswalk with two overhead flashers that advise motorists of the pedestrian crossing area. The overhead flashers operate 24 hours a day, seven days a week. Although the crossing is marginal, there have been few accidents that involve pedestrians at this location.

Trunk Highway 220

The intersection of Trunk Highway 220 and US Highway 2 was recently reconstructed. The work involved adding right-turn lanes and extending left-turn bays in each direction. In conjunction with this project, Trunk Highway 220 was improved between US Highway 2 and 17th Street Northwest. Traffic signals at the intersection were also rebuilt as part of this project. The existing traffic counts indicate that this intersection is working at an acceptable level of service. The level of service will continue to be acceptable through the year 2010 based upon forecasted traffic volumes. Therefore, further improvements to this intersection should not be needed in the foreseeable future.

Third Avenue Northeast

Third Avenue Northeast intersects the frontage roads at two points within the corridor. Along the north side, Third Avenue Northeast circles the back of a McDonalds restaurant and intersects the frontage road. On the south side, Third Avenue intersects the frontage road adjacent to Ryan Potato warehousing. The property north of US Highway 2 is presently zoned for retail use and is under active consideration for development. Development will require better access to US Highway 2 than is presently provided.

Fifth Avenue Northeast

The intersection of Fifth Avenue Northeast is currently connected to US Highway 2 both north and south of the corridor. At present, the intersection is controlled with stop signs only. Because the corridor has a rural cross-section, the median is depressed through the intersection. This causes north-south traffic to experience severe discomfort as it traverses US Highway 2. The change in elevation through the median area is potentially dangerous, as evidenced by the scratches in the pavement indicating undercarriages of vehicles scraping the pavement.

An additional concern is the fact that traffic volumes along Fifth Avenue Northeast area are approaching that necessary to require signalization. If a signal were installed at this intersection, the median area would have to be reconstructed in order to allow for safe and convenient north-south movement of traffic with a design speed of at least 30 miles per hour. This cannot be done under the current geometrics.

Improvements to this intersection will be necessary in order to accommodate potential retail development on either side of US Highway 2. Along the north side, there is vacant property east of Fifth Avenue Northeast. Along the south side, Fifth Avenue Northeast connects to the rest of East Grand Forks and is one of the few vehicular crossings over the Burlington Northern railroad tracks. In fact, Fifth Avenue Northeast is the only crossing between US Highway 2 to the east and Trunk Highway 220 to the west.

Railroad Crossing

East of Seventh Avenue Northeast, there is a spur railroad track that is in place to serve Winsor Farms north of the corridor. This spur track is used very rarely and, in fact, is a candidate for removal.

11th Avenue Northeast

Eleventh Avenue Northeast experiences traffic difficulties similar to that of Fifth Avenue Northeast, but does not carry as much traffic volume. However, it does provide full access across US Highway 2. At some point in the future, traffic volume will achieve that necessary for signalization. In the meantime, the median needs to be improved so as to remove the inconvenient and uncomfortable travel characteristics. As part of any roadway improvement, the median should be improved to allow for a minimum 30 mile per hour crossing to accommodate both commercial and passenger vehicles.

15th Avenue Northeast

Fifteenth Avenue Northeast will potentially serve a large grain elevator south of the corridor. The grain elevator is expected to have access to US Highway 2 via the extension of 10th Street to the east and with an ultimate connection of 15th Avenue Northeast to US Highway 2. Such a connection would allow much needed access to the commercial areas north and south of the roadway and would help to promote economic activity. Median treatments and frontage road locations would have to be modified, however, if this connection were to be made.

ALTERNATIVE DEVELOPMENT

Alternatives were developed to address the issues described earlier. As before, the corridor was examined as a whole, looking at such issues as access policy, typical section, traffic signal locations, frontage road, lighting, and bicycle/pedestrian circulation. The corridor then was further broken down into specific intersection improvement alternatives.

As a general rule, the alternatives selected were examined to ensure their appropriateness for a given situation. The design standards of the Minnesota Department of Transportation and the American Association of State Highway Transportation Officials (AASHTO) were followed. The alternatives were developed through meetings with the general public, area workshops, and committees.

Figure 9 provides an overall view of the alternatives that were studied.

Typical Section

An overriding concern of the citizenry of East Grand Forks was the existing cross-section of US Highway 2. Currently, the street varies in width and character from an urban four-lane divided facility between the Red River and Trunk Highway 220 and a rural section from Trunk Highway 220 east. The area east of Trunk Highway 220 is most likely for economic development. The existing rural section is seen as an impediment to that development. The major concerns involve severe median geometrics that make crossing US Highway 2 difficult and the limited number of access points. The rural design causes traffic to pass through the corridor at a high rate of speed, which further reduces safe and convenient access to property on either side as well as the ability of pedestrians and vehicular traffic to cross the highway.

For this reason, it was established that US Highway 2 should be reconstructed to an urban four-lane divided section. Two 14-foot lanes in each direction were used for estimating purposes. This should prove to be adequate, however, preliminary design may include a greater width to facilitate snow removal activities. The median treatments and auxiliary lane treatments would be such that they would accommodate projected traffic volumes but also provide efficient access to adjacent property. Two cross-sections were developed that are similar. The primary difference involves the median treatment and the frontage roads. Looking at Figure 10, the upper section shows what the street configuration would be like east of Trunk Highway 220. Note that the frontage roads are narrowed to 36 feet wide, which would accommodate an 8-foot parking lane and two 14-foot lanes. Parking would be prohibited on one side. Along the north side of the highway, a bike path would be installed between the frontage road and the highway. The bike path would be a minimum of 10 feet wide and would be located roughly half way between the frontage road and the highway with a 10-foot minimum separation between the path and the frontage road and/or the highway.

In the lower section shown on Figure 10, a different treatment is applied to the bike paths. This is the treatment that would be expected west of Trunk Highway 220. In this area, a five-foot bike path is provided in each direction along the frontage road and is not separate from the roadway. This is quite common in urbanized areas and tends to reduce objections by residents living nearby. The median treatment in the lower section shown

RIVER ROAD

1. Short Term Improvements
2. Relocate Ramp Terminals To The South
3. Relocate Ramp Terminals To The North

5TH AVE. NW

1. No Build with Pedestrian Overpass
2. Connection to the South
3. Full Connection to the North and South

3RD AVE. NE

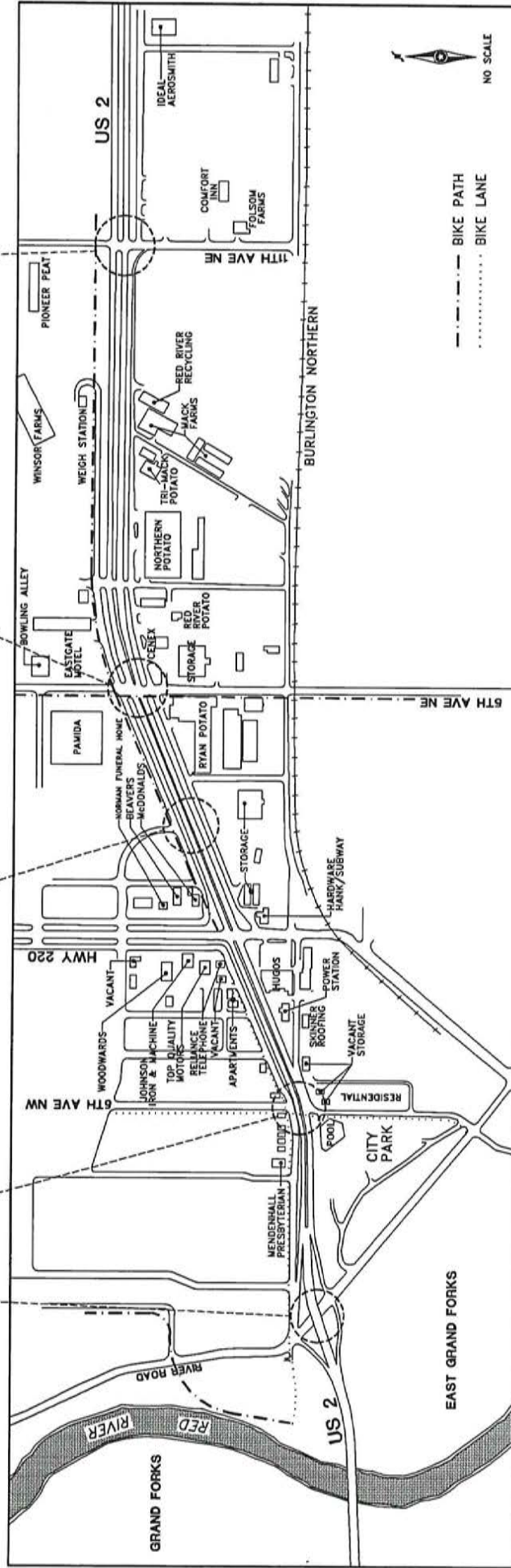
1. No Build
2. Connection to the North
3. Full Connection to the North and South (Requires Realignment of 3rd Ave. South of US 2)

5TH AVE. NE

1. Modify Frontage Roads to Provide 100' Separation and Install Traffic Signal when Warranted.

11TH AVE. NE

1. Modify Frontage Roads to Provide 100' Separation and Install Traffic Signal when Warranted.



OVERALL CORRIDOR

- URBAN SECTION (CURB AND GUTTER) WITH 18' PAVED OR LANDSCAPED MEDIAN.
- STREET ACCESS WITH MEDIAN OPENINGS AT 1/4 MILE INTERVALS.
- TRAFFIC SIGNALS SPACED 1/2 MILE INTERVALS.
- FRONTAGE ROADS ALONG ENTIRE CORRIDOR.
- STREET LIGHTS ALONG ENTIRE CORRIDOR.

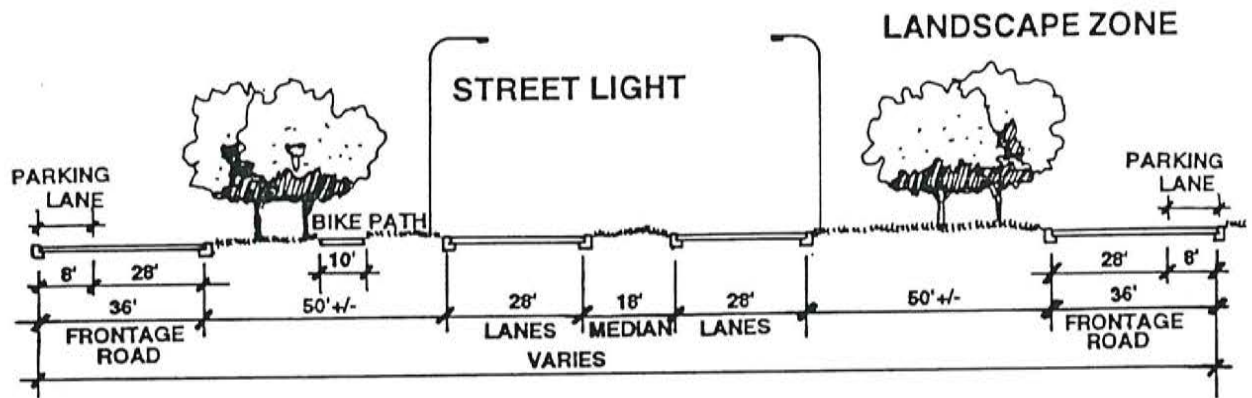
EAST GRAND FORKS • US 2 CORRIDOR STUDY

PRELIMINARY ALTERNATIVES

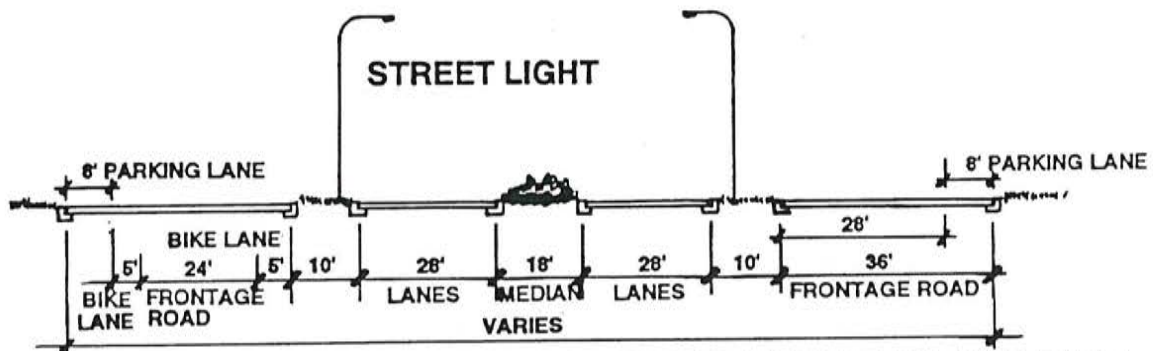
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PARSONS TRANSPORTATION GROUP

FIGURE 9



**PROPOSED URBAN SECTION - PAVED OR GRASS MEDIAN
EAST OF TH 220
(SEPARATE BIKE TRAIL)**



**PROPOSED URBAN SECTION- LOW PLANTING IN MEDIAN AND BIKE
WEST OF TH 220
LANES**

EAST GRAND FORKS
US 2 CORRIDOR STUDY



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**ALTERNATIVE
TYPICAL SECTIONS**

Figure 10

on Figure 10 is also different than that shown in the upper alternative. The median area could either be grassed or planted with low shrubs. The choice would depend upon the level of maintenance that the responsible jurisdiction would be willing to provide.

Both of the proposed alternative sections show trees in the area between the highway and the frontage roads. It is expected that these trees would be of a deciduous type, which would allow good visibility at maturity. Of paramount importance, however, is that trees are placed back from the highway a sufficient distance so as to not encroach upon clear zone requirements. This distance is typically 20 to 30 feet. The actual distance would be decided at the preliminary and final design stages for the highway project.

The location of bike paths along the corridor were determined through discussions with the various committee members and by consulting the Grand Forks/East Grand Forks Transportation Plan Update (bicycle element). The bicycle paths selected are consistent with this plan. An illustration of the location of the bike paths is shown on Figure 11.

US Highway 2 within the study limits currently has street lighting up to approximately Seventh Avenue Northeast. These street lights are adequate for the type of street section that exists. Changes should be made, however, if the urban cross-section proposed earlier is implemented. Street lighting should be more of a typical "bent straw" pole design, which would apply lighting directly onto the street surface. Pole heights should be in the range of 35 to 40 feet with 400-watt, high-pressure sodium luminaires. This would provide the maximum spacing and, therefore, maximum efficiency with lowest overall cost. Since the area is commercial, the higher type mounting heights should be acceptable with light spill-back onto the frontage roads.

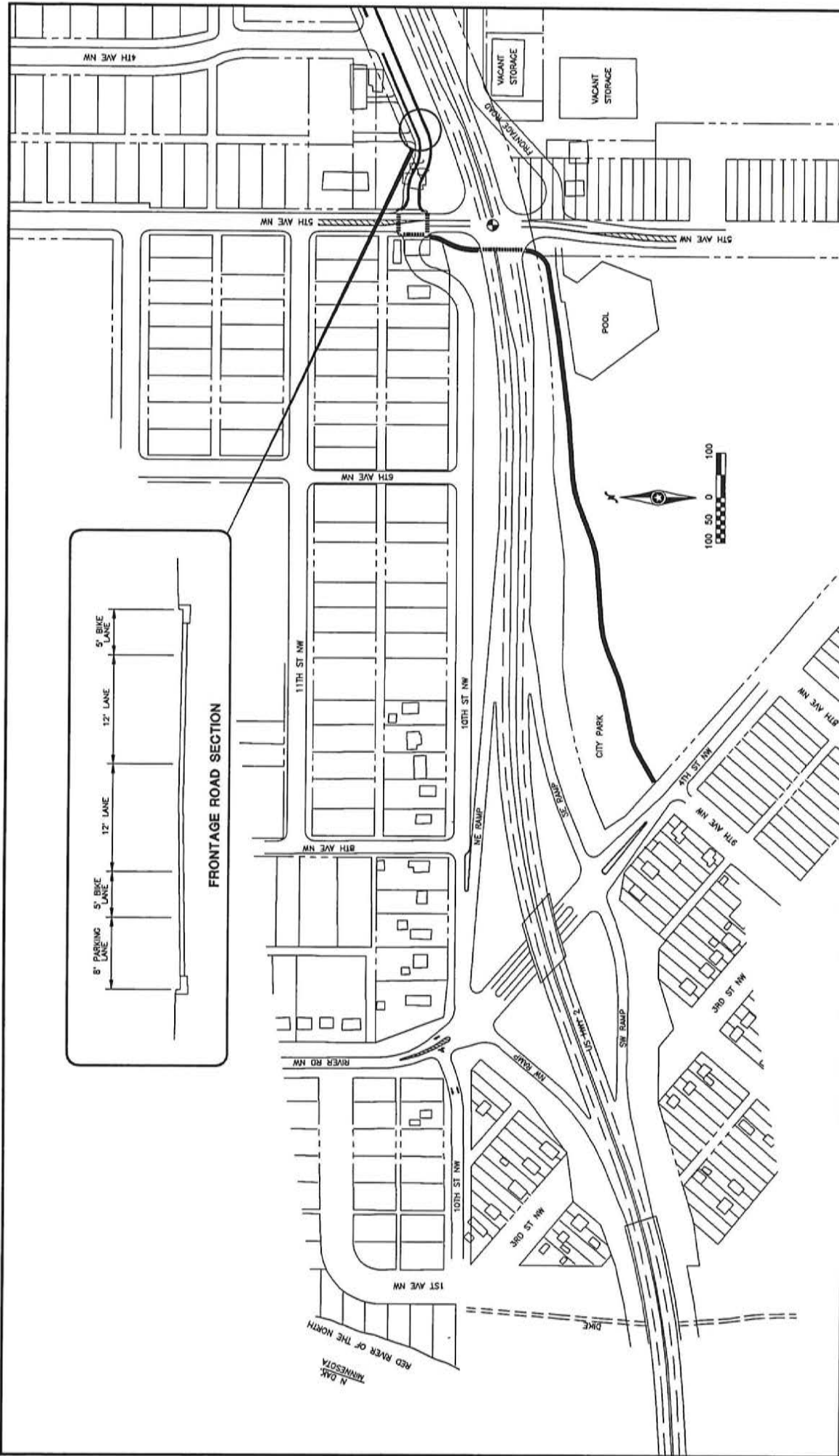
The specific alternatives pertaining to each intersection will be discussed in the following.

River Road/US 2

Three alternatives were evaluated for the River Road/US 2 interchange. These alternatives are depicted on Figures 12, 13, and 14.

Alternative A provides a short-term improvement to the existing awkward intersections as discussed earlier. Improvements include the addition of a raised median on the south side of the southwest and southeast ramp terminals. The raised median is complemented by additional signing and marking, which make clear the fact that the ramps are one-way. On the north side of US Highway 2 at Eighth Avenue Northwest, a median was installed between the northeast ramp and the 10th Street Northwest merge point. By extending this median, positive control has been provided that prohibits traffic westbound on the northeast ramp from turning north onto Eighth Avenue Northeast. This, in conjunction with other signage, adds to this positive control.

Alternative B is a more ambitious method of controlling traffic within the interchange. This alternative essentially shifts both ramp terminals south approximately 50 feet in order to provide for a 90-degree connection on the north side of US Highway 2. This alternative would, however, require purchase of right-of-way on the south side of the highway adjacent to the southwest ramp. Perhaps more significantly, this improvement would require construction of a local street in front of houses west of Eighth Avenue



- LEGEND**
- BITUMINOUS BIKE PATH
 - BIKE LANE
 - ⊙ TRAFFIC SIGNAL

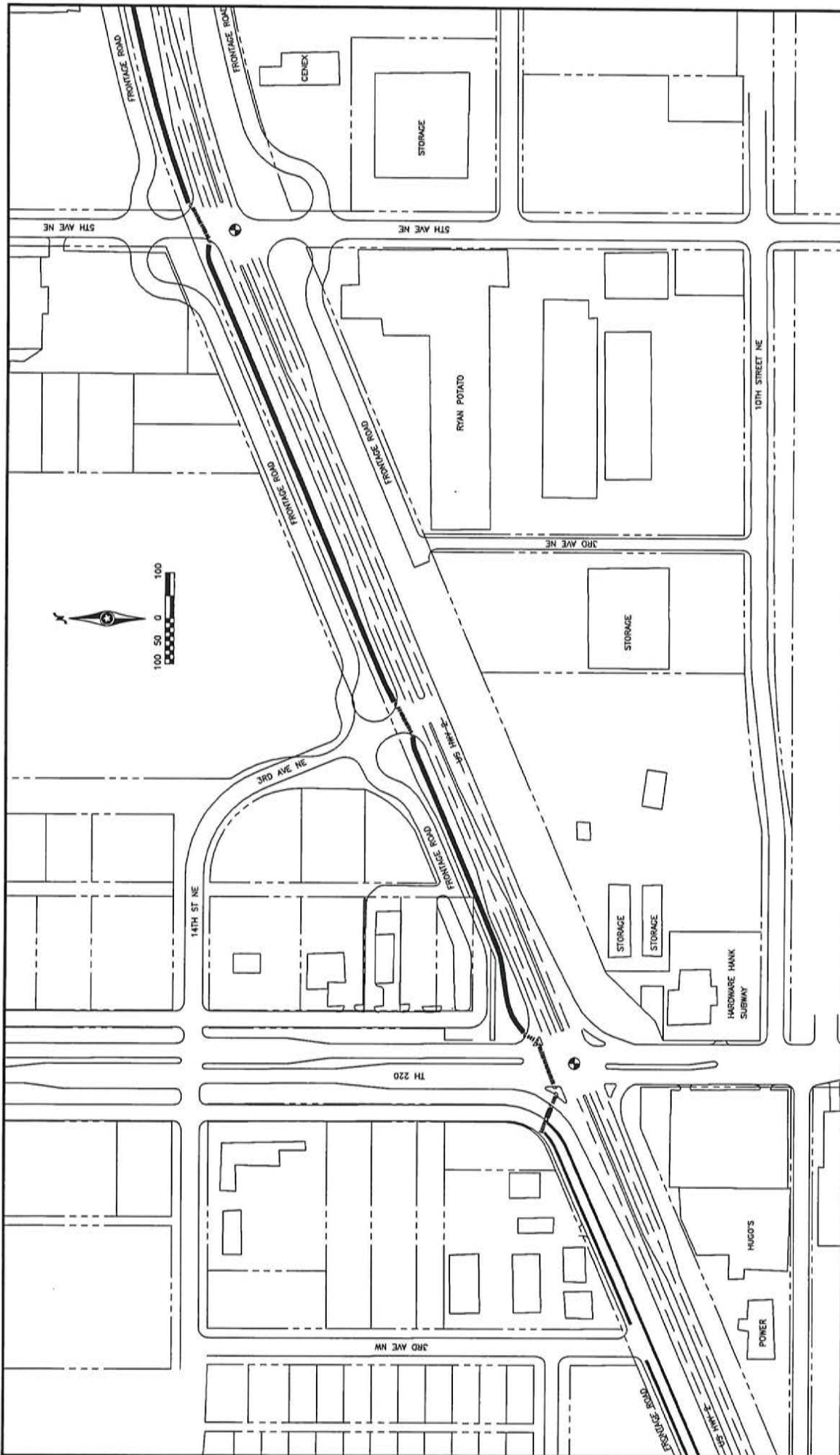
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 US 2 CORRIDOR STUDY

RECOMMENDED BICYCLE FACILITIES

FIGURE 11A



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LEGEND
 — BITUMINOUS BIKE PATH
 - - - BIKE LANE
 ⊕ TRAFFIC SIGNAL

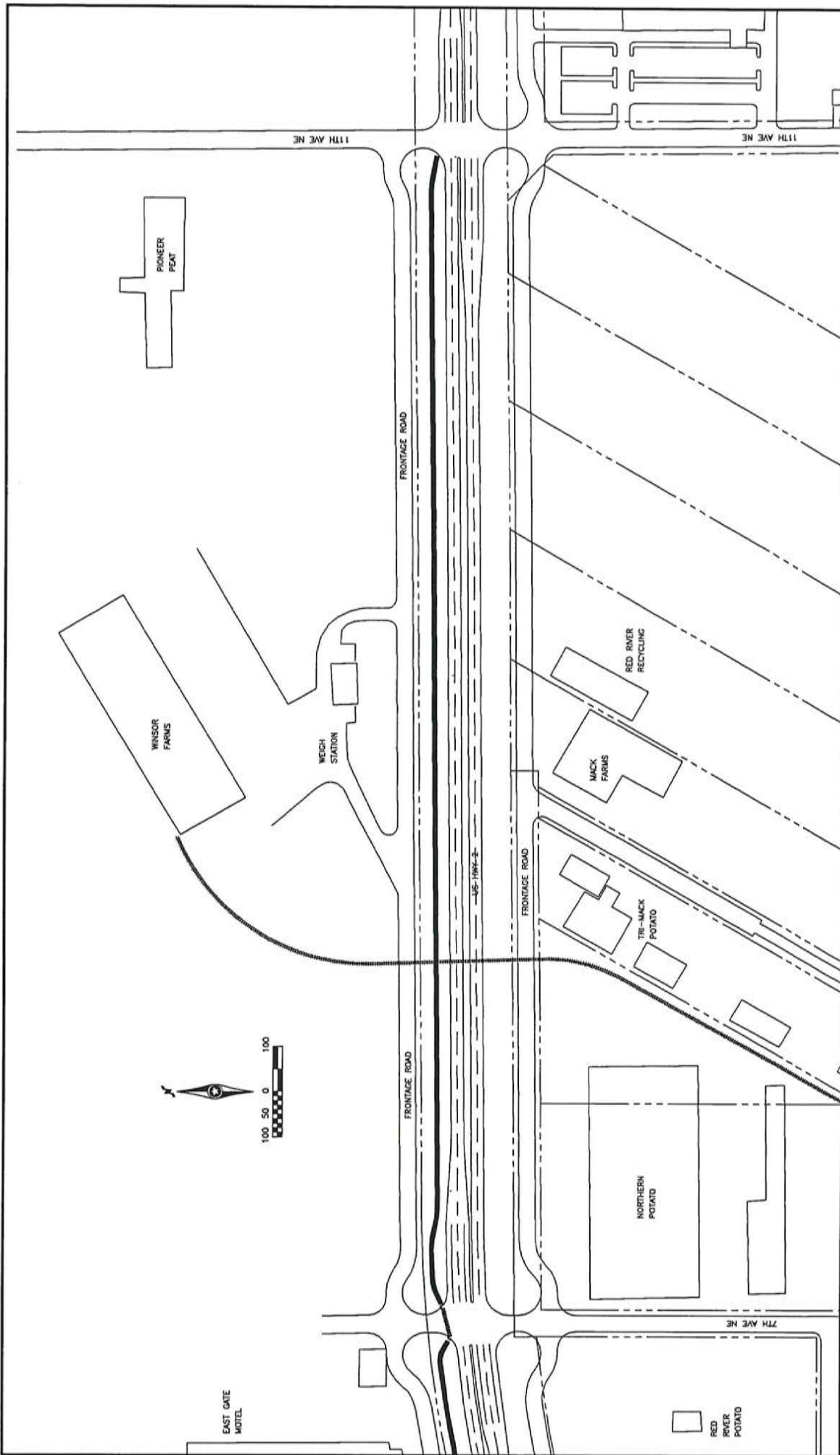
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RECOMMENDED BICYCLE FACILITIES

FIGURE 1B

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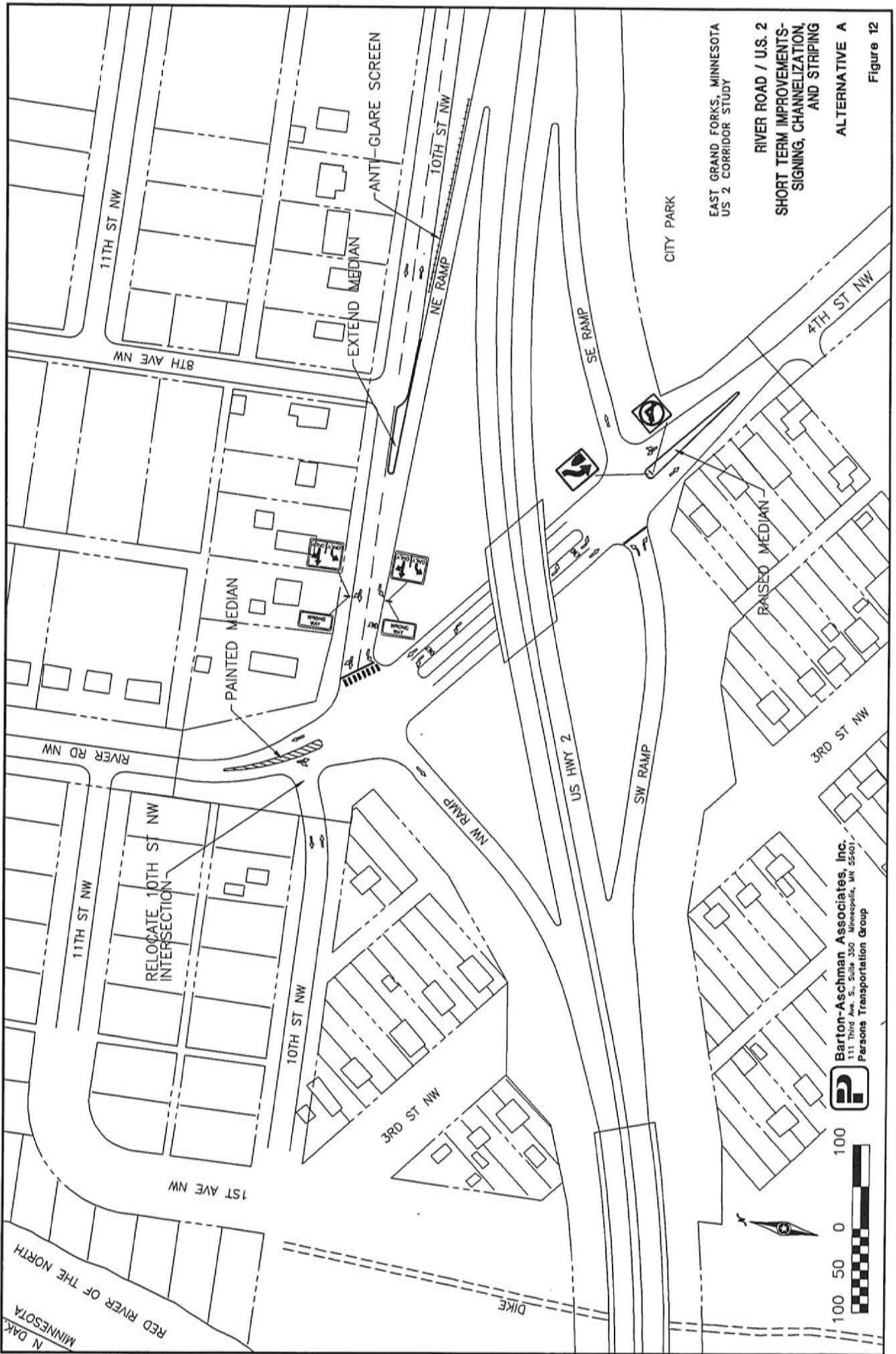




EAST GRAND FORKS, MINNESOTA
 US 2 CORRIDOR STUDY
RECOMMENDED BICYCLE FACILITIES
 FIGURE 11C

LEGEND
 — BITUMINOUS BIKE PATH
 — BIKE LANE
 ● TRAFFIC SIGNAL

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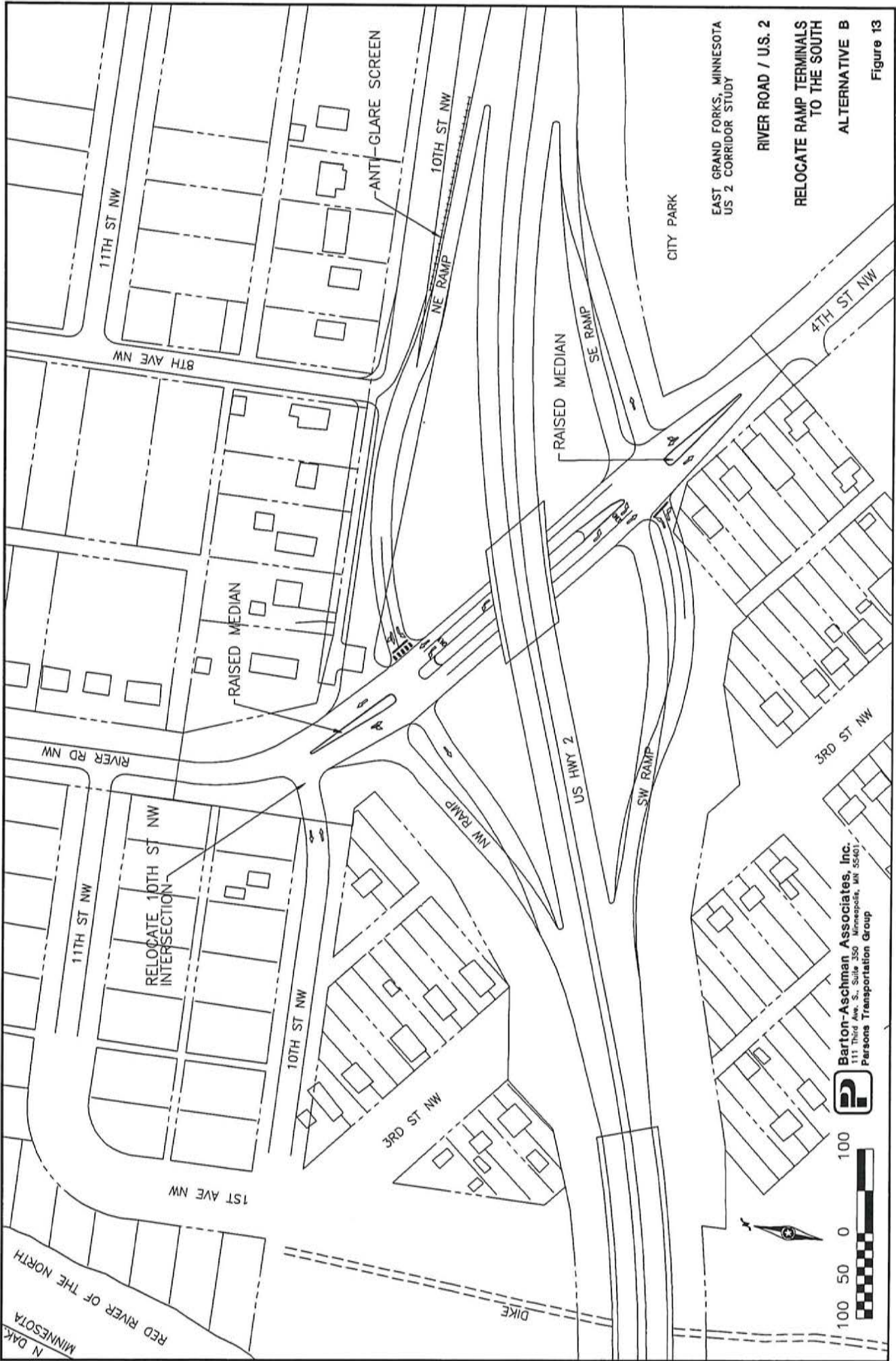
**RIVER ROAD / U.S. 2
SHORT TERM IMPROVEMENTS-
SIGNING, CHANNELIZATION,
AND STRIPING**

ALTERNATIVE A

Figure 12

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US 2 CORRIDOR STUDY

RIVER ROAD / U.S. 2

RELOCATE RAMP TERMINALS
TO THE SOUTH
ALTERNATIVE B

Figure 13

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N DAK
MINNESOTA
RED RIVER OF THE NORTH

RELOCATE 10TH ST NW
INTERSECTION

RAISED MEDIAN

ANTI-GLARE SCREEN

NW RAMP

NE RAMP

RAISED MEDIAN

SE RAMP

US HWY 2

SW RAMP

CITY PARK

RIVER RD NW

11TH ST NW

8TH AVE NW

11TH ST NW

1ST AVE NW

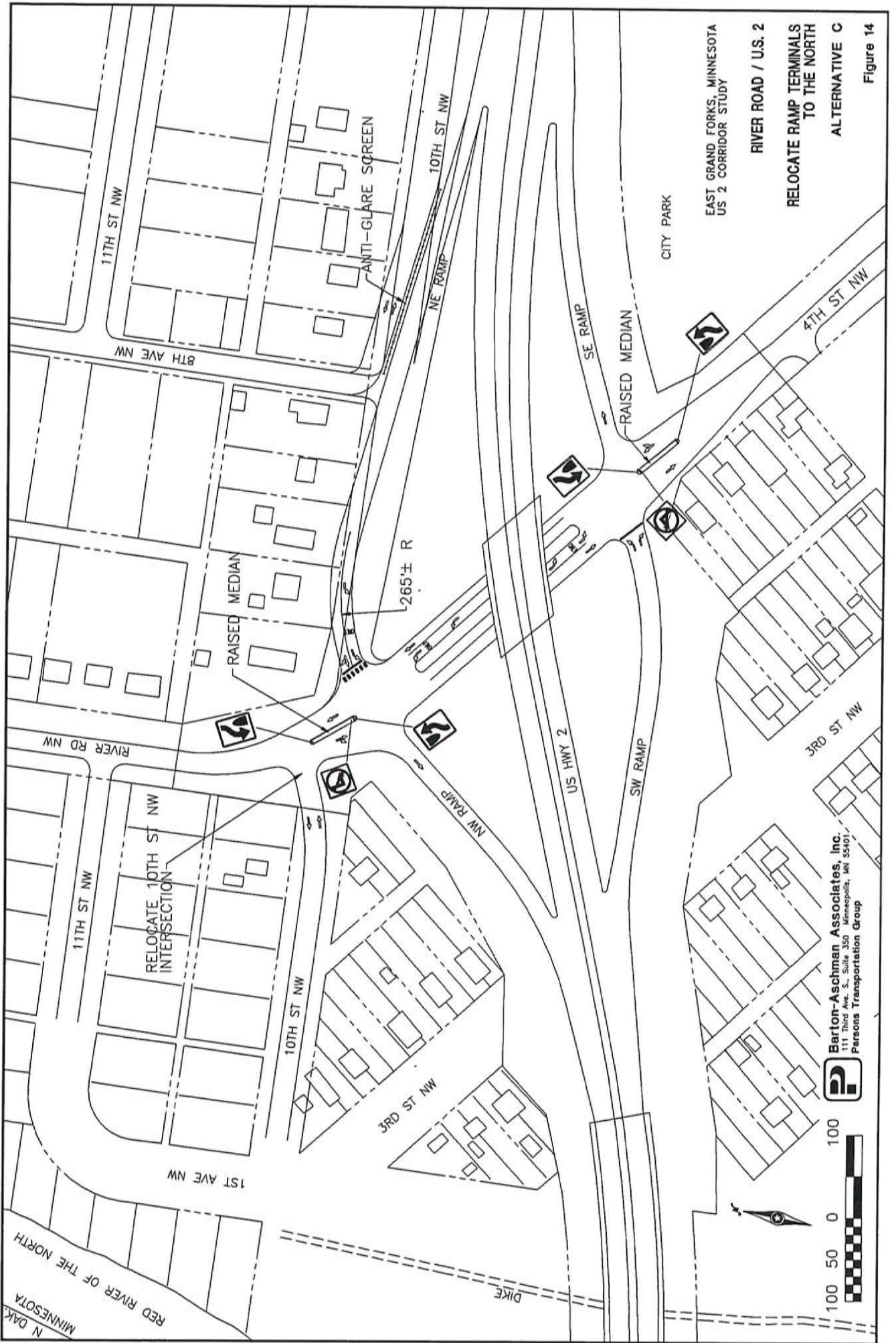
10TH ST NW

3RD ST NW

3RD ST NW

4TH ST NW

DIKE



EAST GRAND FORKS, MINNESOTA
US 2 CORRIDOR STUDY

RIVER ROAD / U.S. 2

RELOCATE RAMP TERMINALS
TO THE NORTH
ALTERNATIVE C

Figure 14

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Northwest so that they would have public street access. Their only access today is by way of 10th Street Northwest. This local street would require purchase of right-of-way in order to be constructed.

Alternative C is similar to Alternative B except that no shifting of the ramp terminal locations is necessary. All of the geometric changes are done on the north side of the highway. This does require purchase of at least two homes because they will no longer have access to a public street. Also required, will be the closing of 10th Street west of Eighth Avenue Northwest. Traffic on 10th Street would be diverted to Eighth Avenue Northwest and circulated up through the neighborhood.

Fifth Avenue Northwest

The intersection of Fifth Avenue Northwest and US Highway 2 is probably the most controversial along the corridor. Three alternatives were examined. Figures 15, 16, and 17 illustrate the alternatives studied.

Alternative A includes the construction of a pedestrian overpass at the intersection to provide for a safe pedestrian crossing. As part of this alternative, at least one home in the northwest corner of the intersection of 10th Street Northwest and Fifth Avenue Northeast would be needed. Also required would be the construction of a fence within the median area to prohibit children and adults from crossing the street at-grade. While this alternative does address the problem with pedestrian access, it does not improve vehicular circulation or economic development.

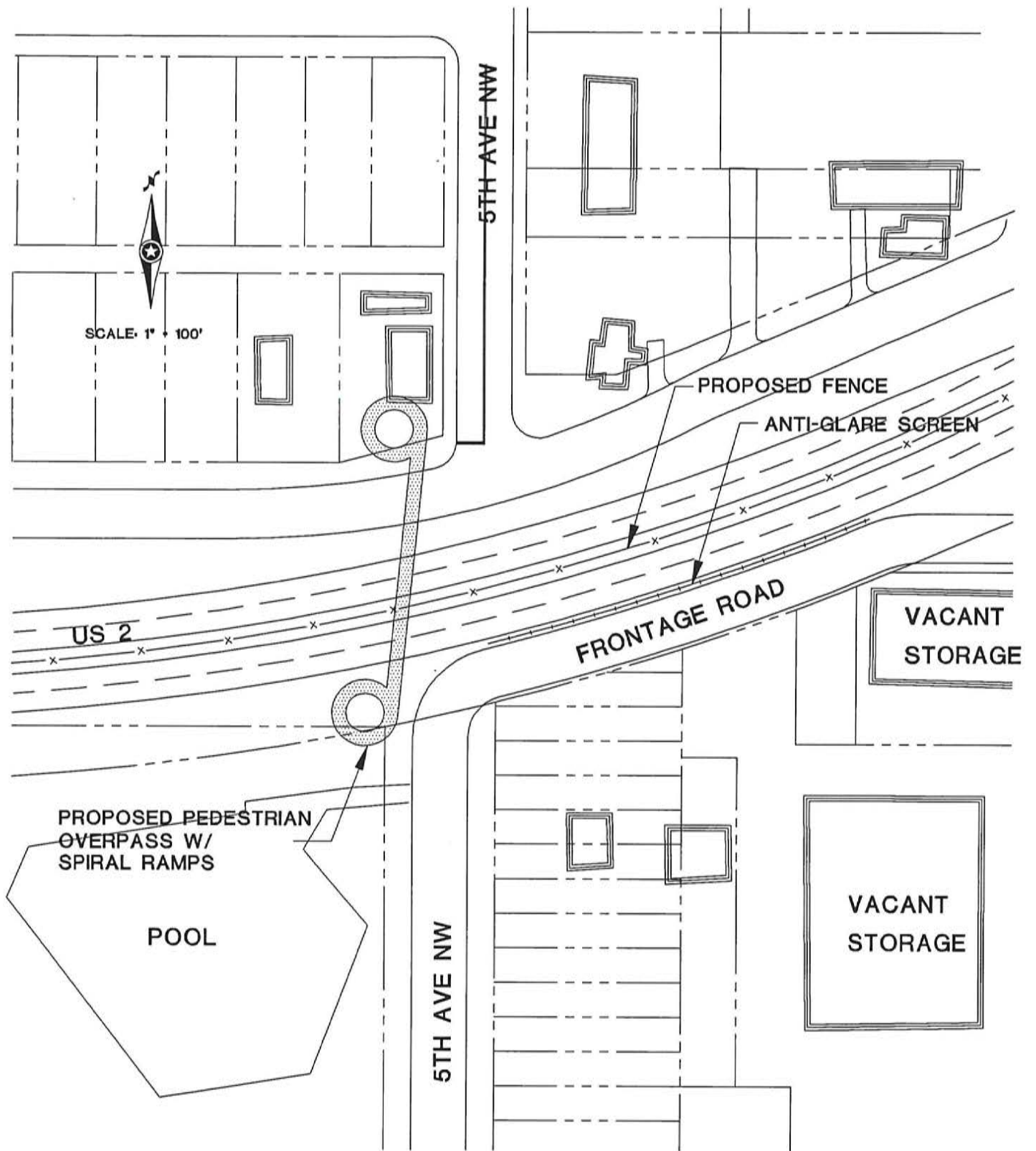
Alternative B shows a north and south connection of Fifth Avenue Northwest at US Highway 2. In order to provide this connection, a traffic signal would need to be installed and the frontage roads would need to be moved a minimum of 100 feet away from the highway. Moving the frontage roads back this distance would require taking homes on each corner of the intersection.

This alternative would provide positive control for pedestrians, who would have the benefit of the traffic signal, and would also provide for good north-south circulation between the residential and areas to the north and the commercial/recreational areas to the south. This alternative would address the access needs of the property required for economic development in the "BN Triangle" area.

Alternative C is similar to Alternative B, however, there is only a south connection and no north connection. This alternative was studied because there was a concern on the part of many that providing an access to the north would increase traffic on what is now a quiet residential street. The benefits to pedestrian access would be the same as that for the north-south connection. Vehicular circulation, however, would not see as great a benefit. Alternative C would require the purchase of one home in the southeast corner of the intersection.

Trunk Highway 220

The intersection of Trunk Highway 220 and US Highway 2 was reconstructed in 1990. The left-turn bays and right-turn lanes were constructed such that sufficient storage

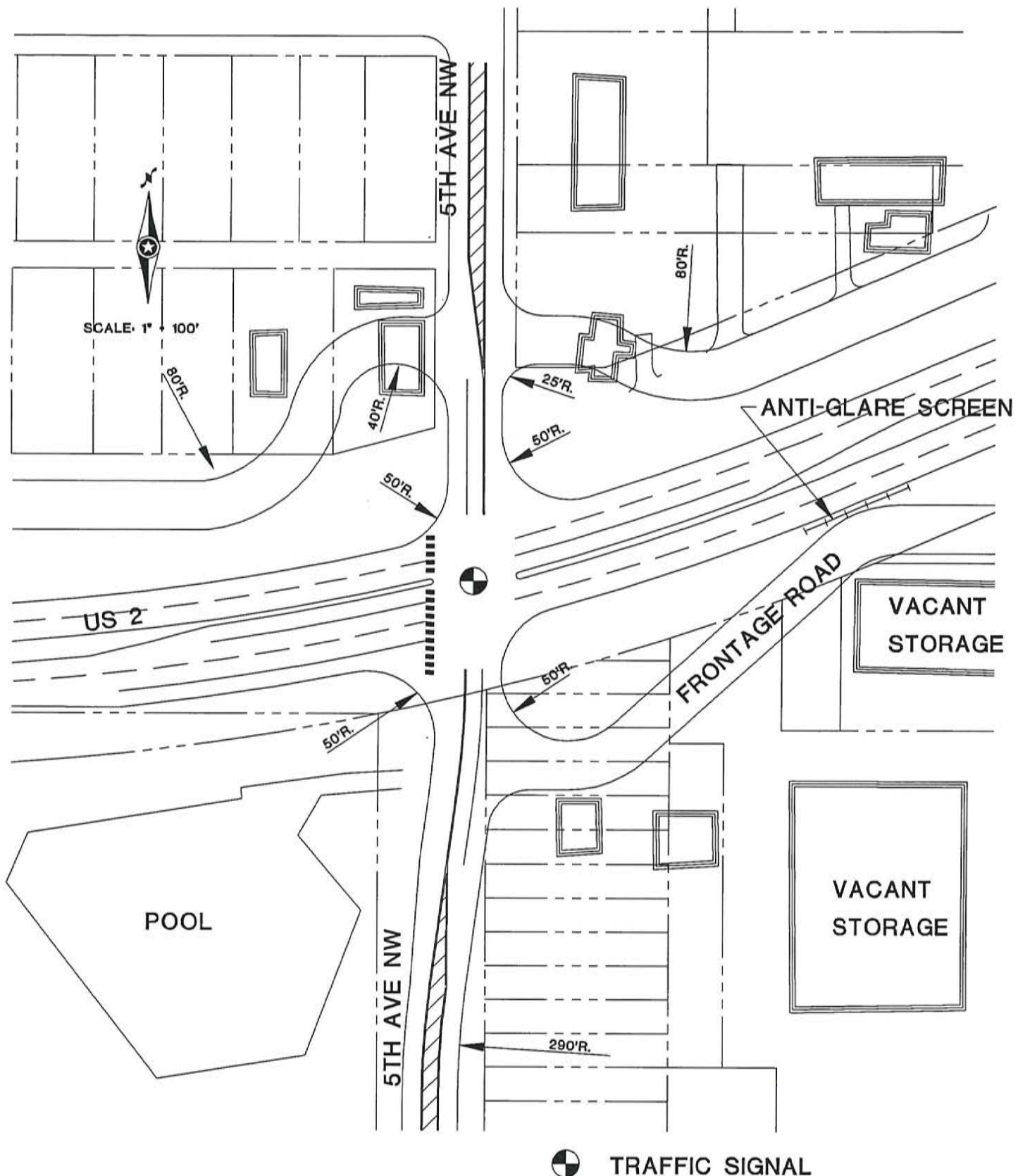


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US 2 CORRIDOR STUDY



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**5th AVENUE NW
ALTERNATIVE A
PED. OVERPASS**
Figure 15



TRAFFIC SIGNAL

EAST GRAND FORKS
US 2 CORRIDOR STUDY

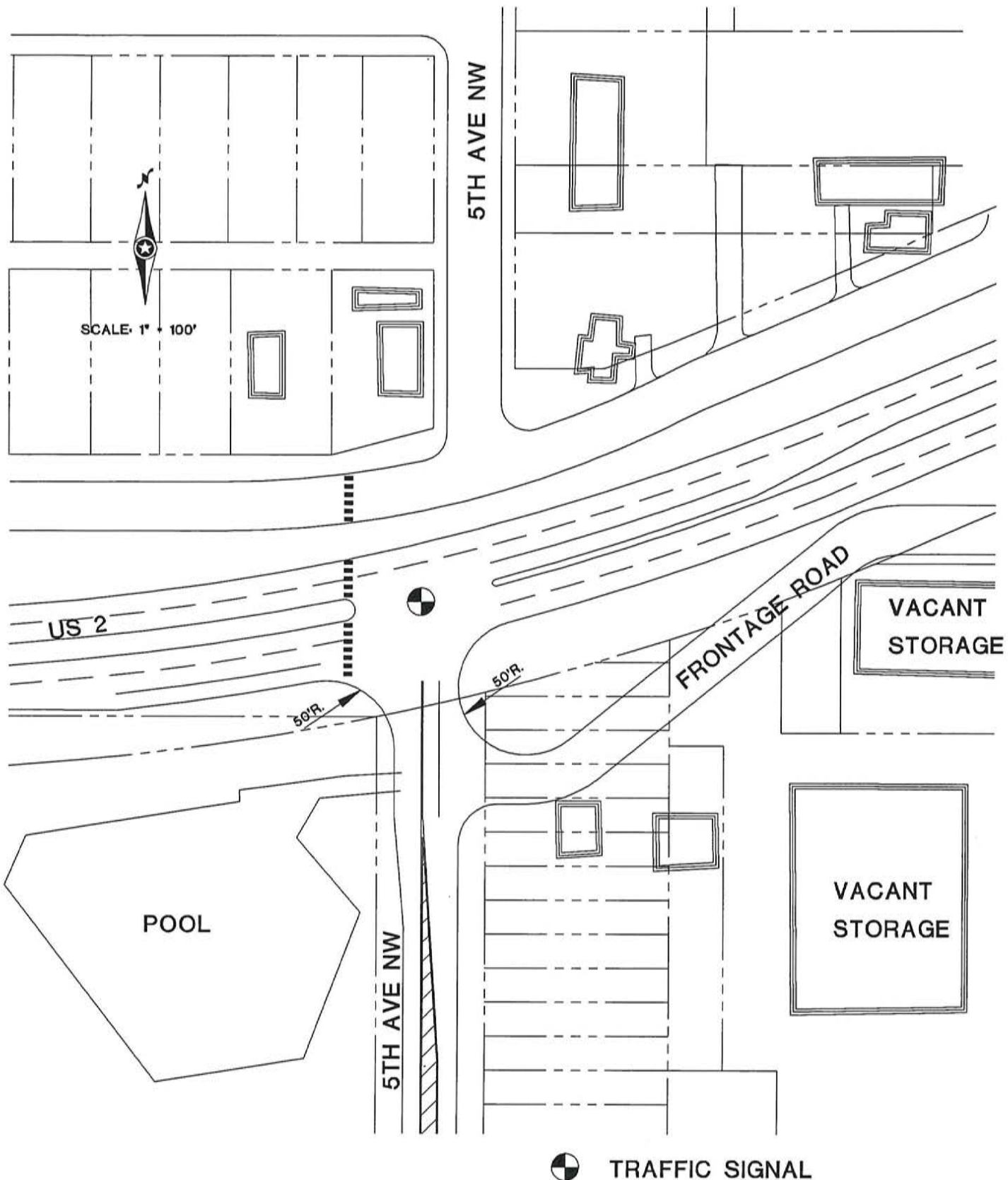
5th AVENUE NW
ALTERNATIVE B



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NORTH/SOUTH CONNECTION

Figure 16



EAST GRAND FORKS
US 2 CORRIDOR STUDY



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**5th AVENUE NW
ALTERNATIVE C
SOUTH CONNECTION**
Figure 17

should be provided for the expected future conditions. The number of lanes available are expected to handle year 2010 traffic projections without difficulty. As a result, no improvements are expected at this location.

Third Avenue Northeast

An intersection of Third Avenue Northeast and US Highway 2 does not exist today. Third Avenue Northeast on the north and the south side intersect a frontage road. By moving this intersection on the north farther to the east and on the south farther to the west, a connection can be made roughly centered between Fifth Avenue Northeast and Trunk Highway 220. This would accommodate left-turn storage and an eventual traffic signal. The alternatives studied are shown on Figures 18 and 19.

Alternative A illustrates a north-south connection and Alternative B shows a north connection only. Property would be required in order to accommodate either alternative, and this would need to be coordinated with the economic development plans of both properties. The need to center the Third Avenue Northeast connection between Trunk Highway 220 and Fifth Avenue Northeast should be emphasized. As long as this is done, the south connection can be made at a later date when conditions warrant.

The no-build alternative was not studied in as great a detail as were Alternatives A and B. The reason for this decision is that access to US 2 from Third Avenue Northeast is necessary to attract additional retail development.

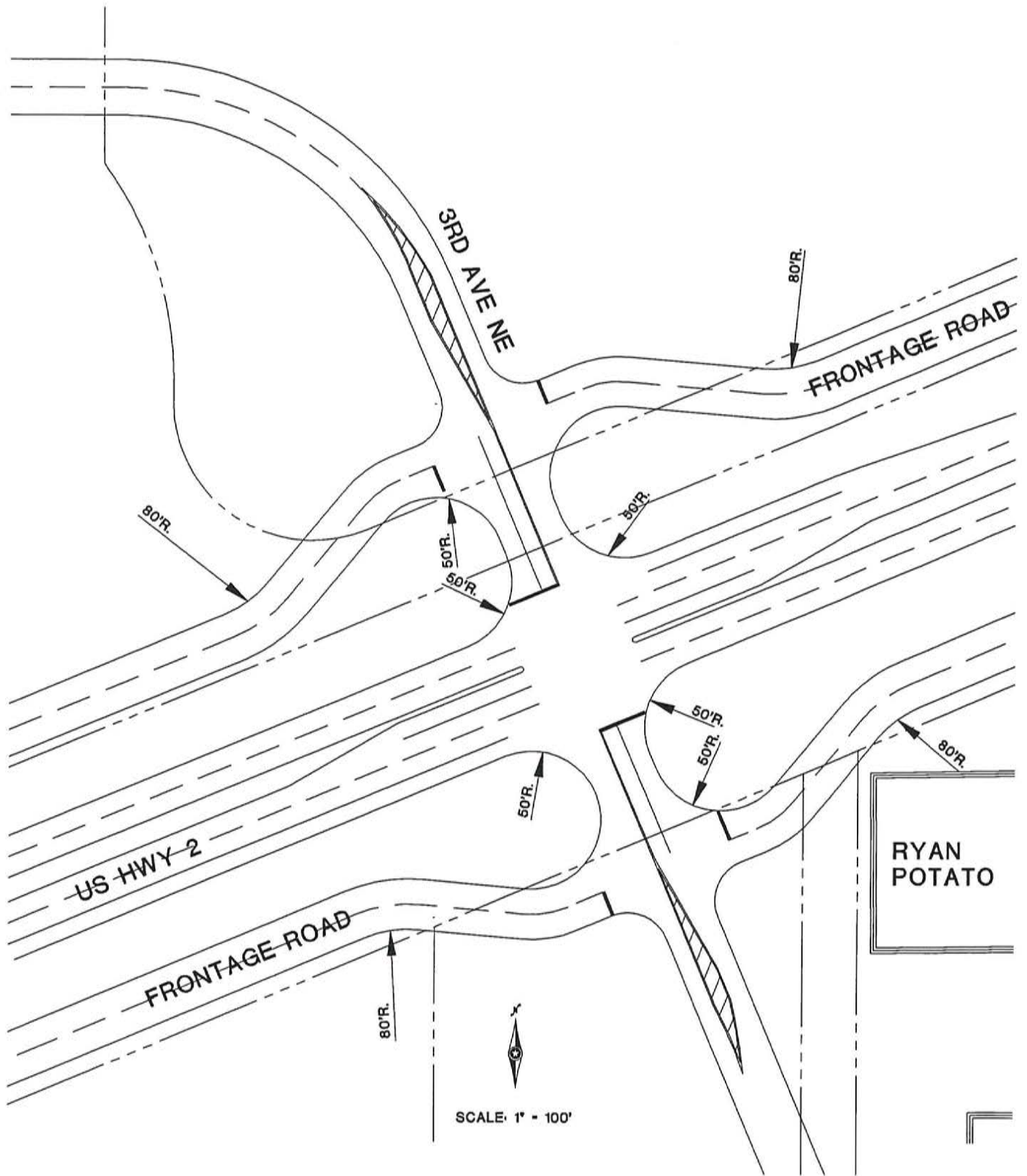
Fifth Avenue Northeast

The intersection of Fifth Avenue Northeast and US Highway 2 is very important to the City of East Grand Forks. Fifth Avenue Northeast is one of the few north-south streets that connect across US Highway 2 and across the Burlington Northern railroad tracks farther to the south. The intersection is not currently signalized, however, it is very close to meeting traffic signal warrants. Warrants will be met at such a time as further development occurs adjacent to the intersection or by increases in background traffic for US Highway 2. In either case, planning must begin now.

Of primary concern is the geometrics of the crossing at Fifth Avenue Northeast. By reconstructing this route to a more urban type crossing, the median area would be reconstructed to a flatter profile, which would allow for easier north-south travel. This, in conjunction with a traffic signal would provide for a more convenient intersection for vehicular and pedestrian traffic. Of primary importance, however, is the need to relocate frontage roads both north and south of US Highway 2. These frontage roads will need to be relocated approximately 100 feet back from the mainline in order to provide sufficient stacking room between the frontage roads and the highway. Figure 20 provides an illustration of the alternative investigated.

11th Avenue Northeast

Eleventh Avenue Northeast currently intersects US Highway 2 at a nonsignalized intersection. The street currently is very low volume and is gravel north of US Highway 2 and paved to the south. To the south of the highway, 11th Avenue Northeast is an important roadway serving the industrial area and the existing Comfort Inn. This



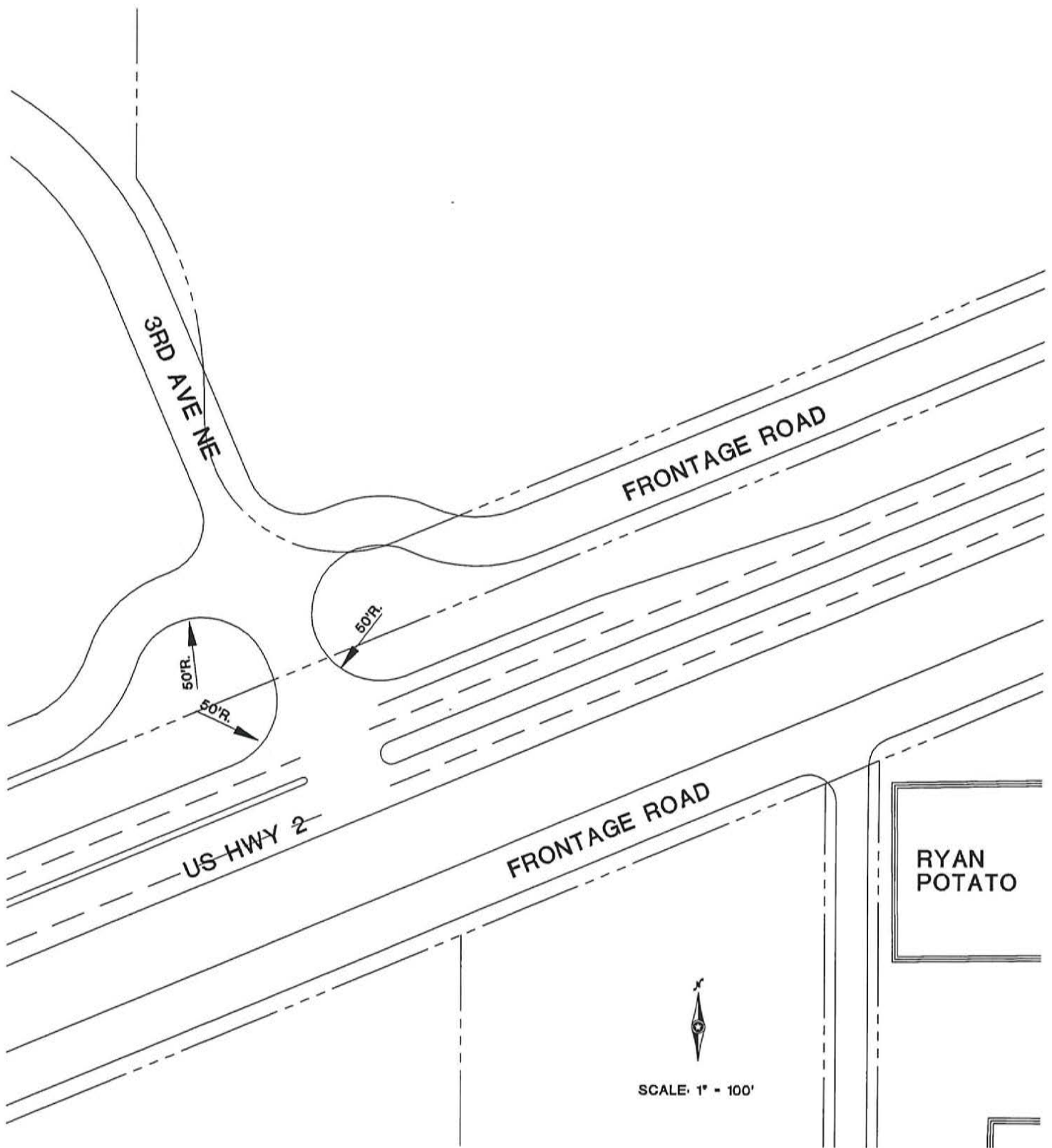
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**3rd AVENUE NE
ALTERNATIVE A
NORTH/SOUTH CONNECTION**

Figure 18

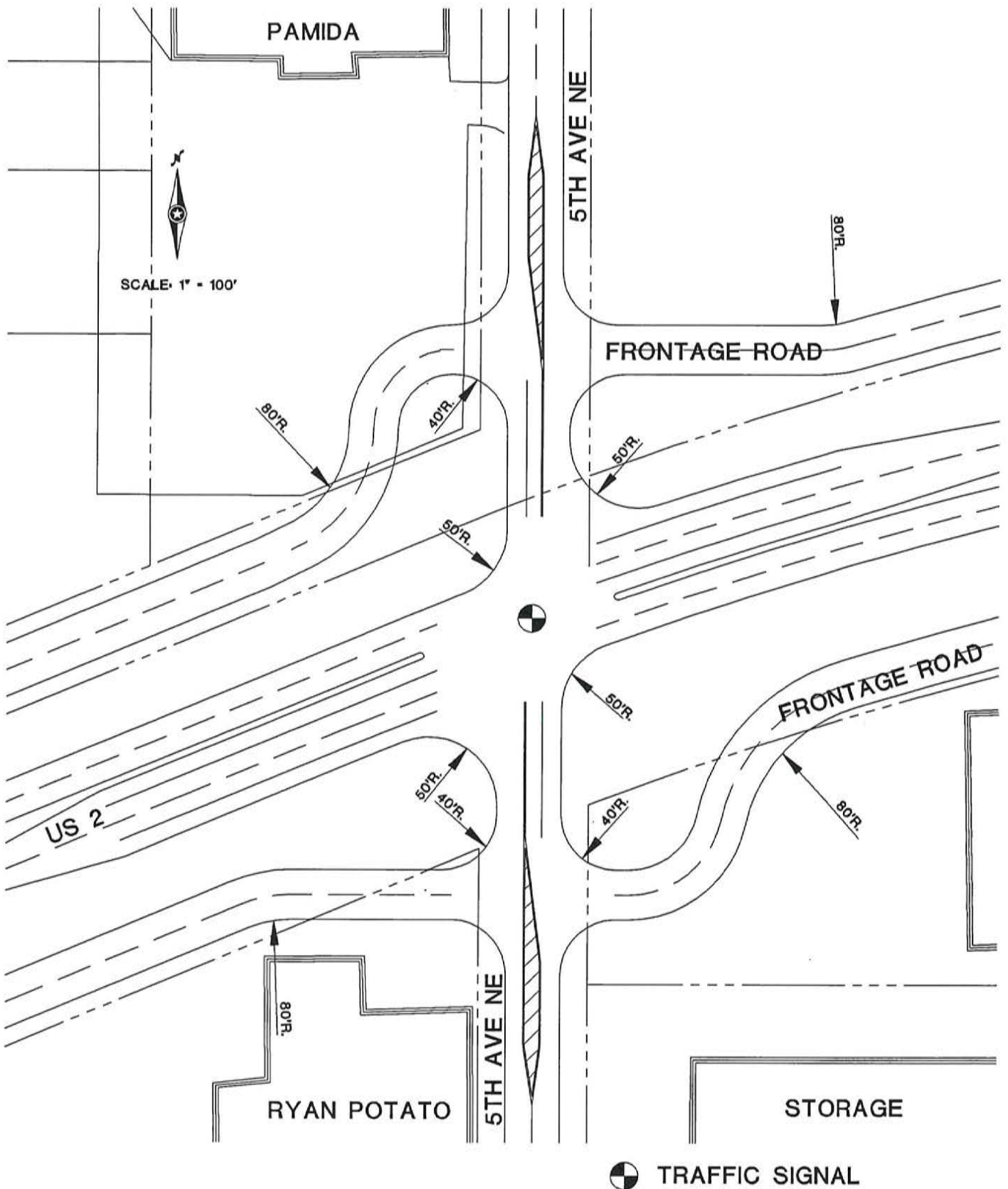


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 US 2 CORRIDOR STUDY



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**3rd AVENUE NE
 ALTERNATIVE B
 NORTH CONNECTION**
 Figure 19



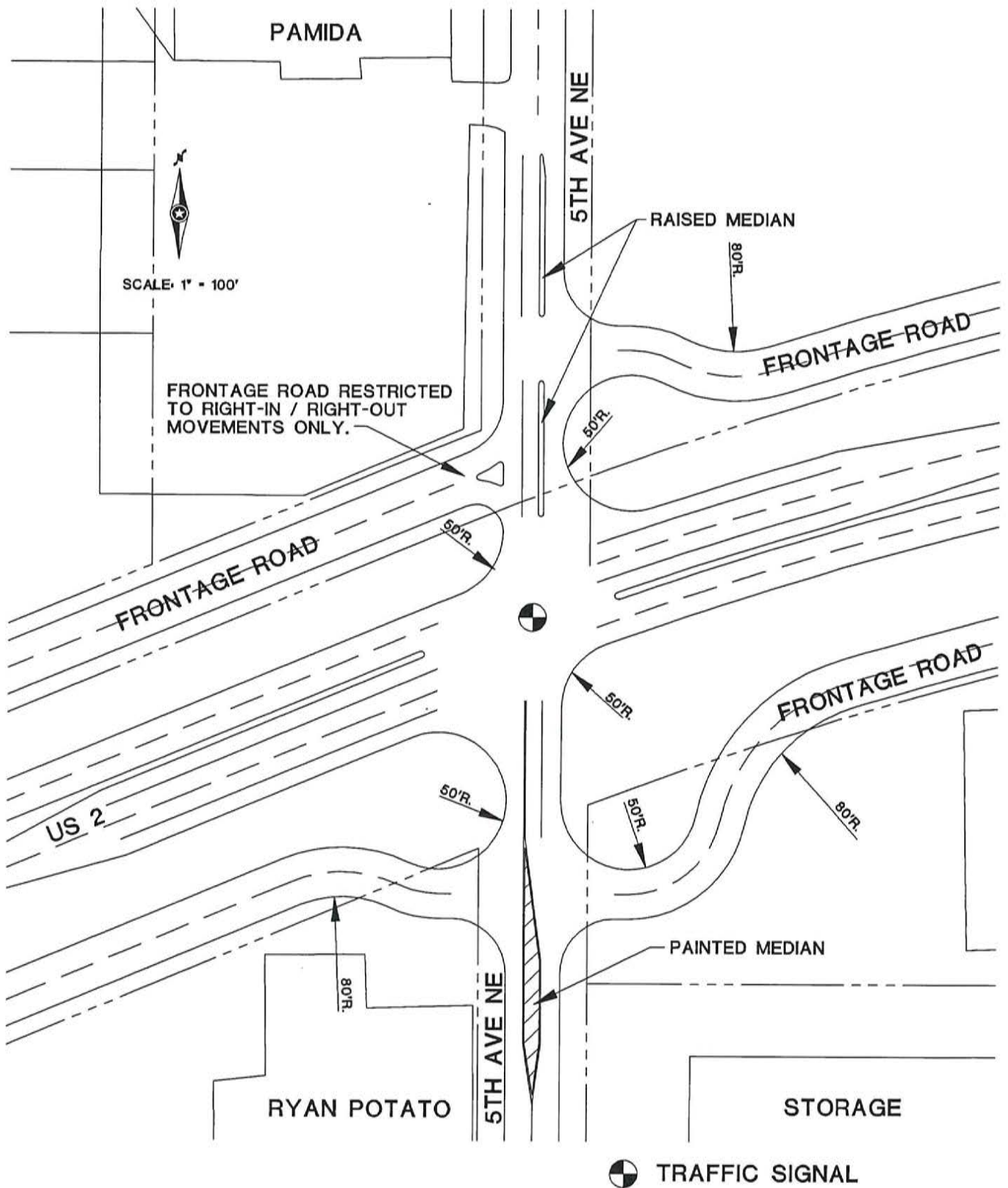
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**5th AVENUE NE
RELOCATE FRONTAGE
ROADS AND SIGNAGE**

Figure 20



EAST GRAND FORKS
US 2 CORRIDOR STUDY



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**5th AVENUE NE
FRONTAGE ROAD
ALTERNATIVE**

Figure 20B

industrial area will generate a tremendous amount of vehicular traffic at build-out including trucks, which will require improved access to the highway. In planning for this development, this intersection needs to be improved similar to the way Fifth Avenue Northeast is being scheduled to be improved. This includes the full urban style cross-section with flat medians and signalization when warranted. Figure 21 provides an illustration of the improvements investigated.

15th Avenue Northeast

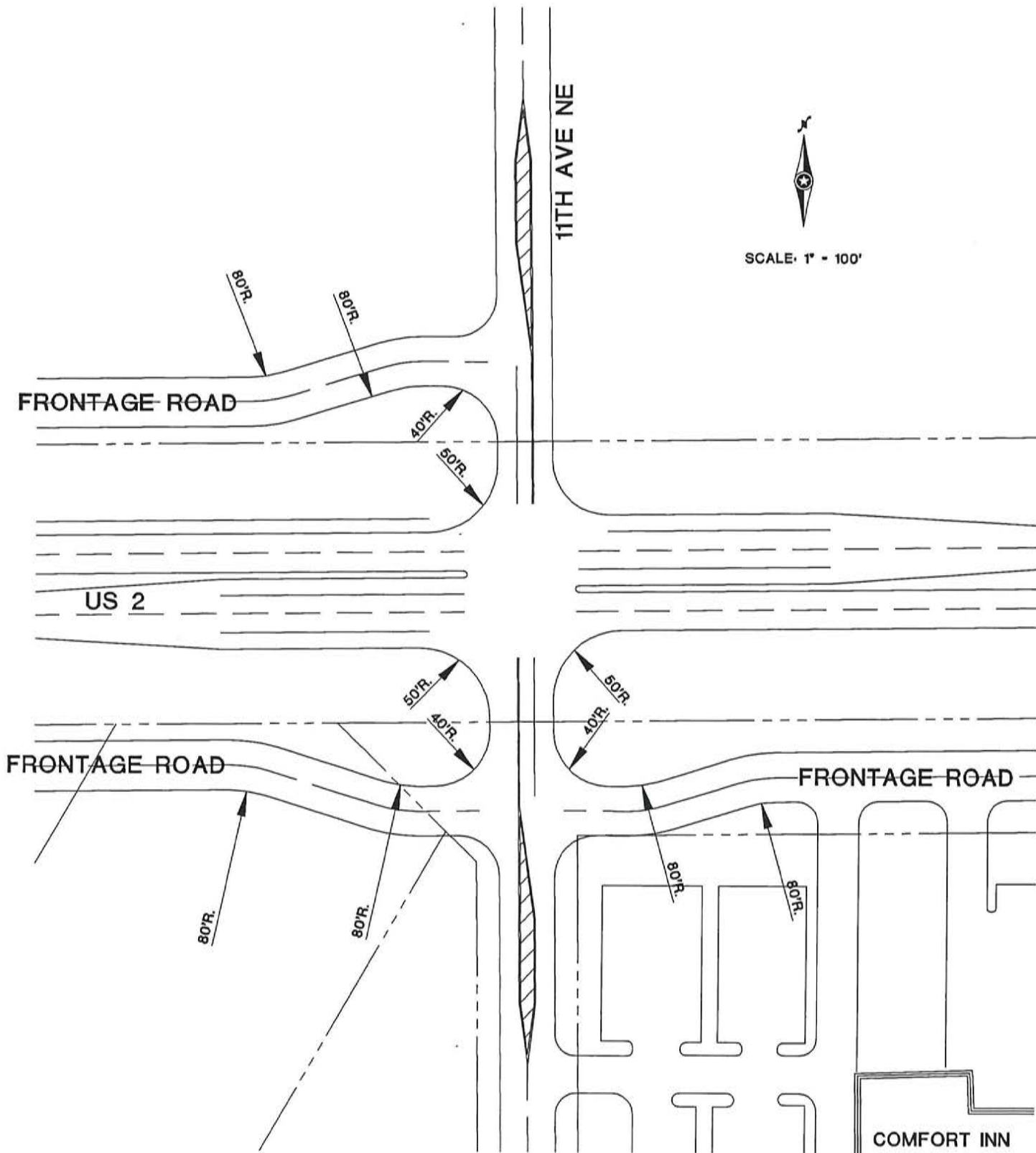
The intersection of 15th Avenue Northeast is very similar to that of 11th Avenue Northeast with the exception that it currently does not intersect US Highway 2. A large grain elevator is planned for the area south of US Highway 2 that will generate a significant amount of truck and other vehicular traffic. Ultimately, a full connection will be made and the usual requirements of modifying the frontage road connections and utilizing the urban type cross-section for US Highway 2 will be desired. This will require an amount of right-of-way acquisition. However, no existing developments will need to be relocated. Figure 22 is an illustration of the alternative studied.

Traffic Projections

Traffic was projected for the entire corridor using the transportation model prepared by the MPO. This network was modified by Barton-Aschman to provide for a more detailed look at the East Grand Forks area. The overall model did not include a detailed look at this area and was missing many collector and local streets that were critical to the analysis. Additionally, all traffic projections assume the US 2 bypass will be in place by the horizon year. If the bypass is not constructed, the improvements recommended in this document will be even more necessary. Figure 23 provides an illustration of the base network. After the network was calibrated and validated, traffic projections were prepared for a no-build configuration and four different alternatives with respect to the Fifth Avenue Northwest intersection. It was found that the alternatives involving River Road, Third Avenue Northeast, Fifth Avenue Northeast, 11th Avenue Northeast, and 15th Avenue Northeast did not significantly affect traffic volumes along the corridor and, therefore, no detailed analysis was completed.

Figure 24 illustrates the year 2010 traffic projections under the no-build condition. This is a situation that would exist if no improvements were made along the corridor or at any of the intersections described above. This is considered to be the base condition that other projections are compared to. Figure 25 illustrates the traffic projections with a south Fifth Avenue Northwest connection. By examining the illustration carefully, it is possible to see how traffic changes due to this connection. Figure 26 illustrates traffic projections with Fifth Avenue Northwest open both north and south. This connection has a significant affect on traffic patterns in the area with increases in traffic on Fifth Avenue Northwest and corresponding decreases in traffic on Fourth Street Northwest and DeMers Avenue.

Figures 27 and 28 illustrate traffic projections if a Greater Grand Forks Facility were constructed in the "BN Triangle" area. This facility was assumed to have a 1,500-stall parking area and room for approximately 3,000 people and exhibitors. In order to produce a worst case scenario, it was assumed that traffic would be entering the site during the evening peak hour. This traffic was then added to the surrounding street system to



EAST GRAND FORKS
US 2 CORRIDOR STUDY

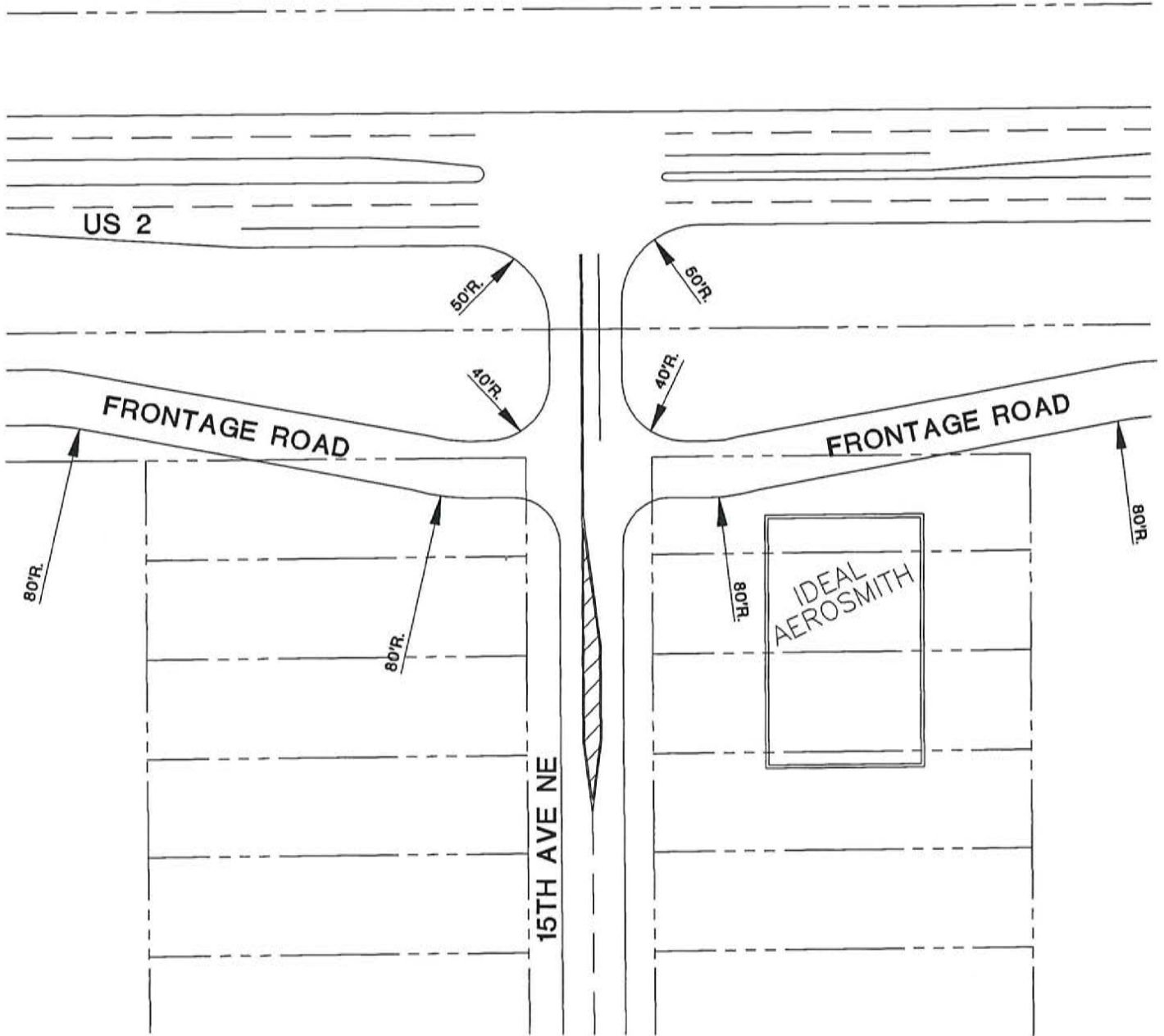


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11th AVENUE NE
RELOCATE FRONTAGE
ROADS
Figure 21



SCALE: 1" = 100'



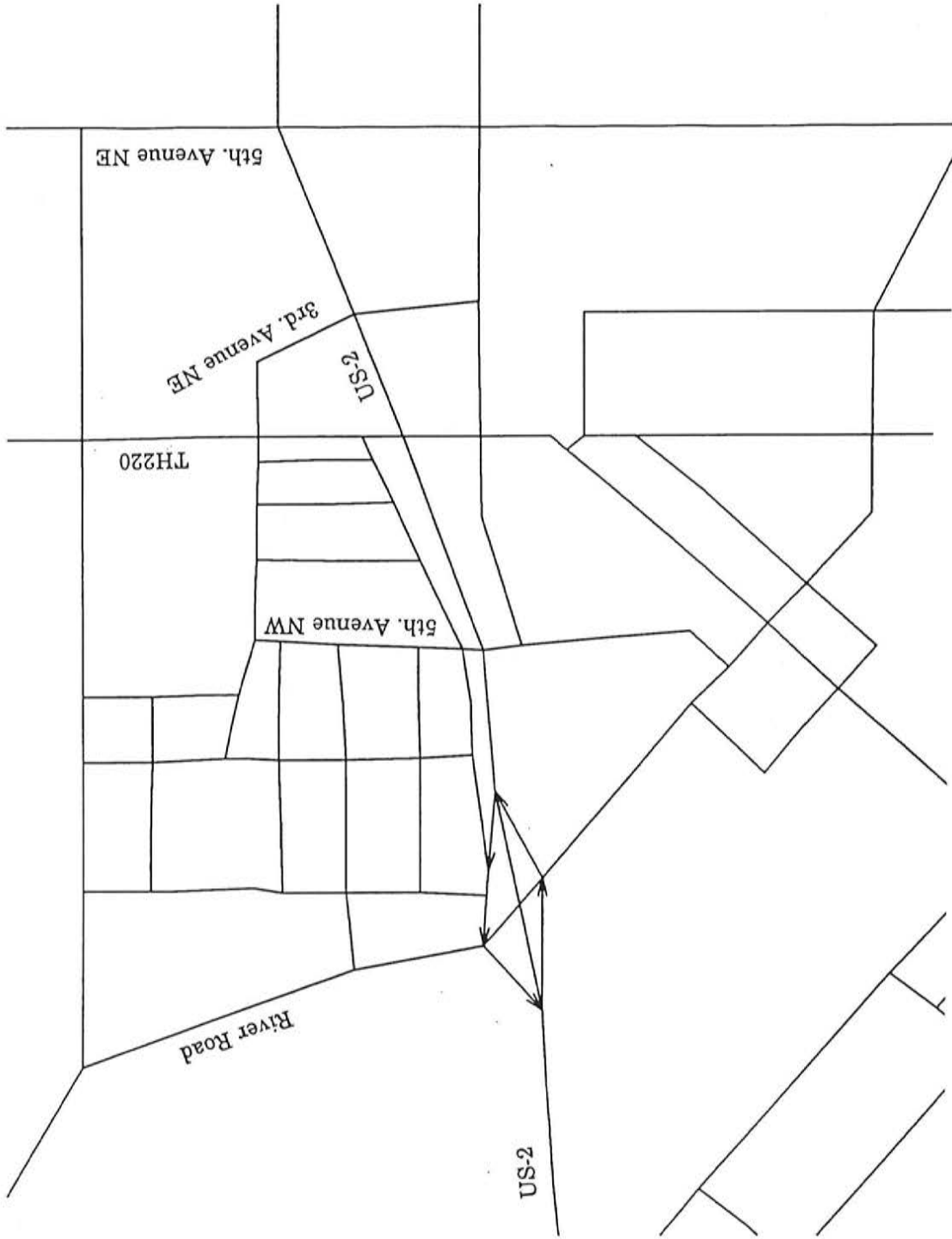
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15th AVENUE NE
RELOCATE FRONTAGE ROADS
AND CONNECT TO US 2

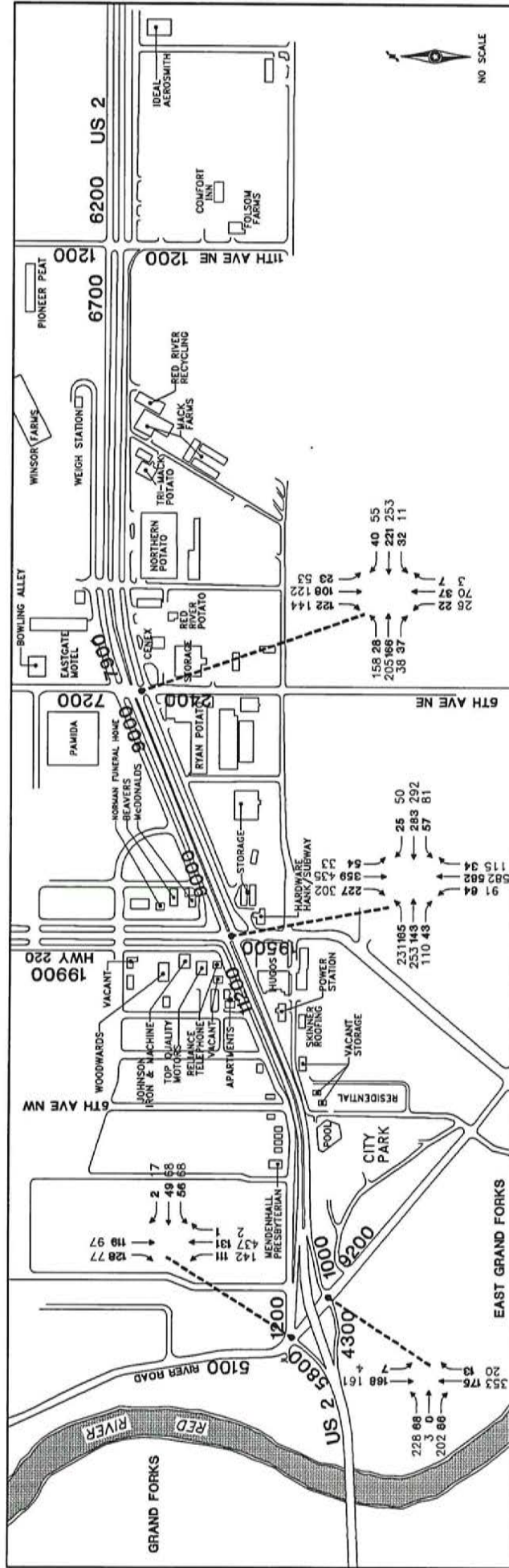


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Figure 22



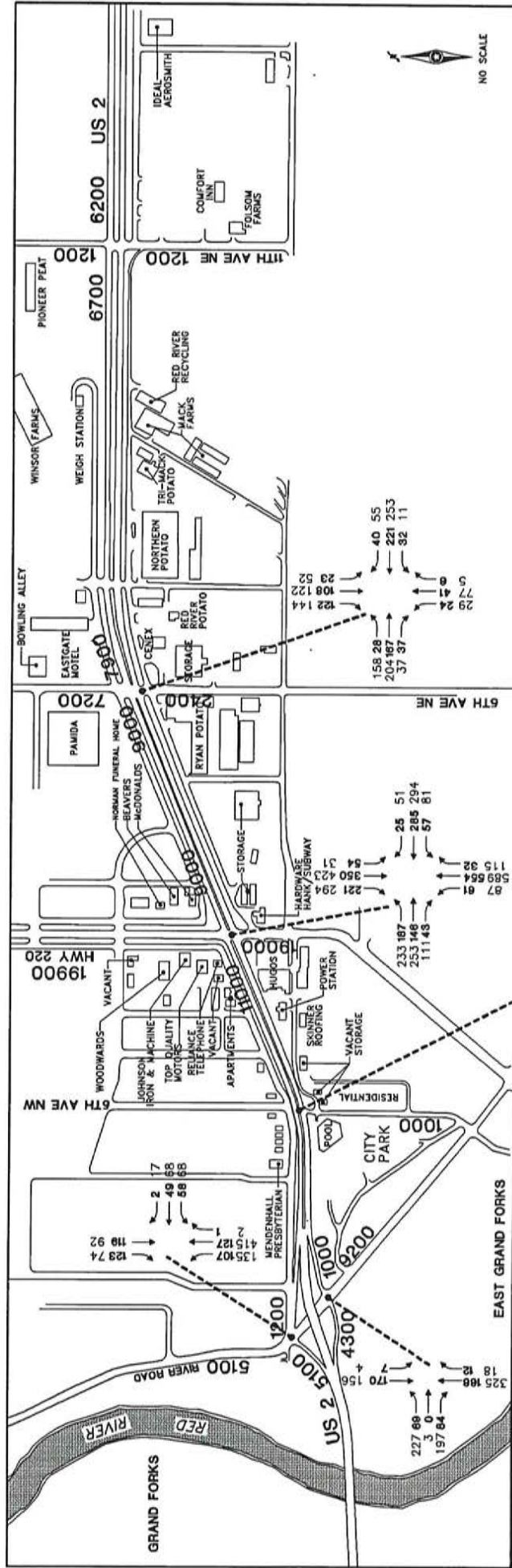
EAST GRAND FORKS • US 2 CORRIDOR STUDY
 2010 BASE NETWORK



EAST GRAND FORKS • US 2 CORRIDOR STUDY
TRAFFIC PROJECTIONS - NO BUILD

17800	2010 AVERAGE WEEKDAY DAILY TRAFFIC
99	2010 A.M. PEAK HOUR TURNING MOVEMENTS
99	2010 P.M. PEAK HOUR TURNING MOVEMENTS

FIGURE 24



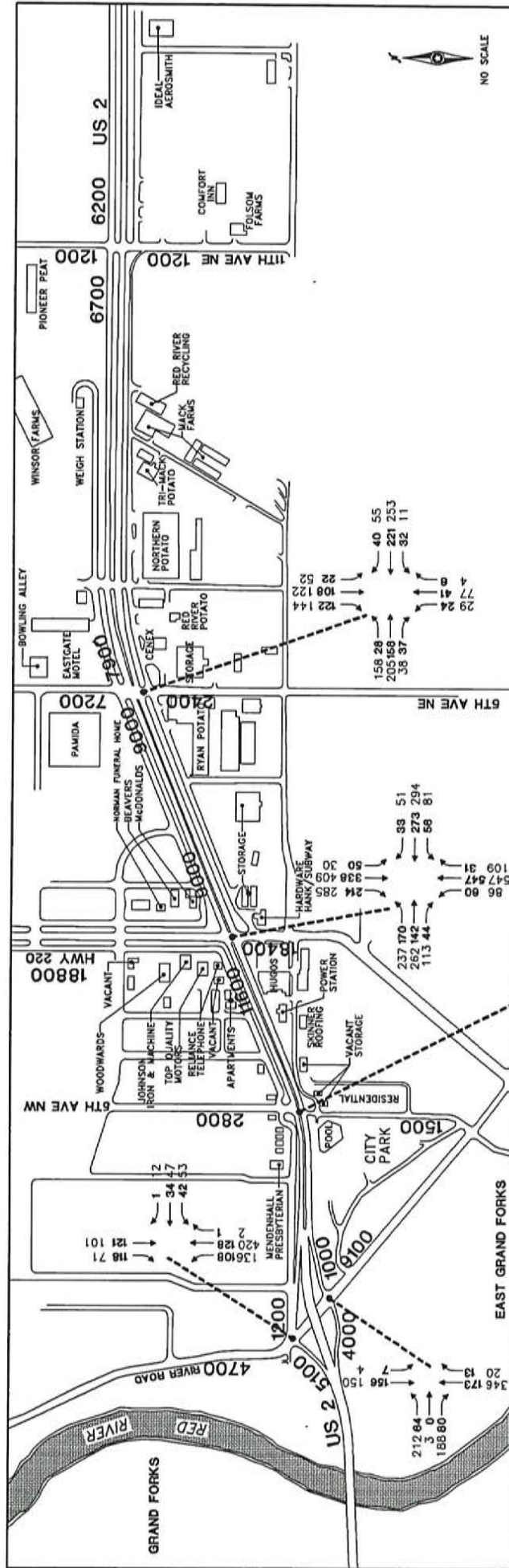
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TRAFFIC PROJECTIONS - WITH 5TH AVE NW SOUTH CONNECTION

17800 2010 AVERAGE WEEKDAY DAILY TRAFFIC

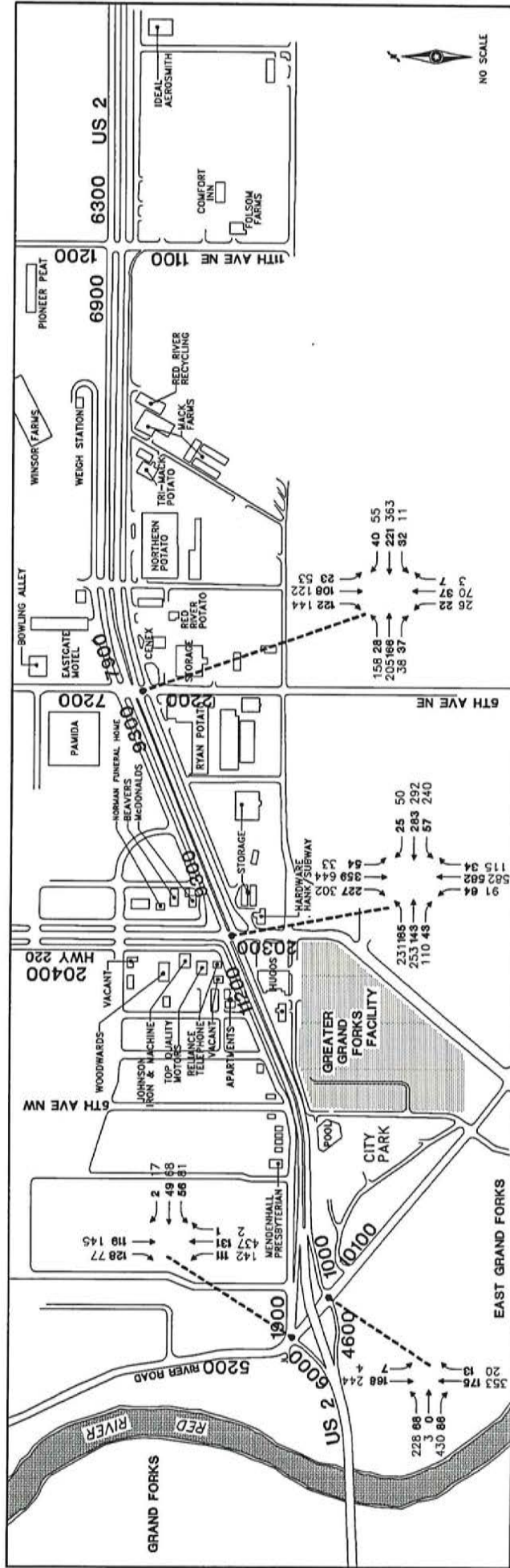
99 2010 A.M. PEAK HOUR TURNING MOVEMENTS

99 2010 P.M. PEAK HOUR TURNING MOVEMENTS



EAST GRAND FORKS • US 2 CORRIDOR STUDY
**TRAFFIC PROJECTIONS - WITH 5TH AVE NW
 NORTH / SOUTH CONNECTION**

17800	2010 AVERAGE WEEKDAY DAILY TRAFFIC
96	2010 A.M. PEAK HOUR TURNING MOVEMENTS
99	2010 P.M. PEAK HOUR TURNING MOVEMENTS



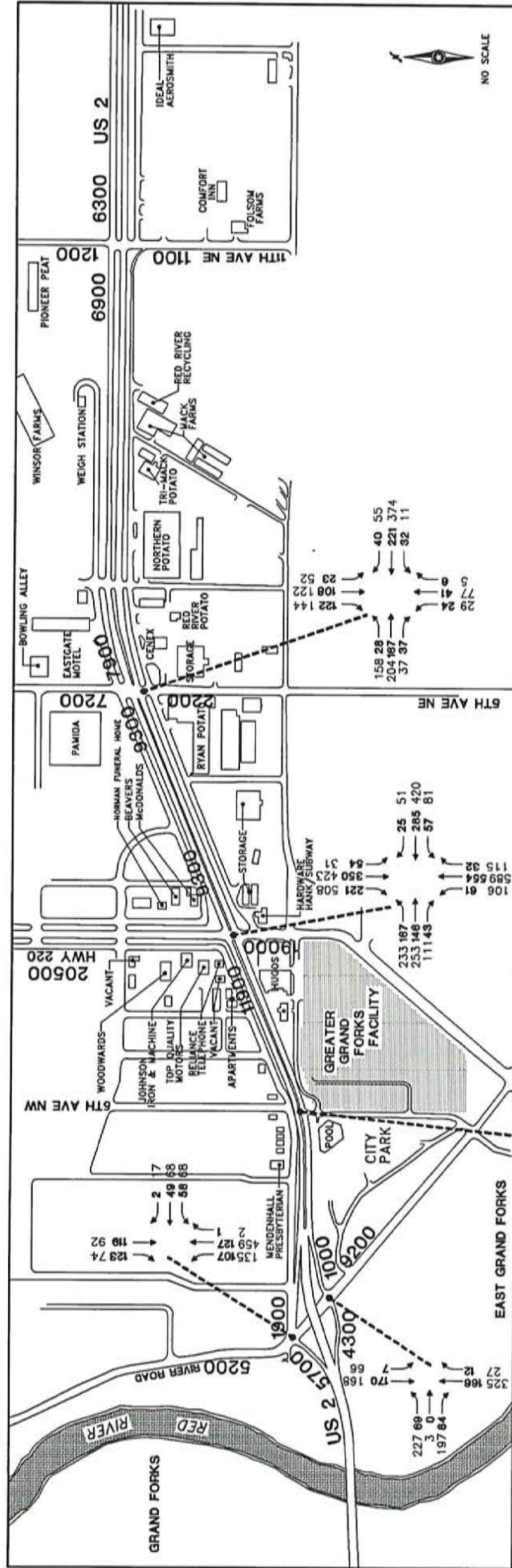
EAST GRAND FORKS • US 2 CORRIDOR STUDY

TRAFFIC PROJECTIONS - WITH GREATER GRAND FORKS FACILITY AND NO BUILD NETWORK

17800	2010 AVERAGE WEEKDAY DAILY TRAFFIC
99	2010 A.M. PEAK HOUR TURNING MOVEMENTS
99	2010 P.M. PEAK HOUR TURNING MOVEMENTS

FIGURE 27





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determine what effect this would have on overall traffic operations at key intersections. Figure 27 illustrates traffic projections with the Greater Grand Forks Facility and no changes to the existing network. Figure 28 illustrates traffic projections with the Greater Grand Forks Facility and a south Fifth Avenue Northwest connection. Because of the regional nature of the Greater Grand Forks Facility, it is unlikely that a significant amount of traffic will be using Fifth Avenue to the north of US 2. It is apparent by examining the two that the surrounding street system can handle the projected traffic increase with or without modifications at Fifth Avenue Northwest. With the connection, however, traffic is much better dispersed and accommodated at a higher level of convenience. Without the Fifth Avenue Northwest connection to the highway, traffic signals would likely be required at the River Road/US 2 interchange ramp terminals.

Level of Service Analysis

A level of service analysis was performed based on procedures outlined in the 1985 Highway Capacity Manual. The level of service is a qualitative measure of intersection operation. Level of Service A describes the most efficient condition while Level of Service F represents intersections at which traffic volumes exceed the intersection's capacity. A complete description of level of service is contained in Table 1.

TABLE 1 DESCRIPTION OF LEVELS OF SERVICE	
Level of Service	Description
A	Traffic moves freely. The free-flow condition is accompanied by low volumes. All waiting vehicles clear on one green phase. The major movements have a low percentage of stops (average delay per vehicle ≤ 5 seconds).
B	Traffic moves fairly freely. Volumes are still somewhat low. Waiting vehicles will still probably clear on one green phase. Traffic on this major movement can expect less than a 50 percent chance of stopping (average delay per vehicle ≤ 15 seconds).
C	Traffic moves smoothly. Volumes are beginning to increase. Some minor movements may not clear on one green phase. Traffic on the major movement can expect a 50 percent chance of stopping (average delay per vehicle ≤ 25 seconds).
D	Traffic approaching unstable flow. Acceptable intersection operation for peak periods. Many intersection movements may not clear on one green phase. Traffic on the major movement can expect a greater than 50 percent chance of stopping (average delay per vehicle ≤ 40 seconds).
E	Unstable traffic flow. Volumes are at or near capacity. No vehicles are able to go through the intersection without having to stop (average delay per vehicle ≤ 60 seconds).
F	Saturation condition. Volumes are over capacity. All vehicles will stop and will probably require more than one green phase (average delay per vehicle > 60 seconds).

The level of service at all key intersections was examined using year 2010 traffic projections and the alternatives discussed above. The results of that analysis is shown on Table 2.

TABLE 2 VOLUME-OVER-CAPACITY RATIO/LEVEL OF SERVICE YEAR 2010 TRAFFIC PROJECTIONS P.M. PEAK HOUR					
Alternative	River Road		5th Ave NW	TH 220	5th Ave NE
	North Ramp	South Ramp			
• No Build	.25/C	.35/C	*	.56/C	.45/C
• 5th Ave NW South Connection	.24/C	.33/C	.37/B	.51/C	.45/C
North/ South Connection	.21/C	.32/C	.50/C	.54/C	.45/C
• BN Triangle 1500 peak hour trips w/ South Connection at 5th Ave NW	.25/D	.43/D	.54/C	.59/C	.38C
1500 peak hour trips No Build	.28/D	.52/E	*	.57/C	.37/C

*Not Applicable

It should be noted that all of the intersections operate at a Level of Service C or better with minimum disruptions of traffic. The intersection of Fifth Avenue Northwest and Fifth Avenue Northeast was assumed to have traffic signals in place for the purposes of the analysis.

Construction Cost

The construction costs associated with the alternatives under study were determined by taking a planning-level look at the amount of right-of-way required and assumptions made with respect to utility relocation, pavement type, and traffic control device cost. These construction costs should be considered very preliminary and be used in an order of magnitude analysis rather than detailed project funding development. Table 3 summarizes the cost of each alternative.

**TABLE 3
CONSTRUCTION COST SUMMARY (DOLLARS)**

	Construction	Right-of-Way	Contingencies	Engineering	Total	
River Road	Alternative A Alternative B Alternative C	21,100 125,100 70,900	0 24,750 150,000	3,900 29,150 44,100	6,000 38,000 28,000	31,000 217,000 293,000
Fifth Avenue NW	Alternative A Alternative B Alternative C	406,000 218,400 212,100	63,850 312,600 82,800	94,150 106,000 59,100	125,000 81,000 67,000	639,000 718,000 421,000
Third Avenue NW	Alternative A Alternative B	215,300 98,200	227,800 160,500	88,900 51,300	76,000 37,000	608,000 347,000
Fifth Avenue NE	Alternative	242,700	159,000	95,300	84,000	581,000
11th Avenue NE	Alternative	116,700	154,200	54,100	42,000	367,000
15th Avenue NE	Alternative	80,900	7,500	17,600	24,000	130,000
Cost of Mainline Improvements	3,415,500	0	683,500	1,025,000	5,124,000	

ALTERNATIVE EVALUATION

Methodology

The menu of alternatives developed as part of this study required both objective and subjective analysis. The usual methods of determining objectively a preferred alternative involve determination of potential reduction in accidents and reduction in road user cost (stops, delay, fuel usage) that form the basis of a cost-benefit analysis. The greater the potential return on investment, the better the alternative. In this study, however, there were not any locations that would likely exceed the capacity of the existing intersections or roadway in the 20-year study period. There were some exceptions, however, as noted with potential uses of the "BN Triangle" area. If this were to become a greater Grand Forks facility, then there is a potential for congestion problems requiring improvements at the River Road/US Highway 2 interchange.

The safety aspects of the existing corridor are also within acceptable boundaries. The intersection of TH 220 and US 2 has experienced a total of 45 accidents over the past five and one-half years. This equates to an accident rate of just under 1.4 accidents per million entering vehicles. This is below the Minnesota average for the intersection of two principal arterial streets. The potentially greatest accident location is in the vicinity of Fifth Avenue Northwest. As mentioned previously, pedestrians, most of which are children, crossing at this location to get to and from the city park and swimming pool are not protected by any positive control. Therefore, the potential for accidents is greatest at this location.

An analysis was made where appropriate of the potential cost-benefit of a particular alternative. In addition to this, however, a significant effort was made to determine the opinions of the local staff and citizens. This was done by distributing questionnaires that initially weighted the criteria to be used for the evaluation process. Once the criteria was weighted, the citizenry, committee members, and staff members were asked to evaluate each alternative based upon a number system. By doing so, it was possible to obtain a consensus of the majority of those involved with the process as to which alternative should be selected for each area study.

Evaluation Criteria

The evaluation criteria included the following:

- Implementability
- Safety benefits
- Congestion reduction
- Impact on adjacent property and neighborhoods
- Construction cost
- Pedestrian circulation
- Economic impact
- Impact on adjacent transportation facilities

Weightings were then provided by those involved to determine the importance of each evaluation criteria. A questionnaire was developed from this weighting and listing of criteria. An example of the questionnaire and a summary of the evaluation weightings are shown in Tables 4a, 4b, and 4c.

**TABLE 4a
RIVER ROAD/ US 2 EVALUATION**

ALTERNATIVE EVALUATION CRITERIA	WT	Alternative											
		A			B			C					
		Score	WTD Score	WTD Score	Score	WTD Score	WTD Score	Score	WTD Score	WTD Score			
Implementability	3.5	4.9	17.2	3.2	11.2	2.4	8.4	4.9	17.2	3.2	11.2	2.4	8.4
Safety benefits	4.9	3.3	16.2	4.6	22.5	4.3	21.1	2.9	8.4	3.3	9.6	3.2	9.3
Congestion reduction	2.9	2.9	8.4	3.3	9.6	3.2	9.3	4.1	17.6	2.2	9.0	1.7	7.0
Impact on adjacent property and neighborhoods	4.1	4.3	17.6	2.2	9.0	1.7	7.0	4.6	21.2	2.1	9.7	2.1	9.7
Construction cost	4.6	4.6	21.2	2.1	9.7	2.1	9.7	4.1	14.8	3.5	14.4	3.6	14.8
Pedestrian circulation	4.1	3.6	14.8	3.5	14.4	3.6	14.8	4.1	13.1	3.0	12.3	2.7	11.1
Economic impact	4.1	3.2	13.1	3.0	12.3	2.7	11.1	2.9	8.1	2.6	7.5	2.8	8.1
Impact on adjacent transportation facilities	2.9	2.8	8.1	2.6	7.5	2.8	8.1	31.1	116.6		96.2		89.5
TOTAL	31.1		116.6		96.2		89.5		3.75		3.09		2.88
OVERALL SCORE													

Alternative A - Short term improvements; signing, channelization and striping
 B - Relocate ramp terminals to the south
 C - Relocate ramp terminals to the north

**TABLE 4b
5th AVENUE NW/ US 2 EVALUATION**

ALTERNATIVE EVALUATION CRITERIA	WT	Alternative								
		A			B			C		
		Score	WTD Score	WTD Score	Score	WTD Score	WTD Score	Score	WTD Score	WTD Score
Implementability	3.5	3.0	10.5	2.8	9.8	3.4	11.9			
Safety benefits	4.9	4.3	21.1	3.6	17.7	3.4	16.7			
Congestion reduction	2.9	2.3	6.7	3.9	11.3	3.1	9.0			
Impact on adjacent property and neighborhoods	4.1	3.1	12.7	2.2	9.0	2.5	10.3			
Construction cost	4.6	2.3	12.9	2.6	12.0	3.0	13.8			
Pedestrian circulation	4.1	4.1	16.8	3.8	15.6	3.4	13.9			
Economic impact	4.1	2.5	10.3	3.5	14.4	3.2	13.1			
Impact on adjacent transportation facilities	2.9	2.8	8.1	3.9	11.3	3.1	9.0			
Cost/benefit analysis	4.0	2.8	11.1	3.8	15.2	3.4	13.6			
TOTAL	35.1		110.2		116.3		111.3			
OVERALL SCORE			3.13		3.31		3.17			

Alternative A - Pedestrian Overpass
 B - North/ South Connection
 C - South Connection

TABLE 4c
3rd AVENUE NE/ US 2 EVALUATION

ALTERNATIVE EVALUATION CRITERIA	WT	Alternative			
		A		B	
		Score	WTD Score	Score	WTD Score
Implementability	3.5	2.2	7.7	4.4	15.4
Safety benefits	4.9	3.0	14.7	3.4	16.7
Congestion reduction	2.9	3.2	9.3	3.6	10.4
Impact on adjacent property and neighborhoods	4.1	3.1	13.7	4.1	16.8
Construction cost	4.6	2.7	12.4	3.3	15.2
Pedestrian circulation	4.1	3.2	13.1	3.0	12.3
Economic impact	4.1	3.9	16.0	3.9	16.0
Impact on adjacent transportation facilities	2.9	3.7	10.7	3.6	10.4
TOTAL	31.1		96.6		113.2
OVERALL SCORE			3.11		3.64

Alternative A - North/ South Connection
 B - North Connection

Fifth Avenue Northwest Cost/Benefit Analysis

Connecting Fifth Avenue Northwest to US Highway 2 caused significant changes in traffic patterns for the corridor. These changes resulted in impacts to residential streets north and south of US Highway 2, the intersection of River Road and US Highway 2, and TH 220 and US Highway 2. Having a connection at Fifth Avenue Northwest served to reduce overall travel by having more direct connections to origins and destinations. It also reduced the overall travel time for many residents of East Grand Forks. As a result, it was necessary to evaluate this intersection at a greater level of detail than the others along the corridor. No other intersection alternative had as significant an impact on overall circulation or traffic volumes.

It was determined that a cost-benefit analysis of the three alternatives under study would be appropriate. The three alternatives studied were the no-build alternative, alternative with a north-south connection, and alternative with just a south connection to US Highway 2. The pedestrian overpass alternative was not analyzed further because there was no change or improvement in vehicular traffic patterns that would allow for direct comparison of reduced travel or time. The pedestrian overpass would improve pedestrian safety, however, no improvement could be legitimately predicted since there have been no recorded pedestrian accidents.

The cost of the north-south connection and the south connection alternatives are documented in Table 3. These costs are on the high side because they include a 25-percent allowance for engineering, legal, and administrative costs plus a 20 percent contingency. At this level of analysis, such overestimation is appropriate. The benefits of each alternative were determined by looking at the total daily vehicle-miles traveled in the year 2010 and comparing that with the no-build configuration. Obviously, with more connections to US Highway 2, travel would be more direct to areas north and south of the corridor and a reduced amount of vehicle-miles traveled could be expected. The same is obviously true of the amount of vehicle-hours traveled.

These daily improvements in circulation were then multiplied over the 20-year expected life of the project using a sliding scale beginning with 1993 traffic. The total benefits of reduced travel and reduced time were added together and compared to costs over the same time period. The benefits calculations were determined by assuming that the value of time saved was equal to seven dollars per hour and the cost to operate a vehicle was 28 cents per mile. These figures were distributed using a five percent discount rate and assuming 312 days per year. The results of the analysis are shown in Table 5. Under this analysis, the north-south connection appears to provide the greatest benefit-cost ratio at 0.77 versus 0.70. Again, this should be considered a conservative estimate based upon the high construction costs and relatively low value of time and vehicle cost.

The fact that the benefit-cost ratios are not greater than one would normally indicate that a project is not feasible. This analysis should be considered an order of magnitude comparison of the two alternatives based upon improvement to circulation. More accurate cost estimates, safety benefits, fuel usage, stops and delay would have to be analyzed to provide a reliable test of feasibility.

**TABLE 5
FIFTH AVENUE NW BENEFIT/COST RATIOS
BUILD VS. NO BUILD**

Alternative	Total Daily VMT ¹ (2010)	Total Daily VHT ² (2010)	Net Present Value Savings ³ (\$)	Construction Costs ⁴ (\$)	Benefit/Cost Ratio
No Build	1,126,667	36,243	N/A	N/A	N/A
North/South Connection	1,126,040	36,223	614,000	800,000	0.77
South Connection	1,126,299	36,235	310,000	444,000	0.70

¹ Vehicle miles traveled

² Vehicle hours traveled

³ Net present value of savings:
time value = \$7.00/hour
vehicle cost = \$0.28/mile
20-year project life
5% discount rate
312 days per year

⁴ Includes 25% allowance for engineering, legal, and administrative costs

Summary of Alternative Rankings

The results of the questionnaires sent out to evaluate each intersection alternative were tabulated and are summarized in Tables 4a, 4b, and 4c. This summary is used as the basis for the determination of the recommended improvements for the corridor.

RECOMMENDED IMPROVEMENTS

The following is a brief description of the improvements recommended by the study process. The improvements are illustrated on Figure 29 and are more further described in the following.

River Road

The River Road/US 2 interchange is currently operating at acceptable levels of service and will likely continue to operate at this level unless further development occurs in either the "BN Triangle" or downtown area, which may overload the two ramp terminals. Deficiencies exist with respect to the angle of intersection of the ramp terminals, sight distance, and signing and striping. The improvements shown in Alternative A for River Road are recommended to handle short-term deficiencies. As time goes on, it may be necessary to rebuild the ramps according to Alternative B or C. This, of course, would be done under the context of evaluating the structural soundness of the River Road bridge and other considerations. If it is decided that the bridge should be replaced, then a full reconstruction should be considered, which might actually change the north-south alignment to eliminate the geometric deficiencies of the ramp terminals.

Fifth Avenue Northwest

It has been determined that Fifth Avenue Northwest should be connected to US Highway 2 both north and south. This would provide much needed circulation to the area north of US Highway 2 and also provide access to potential economic development areas to the south. Constructing this intersection would require the purchase of homes north and south of US Highway 2 and the installation of a traffic signal. This would provide much needed protection for motorists and pedestrians crossing the highway.

Trunk Highway 220

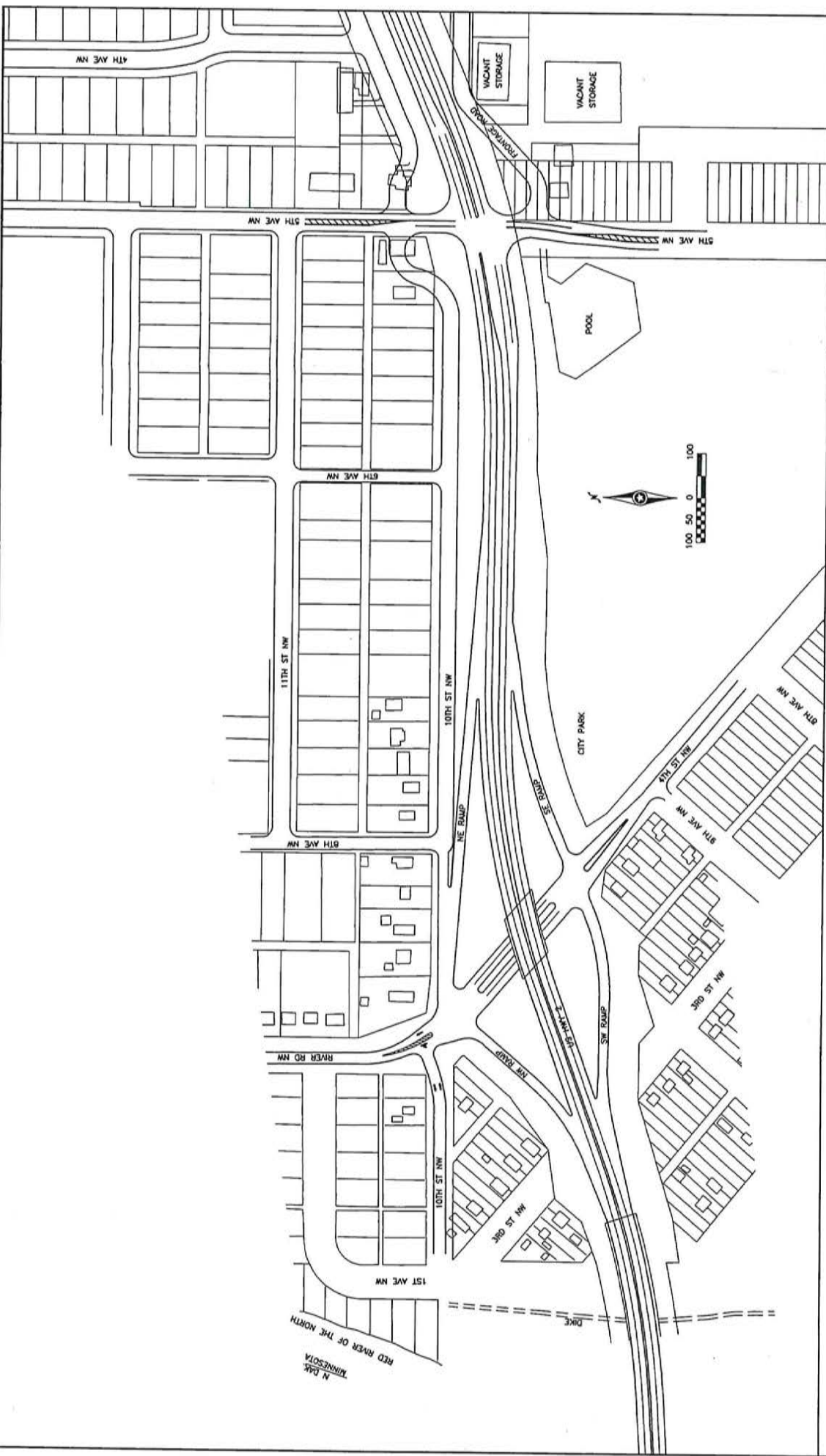
The intersection of Trunk Highway 220 and US 2 will not require significant upgrading within the 20-year life of this study. It is expected that this intersection will operate at a Level of Service C or better for the foreseeable future. This is especially true if the expected north bypass route is constructed.

Third Avenue Northeast

The intersection of Third Avenue Northeast should be connected north of US Highway 2. The intersection should be located somewhere near the halfway point between Fifth Avenue Northeast and Trunk Highway 220. This would allow suitable stacking distance for left turns eastbound and westbound at these two intersections. Allowing a northerly access to TH 220 from Third Avenue Northeast would provide economic benefit to the retail area north of US Highway 2 and between TH 220 and Fifth Avenue Northeast. This area is prime for development, and ease of access is but one component that will encourage its near term success. The spacing of this intersection with respect to others should allow for safe and convenient operation that will not require signalization in the foreseeable future.

Fifth Avenue Northeast

The intersection of Fifth Avenue Northeast and US Highway 2 should be reconstructed to allow for smoother north-south travel across the existing highway and to allow for

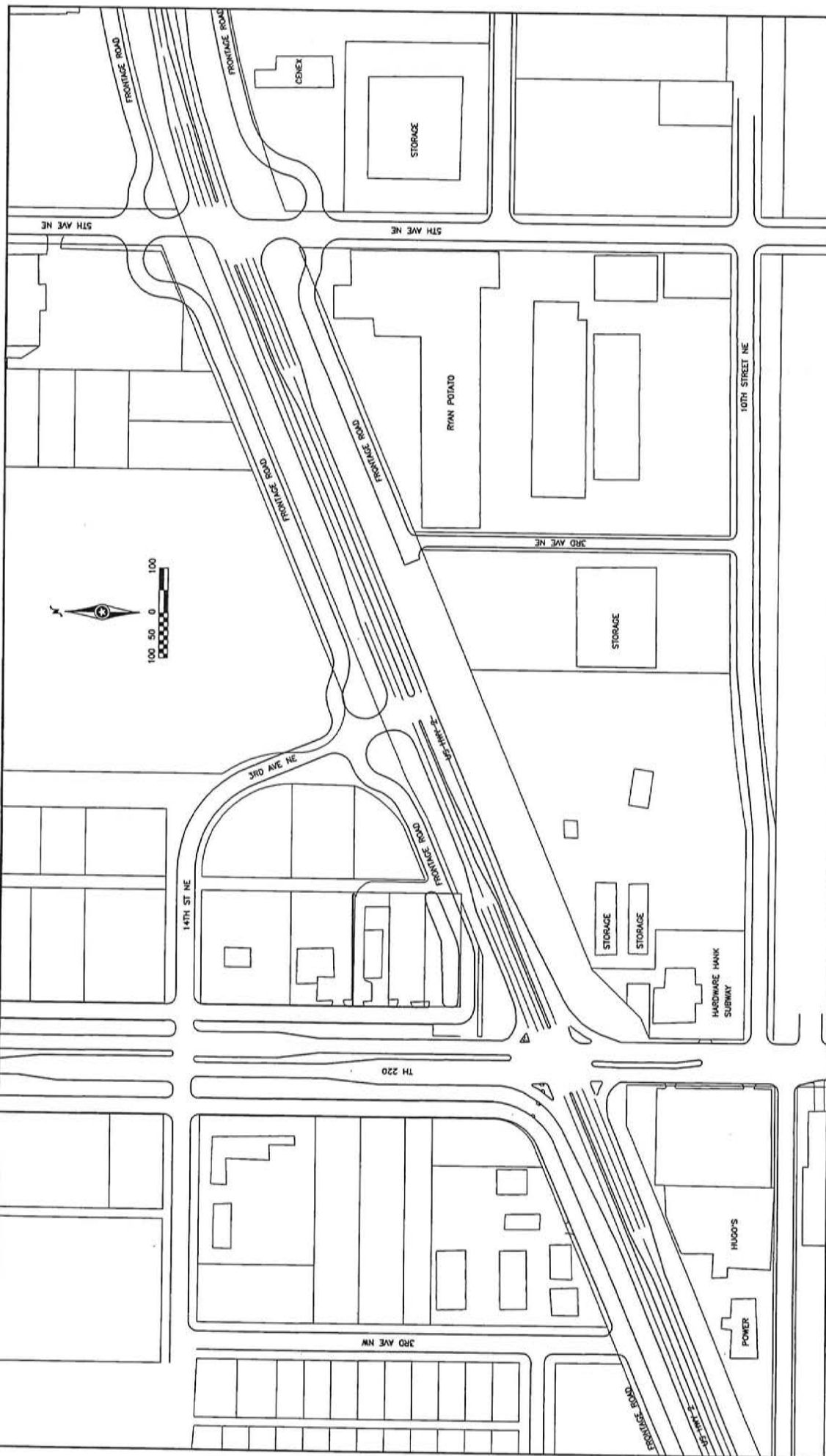


EAST GRAND FORKS, MINNESOTA
US 2 CORRIDOR STUDY

RECOMMENDED IMPROVEMENTS
Figure 29A

Barton-Aschman Associates, Inc.
111 Third Ave. S., Suite 350 Minneapolis, MN 55401
Persons Transportation Group



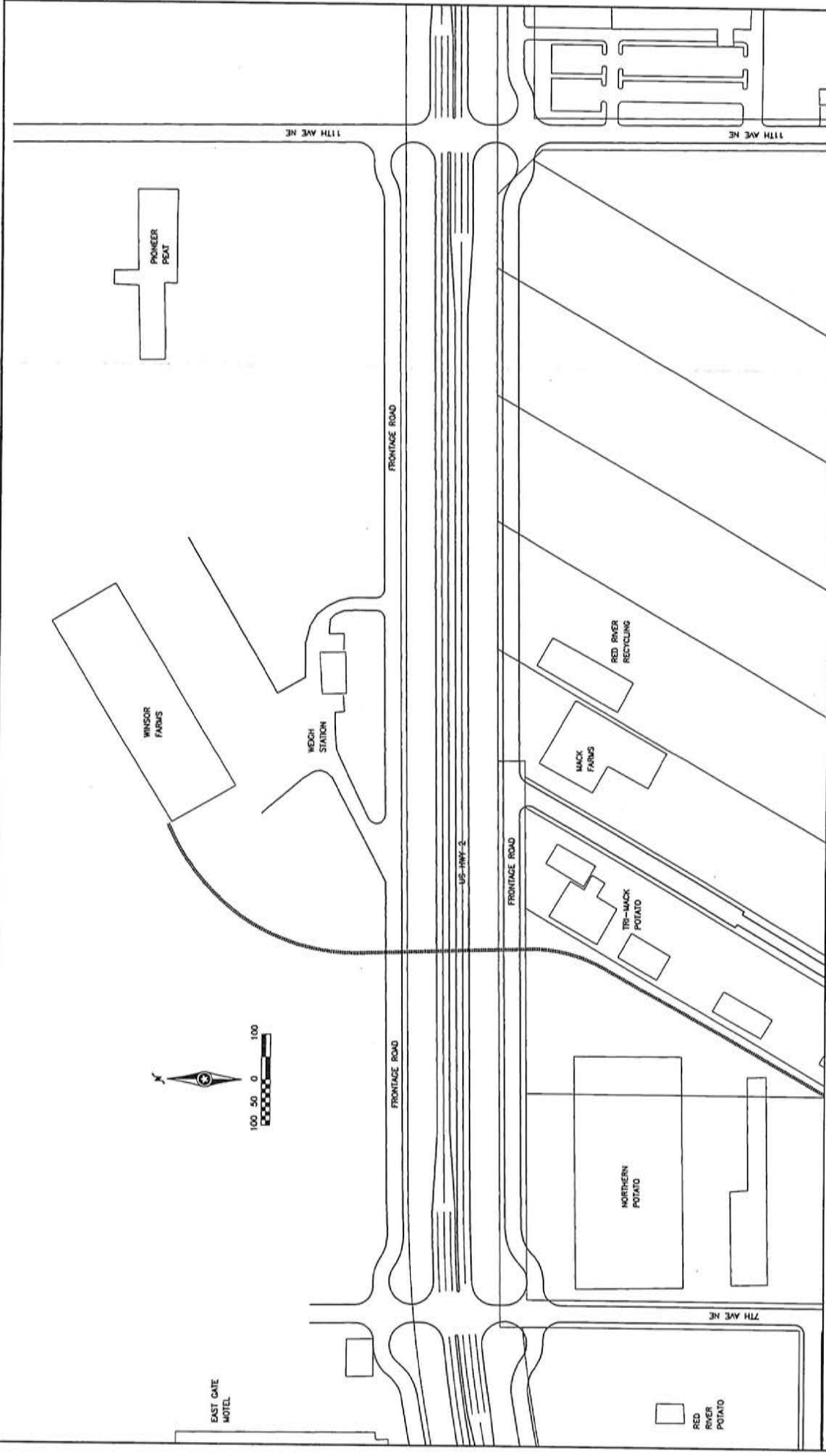


EAST GRAND FORKS, MINNESOTA
 US 2 CORRIDOR STUDY

RECOMMENDED IMPROVEMENTS
 Figure 29B

Barton-Aschman Associates, Inc.
 211 Third Ave. S., Suite 350 Minneapolis, MN 55401
 Parsons Transportation Group



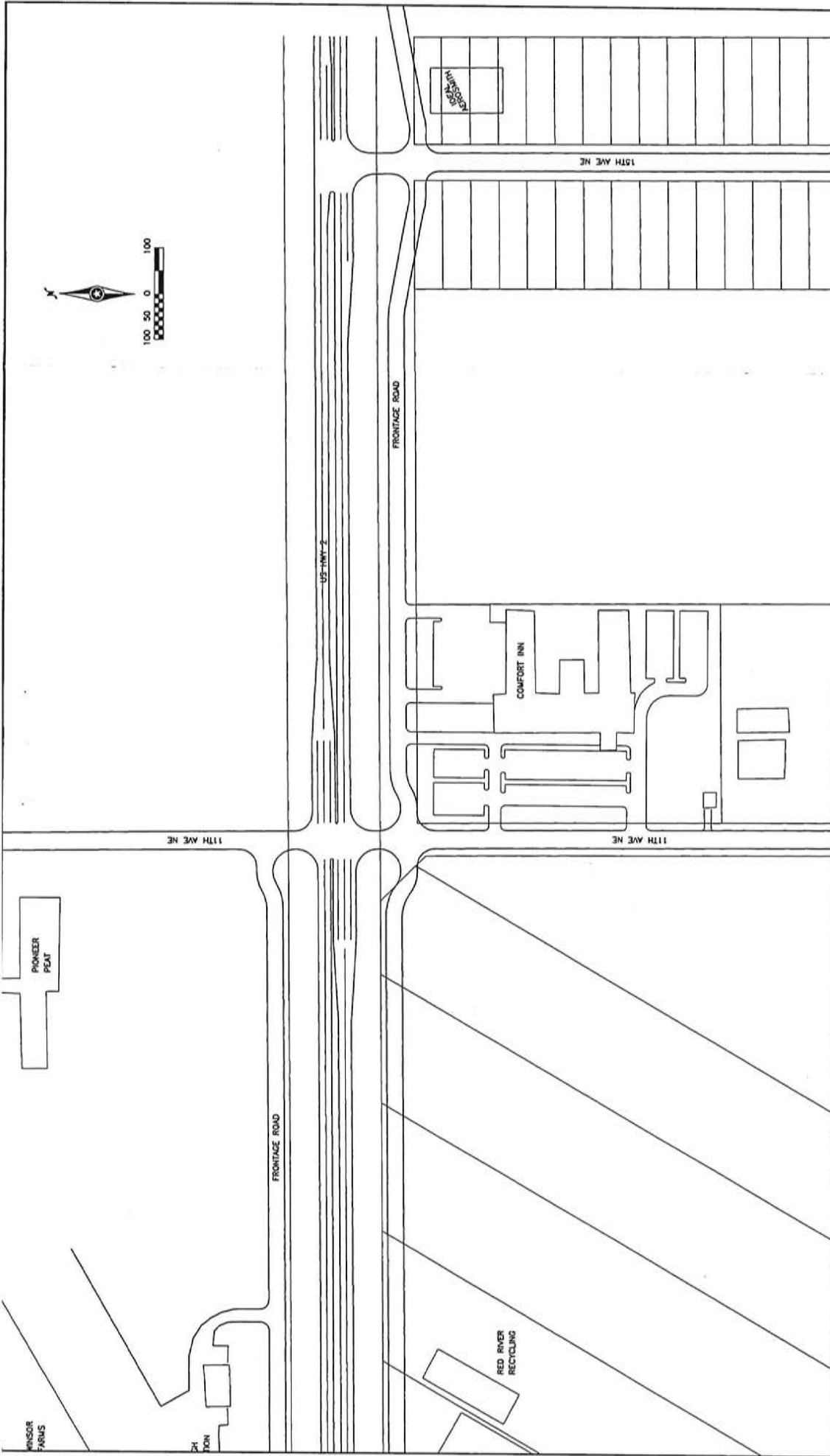


EAST GRAND FORKS, MINNESOTA
US 2 CORRIDOR STUDY

RECOMMENDED IMPROVEMENTS
Figure 29C

Barton-Aschman Associates, Inc.
111 Third Ave S., Suite 150
St. Cloud, MN 55701
Persons Transportation Group





EAST GRAND FORKS, MINNESOTA
 US 2 CORRIDOR STUDY

RECOMMENDED IMPROVEMENTS
 Figure 29D

Barton-Aschman Associates, Inc.
 111 Third Ave. S., Suite 350
 Minneapolis, MN 55401
 Parsons Transportation Group



signalization. This will require moving the frontage roads, which are adjacent to US Highway 2, back a minimum of 100 feet for appropriate stacking.

Railroad Crossing Between Seventh Avenue Northeast and 11th Avenue Northeast

This is a spur track, which should be removed at the earliest possible time frame. The existing track confuses motorists because it commands attention that really is not necessary. The railroad track also should be removed to allow for a smoother paving surface and reduced overall maintenance.

Seventh Avenue Northeast

Seventh Avenue Northeast will require only minor modification to move the existing frontage roads back a minimum of 100 feet from mainline US Highway 2. This intersection will not require signalization in the near future.

11th Avenue Northeast

The comments made regarding Seventh Avenue Northeast also apply to 11th Avenue Northeast. Additionally, modifications will be required to the median area in order to allow smooth north-south travel.

15th Avenue Northeast

The intersection of 15th Avenue Northeast currently does not intersect US Highway 2. In the long-range plans, 15th Avenue Northeast should intersect with US Highway 2 to facilitate heavy truck movements within the industrial area. Direct access to 15th Avenue Northeast would serve the St. Hillaire grain elevator area and other industrial uses. This could only be seen as a positive move to accommodating the economic development of this area.

Bike Paths

Bike paths should be constructed along the route as indicated on Figure 11. As much as possible, the bike paths should be disconnected from the roadway system and be independent of both the frontage roads and the mainline. In the area between Fifth Avenue Northwest and TH 220, however, this is not possible, and the bike paths should be incorporated into the north frontage road as indicated on Figure 11.

Landscaping

The entire corridor should be landscaped where possible. It is recommended that the median area be wide enough (18 feet minimum) to accommodate low shrubs and/or grassed areas. The area between the frontage roads and the mainline should also be landscaped with trees or other shrubbery. East of TH 220, it should be possible to plant deciduous trees in this area and maintain a minimum 20- to 30-foot setback from mainline US Highway 2. West of TH 220, however, it is likely not possible to plant trees and also maintain the minimum clear zone. Therefore, in this area, low shrubs or grassed landscaping should be applied.

Signalization

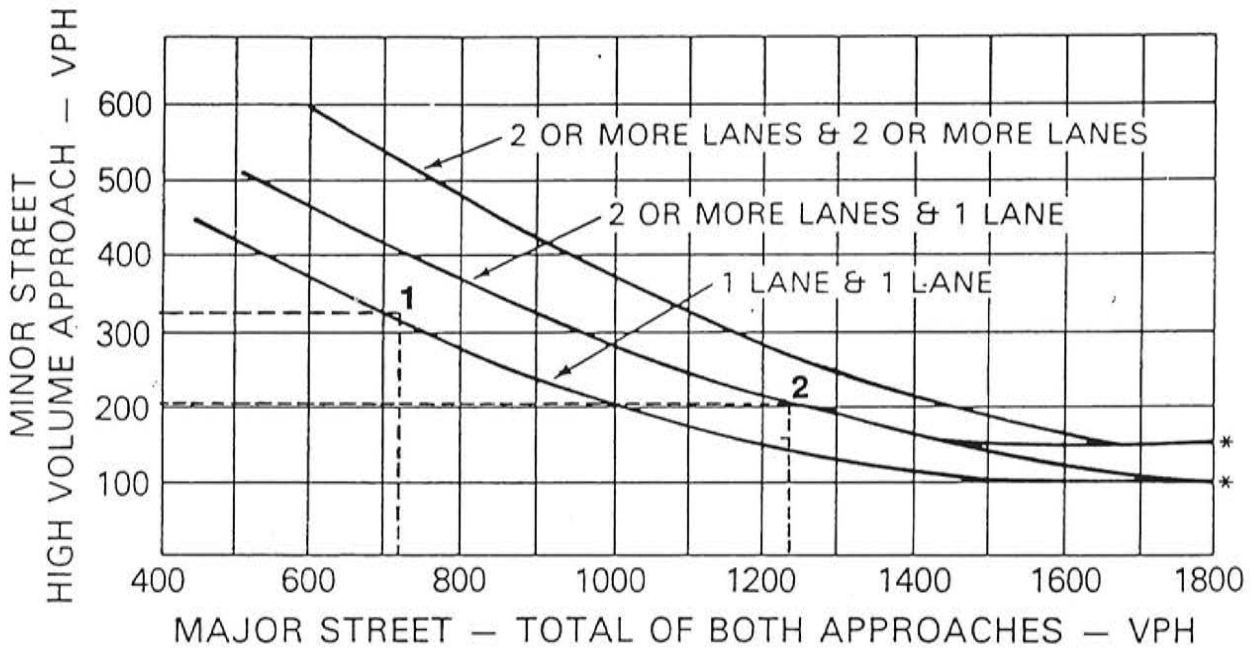
A signal warrant analysis based on *Manual on Uniform Traffic Control Devices* (MUTCD) methodology was conducted for US Highway 2 intersections at Fifth Avenue Northeast and Fifth Avenue Northwest. The analysis was performed for an average weekday P.M. peak hour using 2010 projections. The standard graphical technique for evaluating the peak hour volume warrant from the MUTCD was utilized. Figure 27 shows the 2010 projected P.M. peak hour traffic volumes used in the peak hour volume warrant analysis.

The signal warrant analysis has concluded that the US Highway 2/Fifth Avenue Northwest intersection will meet the peak hour volume warrant by year 2010. Fifth Avenue Northeast projections do not meet the peak hour warrant for a two-lane major street approach. It may, however, meet the eight-hour or other warrants. This intersection should be monitored periodically to verify that MUTCD warrants are not satisfied. At such time that MUTCD signal warrants are met, signals should be installed. Figure 30 shows the peak-hour volume warrant criteria and the plotted points representing the two intersections.

Overall Corridor

The overall US Highway 2 corridor should be reconstructed to a four-lane divided urban type section as indicated on Figure 10. These sections will include an improved median area for crossings as well as a wider strip of property between mainline US 2 and the frontage roads. This widened strip will allow for landscaping and bicycle paths as described above. The estimated overall cost for the recommended improvements is \$7,300,000.

PEAK HOUR VOLUME WARRANT



*NOTE: 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

¹ 5TH AVENUE NORTHEAST

² 5TH AVENUE NORTHWEST

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US 2 CORRIDOR STUDY



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M.U.T.C.D. PEAK HOUR
VOLUME WARRANT

Figure 30

IMPROVEMENT SCHEDULE

The improvements described above should be constructed according to an overall plan. The prioritization should be based upon an assessment of need and the overall implementation requirements. It is not acceptable to adopt a plan that would reconstruct the entirety of US Highway 2 in a single construction year. This would present a tremendous burden on the local business community as well as the overall convenience for residents of East Grand Forks. It should, therefore, be decided that the recommended corridor improvements be completed in two segments. The first segment would be that west of TH 220. This segment should be first because of the relatively poor condition of the pavement and the fact that there is an immediate safety concern for pedestrians at Fifth Avenue Northwest. Improvement of this intersection early would also provide direction and incentive to economic development of the "BN Triangle" area.

Construction of this segment should be done such that traffic is maintained on the corridor at all times. There really are no suitable detours for US Highway 2 traffic that are convenient. Recent plans to close DeMers Avenue between Third Street Northwest and Second Street Northwest would make traffic circulation in the area even more circuitous. Looking at the traffic volumes, it should be possible to construct the improvements west of TH 220 half of the roadway at a time. When mainline TH 220 is being reconstructed, Fifth Avenue Northwest should also be modified. This way, traffic in the area is disrupted only once, and construction can take place in the most convenient way possible.

The second phase of the project should include the area east of TH 220. This would require complete reconstruction of the roadway from its existing rural four-lane divided section to the urban four-lane divided section. Again, the improvements should be able to be made along one side at a time allowing traffic to be maintained on the other side. By doing so, traffic patterns in the area should be disrupted to the least amount possible. When the main corridor is being reconstructed, connections at Third Avenue Northeast and 15th Avenue Northeast should be made. Improvements to the existing intersections at 11th Avenue Northeast and Fifth Avenue Northeast should also be done at the same time. Each phase of this project may require two years to complete. Therefore, a four-year overall construction period should be planned.

The estimated cost for phase one of the project is \$2,489,000. Phase two will cost an estimated \$4,809,000 for a total project cost of \$7,298,000.

CONCLUSIONS

The US Highway 2 corridor in East Grand Forks, Minnesota, provides an interesting combination of issues and opportunities that were addressed as part of the study. The issues ranged from circulation and potential safety problems at the intersection of Fifth Avenue Northwest to economic development concerns at Third Avenue Northeast. The study followed two primary courses in order to identify alternatives and then recommend a preferred alternative. These courses involved both objective and subjective analysis. A traditional approach was conducted that examined safety and congestion levels and also projected traffic for all of the studied alternatives. On top of this, and perhaps most importantly, an aggressive public participation program was conducted to solicit the views of community leaders and the general citizenry as to an understanding of the issues, development of alternatives, and finally the selection of a final alternatives. To the greatest extent possible, a balance was struck between the objective and subjective criteria in order to determine the most implementable solutions.

The highlight of the study was the determination of a preferred alternative for the intersection of Fifth Avenue Northwest. It was decided that this intersection should be reconstructed to provide direct north and south access to US Highway 2. In addition, access at Third Avenue Northeast and 15th Avenue Northeast was also recommended. Overall, the corridor is identified as requiring a change from its existing cross-section to an urban type four-lane divided section.

Improvements in street lighting, landscaping, bike paths, and signalization were all recommended as part of the overall improvement plan. Finally, an improvement schedule was developed that prioritized improvements east and west of TH 220.

The corridor study is a first step toward the actual construction of improvements. Though an important step, it is still necessary to obtain funding for preliminary and final design and overall construction. It will be up to the citizens of East Grand Forks to obtain concurrence from the Minnesota Department of Transportation that this project is critical to the basic transportation needs of the community and that funding should be set aside to see the improvements actually constructed.

It could be argued that there are other projects that are more critically needed due to safety or congestion problems. Considering the benefits, however, to economic viability and the potential safety benefits to the intersection of Fifth Avenue Northwest, it is difficult to imagine a project that is more sorely needed by a community.

The next step to proceeding with these projects is to enter into the preliminary design stage. This stage will allow for development of more exact geometric data and right-of-way needs. This information will yield a much more reliable estimate of construction costs, which can be used in the budgeting process. Hopefully, this study has paved the way toward these more refined steps and has answered the question "What should be done along US Highway 2?" If the recommended improvements are pursued, US Highway 2 will continue to enhance the image of East Grand Forks.

ST. HILLAIRE GRAIN ELEVATOR TRAFFIC IMPACT STUDY

Introduction

As part of the US Highway 2 corridor study, the MPO has requested that an analysis be made of the proposed St. Hillaire Grain Elevator, which will be located just to the east of the intersection of 15th Avenue Northeast and 10th Street Northeast. The location of the site is illustrated on Figure 30. The site is bounded on the south side by 10th Street Northeast, on the west by 15th Avenue Northeast, and north and east by US Highway 2.

The proposed elevator will generate a significant amount of traffic throughout the year. Seven to eight million bushels of grain are expected to be processed annually. On its busiest day, between 150,000 and 200,000 bushels of grain will be processed. This equates to a peak truck loading of approximately 250 trucks per day. Approximately 90 percent of the product will leave the area by rail and 10 percent by semi-tractor trailer. This combination of vehicular and rail modes must be carefully considered in determining the overall impact this development will have on the surrounding street system.

This study is being conducted within the context of the US Highway 2 corridor study. This is being done to ensure continuity of the recommendations for the site transportation needs and the overall corridor. Those transportation improvements needed to accommodate the grain elevator should be incorporated into the overall plan for improvements of US Highway 2.

The study is conducted using a traditional approach of first examining the trips generated by the site, assigning those trips to the existing street system, conducting a capacity and circulation analysis, and then making recommendations of improvements to accommodate traffic.

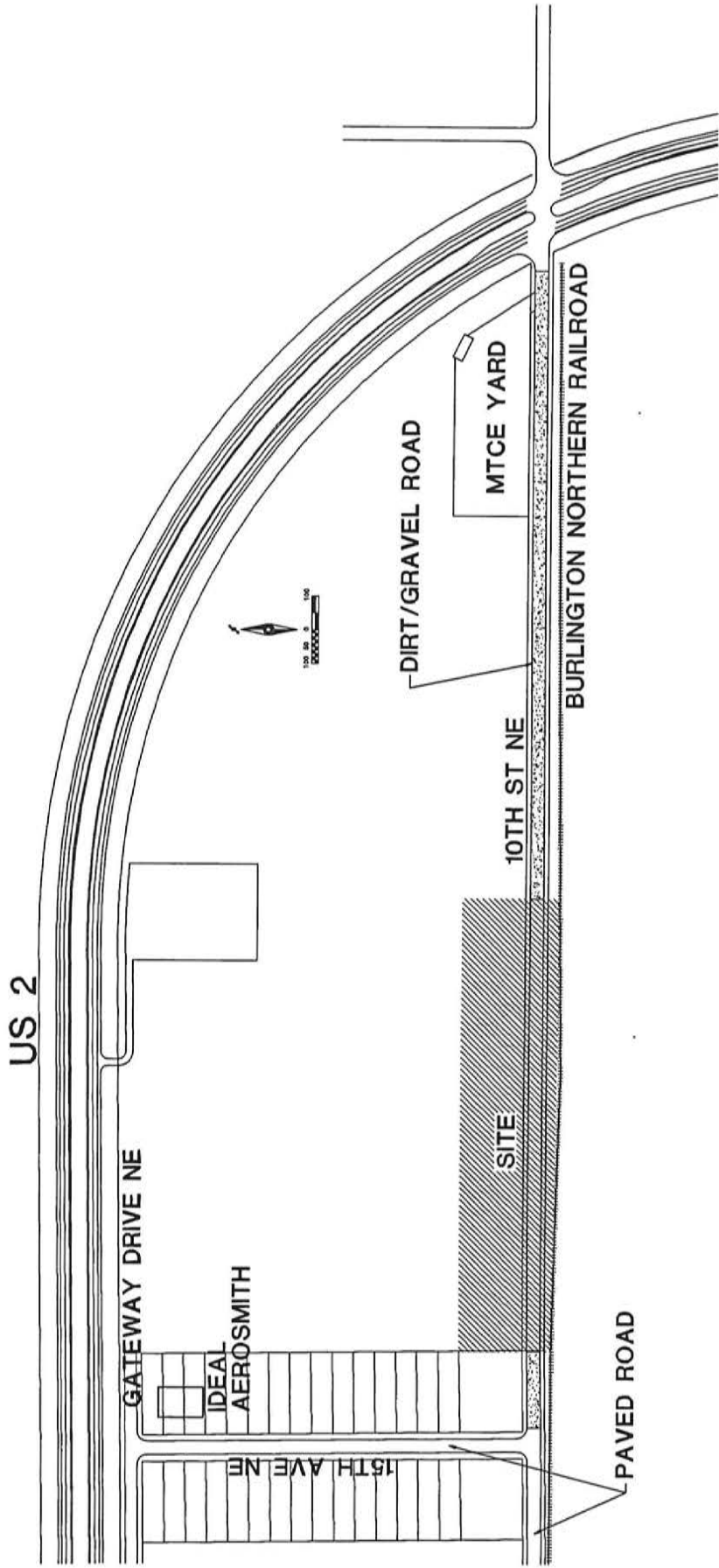
Existing Street System

As indicated on Figure 31, the existing street system surrounding the site is a combination of paved and unpaved roadways. Tenth Street Northeast dead ends just east of 15th Avenue Northeast. Right-of-way for 10th Street, however, extends from 15th Avenue Northeast easterly to an intersection with US Highway 2. This right-of-way is traveled somewhat but is presently a combination of gravel and dirt. Travel during inclement weather would be very difficult for all but four-wheel drive vehicles. Fifteenth Avenue north of the site does not connect to US Highway 2. Instead, it intersects with the frontage road just south of US Highway 2. The frontage road carries traffic from 15th Avenue Northeast west to 11th Avenue Northeast where there is an intersection with US Highway 2.

On the south side of the site is the existing Burlington Northern railroad tracks. At one time, this was the mainline for the Burlington Northern. This, however, has been shifted away from this area and this trackage is used primarily to serve the industrial uses farther west of the site. These tracks are suitable for serving the proposed grain elevator, however.

Proposed Site Plan

The proposed site plan consists of a proposed 345,000 bushel elevator, a dumping area for delivery trucks, an office, and two large future storage areas. To accommodate the elevator traffic and provide access to the Burlington Northern track, 10th Street



EAST GRAND FORKS • US 2 CORRIDOR STUDY
ST. HILLAIRE SITE EXISTING CONDITIONS

Northeast is being shifted from its existing alignment approximately 150 feet north. An illustration of the proposed site plan is shown on Figure 32. It should be noted that as part of the relocation of 10th Street, it is planned that this street will be constructed to a 40-foot width and would be connected with US Highway 2 to the east. This will provide direct access to US Highway 2 from 10th Street Northeast. Making this connection will serve to accommodate traffic destined to or coming from the east. Traffic to and from the north and west, however, would use 11th Avenue Northeast and the frontage road of US Highway 2.

Traffic Forecasts

As described earlier, the grain elevator is expected to handle 150,000 to 200,000 bushels of grain per day. Typically, there are two types of trucks used to deliver the grain to the elevator. One is a 600-bushel straight truck and the other an 850- to 950-bushel triple-axle truck. It is expected that the combination of these two types of vehicles will result in overall activity of 250 entering and 250 exiting trucks per day.

The delivery times for the grain elevator are expected to occur between 6:00 A.M. and midnight during busy fall periods. The majority of the traffic, however, arrives between 1:00 and 10:00 P.M. Traffic during this time period is relatively steady.

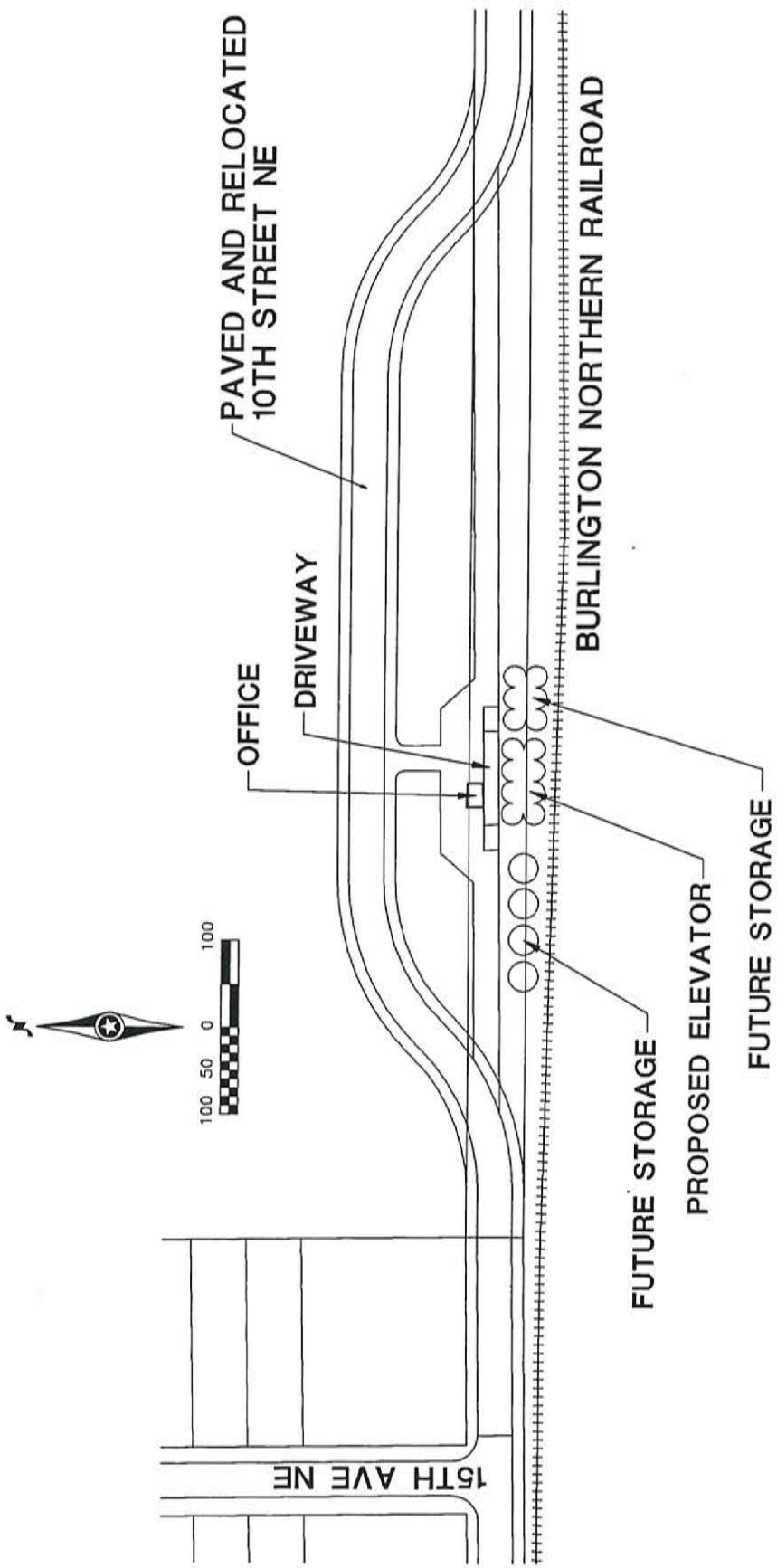
For a typical analysis, it is necessary to determine a worst case scenario. This generally occurs during the evening rush hour period, which is between the hours of 4:30 and 5:30 P.M. To estimate the amount of truck traffic occurring during this period, it is necessary to divide the 250 entering and exiting trucks by a factor of 10 (hours between 1:00 P.M. and 10:00 P.M.). To further provide for a worst case scenario, this figure should be multiplied by a factor of two to simulate peak conditions within the peak hour. Therefore, for further analysis, it will be assumed that this elevator will generate 50 incoming and 50 outgoing truck trips during the evening peak hour. Added to this will be 10 entering and 10 exiting employee trips during the same period.

Traffic will be distributed similar to that occurring at grain elevators presently. The operator of the existing grain elevator at the intersection of Central and 10th Avenue Northeast indicates that these trucks arrive equally from the east and the north. Grain trucks coming from the west are more likely to stop at elevators in North Dakota or will not use US Highway 2 for their trip. Using this information, traffic was projected to have an even distribution north and east. Figure 33 is an illustration of the distribution and number of site-generated traffic.

The site-generated traffic was then added to the background traffic determined in the other portions of the corridor study. Year 2010 traffic projections were used in the development of these projections. The total traffic, therefore, expected to use the surrounding street system under the proposed configuration is shown on Figure 34. These figures were used in the performance of the capacity analysis.

Traffic Analysis

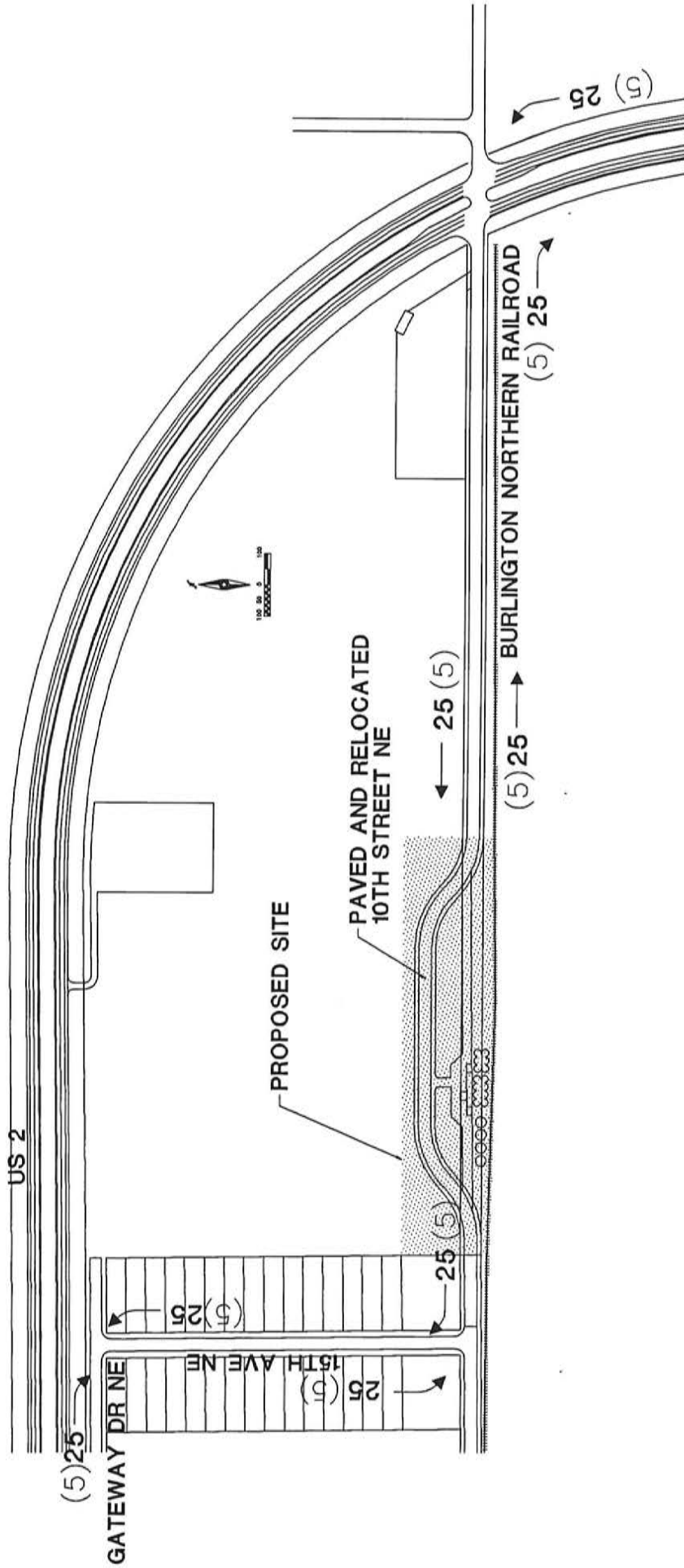
A capacity analysis was conducted at the intersection of US 2 and 10th Street Northeast and at the intersection of 11th Avenue Northeast and US 2. The analysis was conducted with and without the proposed truck traffic generated by the grain elevator. The results are shown in Table 6.



EAST GRAND FORKS • US 2 CORRIDOR STUDY

ST. HILLAIRE SITE

PROPOSED SITE PLAN



EAST GRAND FORKS • US 2 CORRIDOR STUDY

P.M. PEAK SITE GENERATED TRAFFIC VOLUMES ST. HILLAIRE SITE

LEGEND

- 25 TRUCK TRAFFIC
- (5) PASSENGER VEHICLES

TABLE 6 ST. HILLAIRE POST DEVELOPMENT LEVEL OF SERVICE SUMMARY				
Intersection	Critical Movements			
	NBL	NBT	SBL	SBT
11th Avenue NE/US 2	D	B	C	C
10th Street NE/US 2	B	A	C	A

Please note that these intersections are expected to operate at a Level of Service C or better and no undue congestion is expected. Special care needs to be taken with respect to overall circulation and the conveniences with which these trucks access US Highway 2. Looking first at the intersection of 11th Avenue Northeast and US Highway 2, the frontage road connection at 11th Avenue Northeast is much too close to US 2 to allow for smooth traffic turning movements for trucks to and from the highway. In order to access the roadway, a series of 90-degree turns must be conducted. These turns will require semis to veer out outside their actual lanes and into oncoming traffic. Under the low traffic conditions expected, this does not create a serious problem, however, as the industrial area develops, the street system will become more congested and these awkward movements more of a problem.

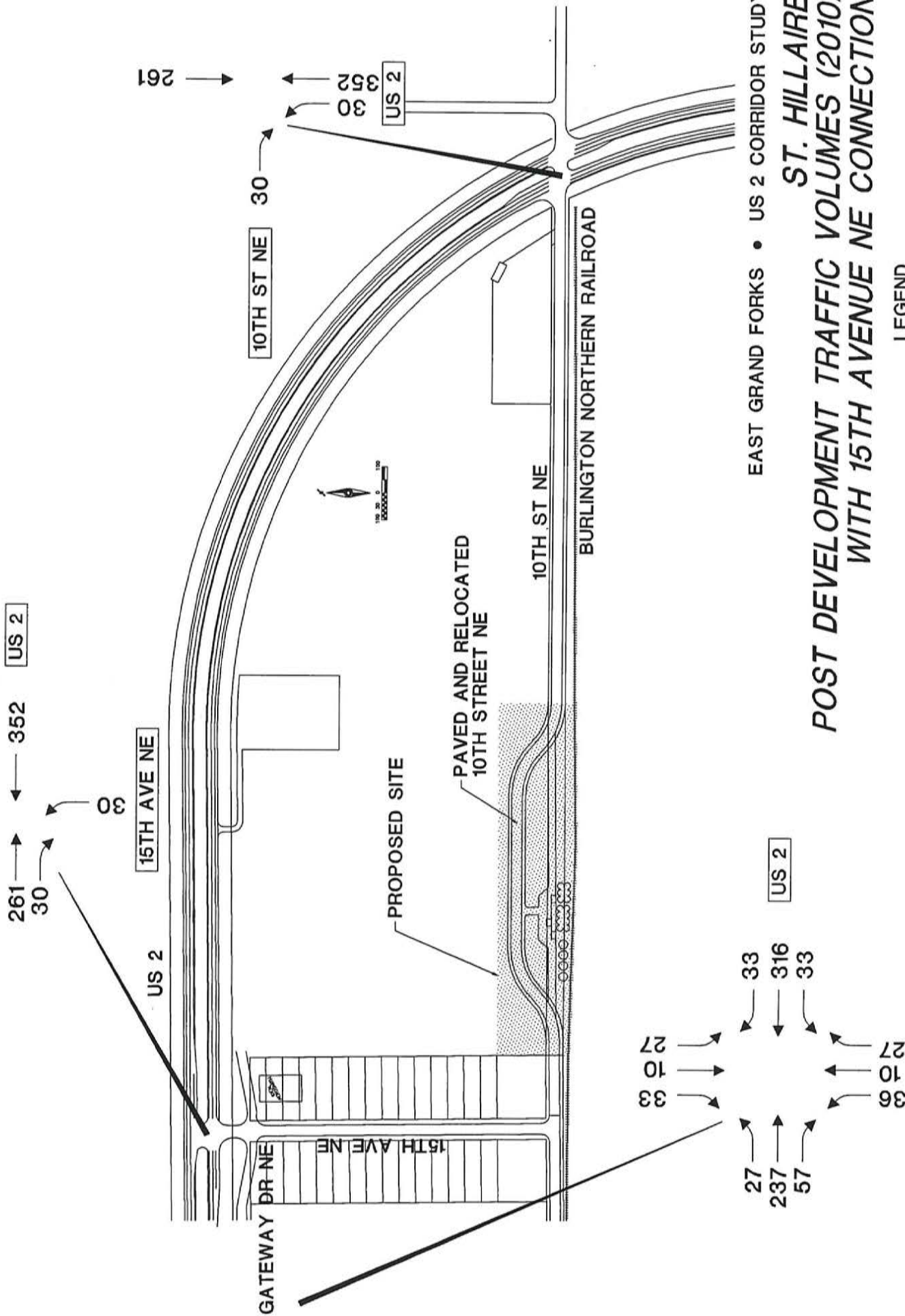
There are two ways to address this problem. The first is to simply direct truck traffic to use 10th Street Northeast over to 11th Avenue Northeast, then proceed from the intersection of 10th Street and 11th Avenue north to US Highway 2. All streets are paved, and this should allow straightforward access with a minimum of turning. Improvements would likely be necessary at the intersection of 11th Avenue Northeast and 10th Street Northeast, however. Improvements would likely require the curb return radius at the intersection to be 50 feet. The problem with this solution is that it would bring heavy truck traffic adjacent to the existing Comfort Inn, which is in the southeast corner of the intersection of 11th Avenue Northeast and US Highway 2. Problems with noise, congestion, dirt, and safety are legitimate concerns. The heavy truck traffic destined to and from the grain elevator should be routed away from the motel as much as possible. For this reason, another alternative should be examined.

The intersection of 15th Avenue Northeast currently does not connect to US Highway 2 directly. If it did, truck traffic to and from the grain elevator could access the site without making excessive 90-degree turns to avoid the Comfort Inn Motel. Spacing between 11th Avenue and 15th Avenue should be sufficient to allow this level of access without creating a situation where the two intersections interfere with one another. The benefits of providing direct access to this heavy truck used area would outweigh the capacity loss caused by the additional access point. Projected volumes for the 15th Avenue Northeast are shown on Figure 35.

This improvement is recommended in the US Highway 2 corridor study and should be done immediately in conjunction with the construction of the proposed grain elevator.

Rail Transportation

As mentioned in the introduction, this site will be serviced by the Burlington Northern Railroad. Ninety percent of the product from the elevator will leave the site by way of



EAST GRAND FORKS • US 2 CORRIDOR STUDY
ST. HILLAIRE
POST DEVELOPMENT TRAFFIC VOLUMES (2010)
WITH 15TH AVENUE NE CONNECTION

LEGEND

999 - PM PEAK HOUR

rail car. It is expected that the site will be serviced by a unit train consisting of 110 car units. One entire unit train will be used per week. These units will likely be broken down into 25-car subunits that will be filled each day. The cars will be stored west of the site. As cars are needed, they will be brought into the area and filled.

The rather large demand for rail car usage will result in some disruption of traffic on the local street system. At the present time, there are only two streets within the study area that have continuity across the Burlington Northern tracks. These are TH 220 and Fifth Avenue Northeast. TH 220 is kept open as much as possible. The intersection of Fifth Avenue Northeast, however, will be blocked periodically as cars are reorganized to service the existing elevator at Central Avenue and the proposed elevator at 15th Avenue Northeast. It is expected that the Fifth Avenue Northeast crossing will be blocked for approximately one-half hour between 1:00 and 2:00 P.M. twice per week. The crossing will not be blocked during peak traffic periods for the surrounding street system.

If indeed this is the only blockage that occurs, the impact to the surrounding street system will be minimal. The level of traffic between 1:00 and 2:00 P.M. on Fifth Avenue Northeast is very minimal and Central Avenue can easily pick up the additional traffic that may occur as a result. Since the redirection of traffic during the crossing closing period is so minor, no further calculations of capacity during these periods were conducted. It is clear that there may be some inconvenience to Fifth Avenue Northeast traffic, but not unreasonable.

Conclusions

This study has resulted in the following conclusions:

- The proposed grain elevator is expected to handle seven to eight million bushels of grain annually.
- On its busiest days, between 150,000 and 200,000 bushels of grain will be processed.
- Grain will be brought to the elevator by way of 600-bushel and 850- to 950-bushel trucks, resulting in over 250 truck deliveries per day.
- During the peak traffic hour of the surrounding street system (4:30 to 5:30 P.M.), it is estimated that there will be 50 entering truck trips and 50 exiting truck trips.
- Trips to and from the site will be distributed evenly to the east and to the north.
- The proposed traffic generated by the elevator can be accommodated by the surrounding street system assuming the improvement of 10th Street Northeast between 15th Avenue Northeast and US 2 is completed.
- A direct connection of 15th Avenue Northeast to US Highway 2 should be constructed to separate heavy elevator truck traffic from other area traffic such as that generated by the Comfort Inn at 11th Avenue Northeast. Curb returns at the intersections of 10th Street Northeast and 11th Avenue Northeast, and 10th Street Northeast and 15th Avenue Northeast should be reviewed to ensure compatibility with large truck traffic.

- The railroad access to the site should not create an undue hardship to other local streets in the area. The only affected intersection will be Fifth Avenue Northeast, which is expected to be blocked only for a period of one-half hour twice a week between the hours of 1:00 and 2:00 P.M. weekdays. Other railroad crossings such as TH 220 can be used to handle diverted traffic.