



Bismarck-Mandan Regional North South Beltway Corridor Study

Prepared for



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1412 Basin Avenue
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June, 2009
UEI No. 307.155

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Regional North-South Beltway Corridor Study

Bismarck-Mandan, North Dakota

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- M-1 Beltway and Interchange Justification Information
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Regional North-South Beltway Corridor Study

Bismarck-Lincoln-Burleigh County Regional Corridor Element

I. Introduction

Development of a beltway for the Bismarck-Mandan area is not a new idea. The original planned beltway was considered in the early 1990's and extended only on the Bismarck side of the Missouri River. The beltway was planned along Century Avenue, Bismarck Expressway, Washington Street, Main Avenue, Schafer Street and Tyler Parkway. The improvements that have been completed along Tyler Parkway and Century Avenue were an implementation of that plan.

The original beltway concept, though not fully implemented, served a valuable purpose. It enabled the City of Bismarck to prioritize improvements to key corridors, which resulted in long-term traffic movement and development benefits.

In time and as the community continued to grow, it became apparent that another beltway should be planned to provide connectivity for the entire community and to serve the next tier of development. The implementation of another beltway was again proposed in the 2001 Long Range Transportation Plan (LRTP). That Plan called for a beltway that included the Northern Bridge Corridor, extensions along 71st Avenue, 66th Street, 48th Avenue South, and a Southern Bridge Corridor on the Burleigh County side of the Missouri River. On the Morton County side of the Missouri River, the planned beltway extended from the Southern Bridge Corridor, north along 24th Avenue, and east on 37th Street to connect back into the Northern Bridge Corridor.

Following adoption of the 2001 LRTP, the 2005 LRTP and the Northern Bridge Corridor Study were completed and continued to promote development of a new beltway.

The Bismarck-Mandan Metropolitan Planning Organization (MPO) initiated the Regional North-South Beltway Corridor Study on August 22, 2007. This study, completed June 1, 2009, had the following objectives:

- To determine whether there is justification for the north-south beltway corridors, and if so, to document it.
- To select the short and long range optimum alignments for the north-south beltway corridors (This selection would be based on corridor-level analysis and would be subject to future environmental considerations).
- To identify potential impacts and associated mitigation strategies.
- To facilitate stakeholder and decision maker involvement.
- To secure jurisdictional acceptance of preferred alternatives and implementation strategies.

A. Beltway Definition

This Study defines a beltway corridor as a regional roadway designed for high mobility and safety that is intended to carry commuter and truck traffic in and around Bismarck-Mandan's urban fringe. High mobility and safety on beltway corridors are promoted through right of way preservation, access management and elements of safety design. The beltway corridor is proposed to operate at a speed of 55 mph, except where development or other factors preclude safe operation at that speed.

It is important to recognize that the intent of the beltway, as proposed by this Study, is not to develop a facility similar to I-494/I-694 in Minneapolis, Minnesota metropolitan area. Conditions locally prohibit that type of facility from being established.

The term, beltway, is more an indicator of regional roadway continuity and provides a strong basis for the optimum locations for new Interstate interchanges east of Bismarck and west of Mandan. Where planned, the beltway will someday become a high priority corridor in terms of maintenance, early snow removal and funding for improvements.

B. Study Area

The Study Area for the Regional North-South Beltway Corridor Study is shown in Figure 1. The 2005 LRTP provided a starting point of possible locations for the north-south beltway corridors. Further input from the Steering Committee and the general public was received by the end of 2007 to determine the limits of the study.

C. Draft Purpose and Need

The purpose and need for the beltway, or segments of the beltway, will be fully established by future environmental documents undertaken in project development efforts. For this Study, the purposes of the beltway are:

- To relieve traffic on busy, parallel routes such as US Highway 83 and Centennial Road.
- To provide commuters and freight haulers with a high safety and mobility alternative to existing routes.
- To provide linkage between area development and other community or regional destinations.
- To provide regional roadway system continuity. Barriers to roadway system continuity include the Missouri River, Interstate 94 and the railroads. These barriers interfere with roadway system continuity when there are insufficient crossings to address the needs of traffic to efficiently get to their destination.

The need for the beltway was viewed from the standpoints of corridor preservation and the physical development of the beltway facility. Preservation of the beltway is needed because of the general benefits, traffic/roadway benefits, development benefits and landowner benefits including:

General Benefits of Corridor Preservation

- Facilitates better decision making
- Enables jurisdiction to secure most appropriate location
- Helps jurisdictions prioritize needs and plan services
- Reduces the cost of future improvements

Traffic/Roadway Benefits of Corridor Preservation

- Promotes optimal transportation infrastructure spacing
- Enables jurisdictions to manage access, thereby securing a safer roadway facility for the future
- Secures adequate space for future facilities

Development Benefits of Corridor Preservation

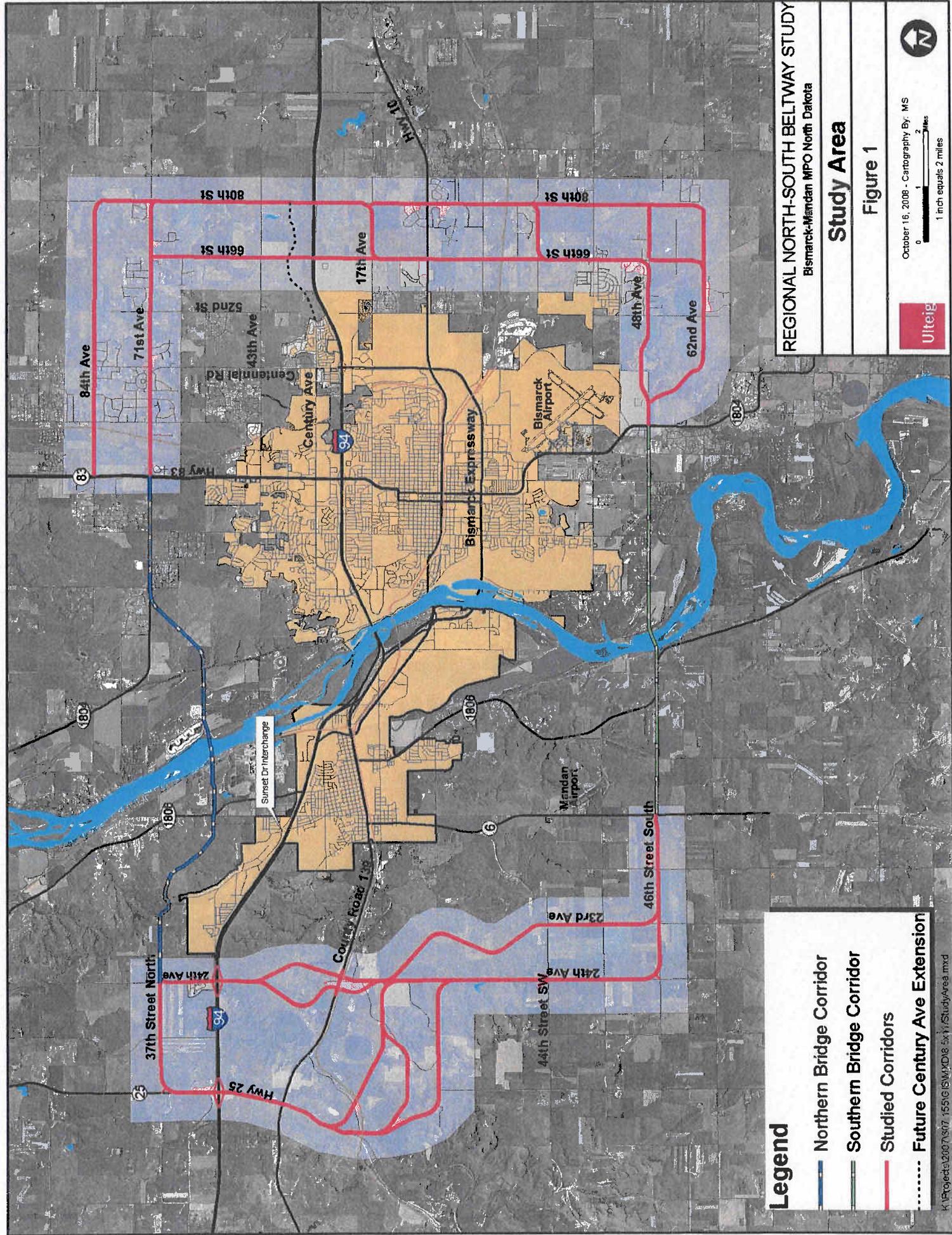
- Facilitates future area growth
- Protects against adverse development
- Improved access and mobility can increase land value and reduce the cost of travel

Landowner Benefits of Corridor Preservation

- Prepares landowners for the future
- Increases opportunities to mitigate impacts

The existing need for physical improvements along the proposed beltway at this time is mostly limited to addition of turn lanes and shoulder improvements along 71st Avenue North. However, Bismarck is growing and eventually additional transportation system improvements will be needed to support this growth. The projected need for improvements includes:

- Capacity and/or safety improvements along corridor segments
- Access or intersection improvements to address ongoing development
Interstate access



Legend

- Northern Bridge Corridor
- Southern Bridge Corridor
- Studied Corridors
- - - - - Future Century Ave Extension

REGIONAL NORTH-SOUTH BELTWAY STUDY
 Bismarck-Mandan MPO North Dakota

Study Area

Figure 1

October 16, 2006 - Cartography By: MS
 0 1 2 Miles
 1 inch equals 2 miles



K:\Project\2007\3107_1551G\ISW\XDRLE 5x11\StudyArea.mxd

II. Existing Corridor Conditions

Six corridors on the east side of the Missouri River were analyzed by this Study. They are 71st Avenue North, 84th Avenue North, 66th Street, 80th Street, 48th Avenue South and 62nd Avenue South. This section of the Report presents data and information collected relative to these corridors.

A. 71st Avenue North

The 71st Avenue North corridor was originally proposed in the 2001 LRTP as the north beltway. Much of this corridor already exists as an important east-west roadway and part of it is designated as ND Highway 1804.

Between US Highway 83 and 80th Street, 71st Avenue North exists as a rural, two lane highway with no turn lanes. It also has narrow shoulders or no shoulders along its length. Along platted segments of the road, right of way has been acquired to 75 feet from road centerline. Unplatted segments have only 33 feet right of way from road centerline.

A significant number of direct property accesses (approximately 40 locations) exist along the 71st Avenue corridor. The development has been strictly residential and the remainder of the corridor is planned for residential development.

The existing ground profile (grades) for 71st Avenue North consists of generally rolling terrain along the entire length of the corridor. The profile (grades) for this alternative is shown in Figure P1 of Appendix B-3.

West of US Highway 83, planning for the completion of a Northern Bridge Corridor has been completed. That planning maintained a strong connection to the 71st Avenue North corridor as the northern beltway.

B. 84th Avenue North

The corridor exists today from 19th Street to about ½ mile east of Centennial Road. 84th Avenue North exists as a rural, two lane gravel surfaced roadway with no turn lanes. It also typically has narrow shoulders or no shoulders along its length. The roadway is non-existent throughout the remainder of the corridor.

Starting from about midway between US Highway 83 and Centennial Road and heading east, right of way has been platted and acquired to 75 feet from road centerline. Unplatted segments have only 33 feet right of way from road centerline.

Direct property access (approximately 19 locations) exists along the 84th Avenue corridor. The development has been strictly residential and the remainder of the corridor is planned for residential development.

The existing ground profile (grades) for this corridor consists of generally rolling terrain, with steep grades existing for a short distance east of 66th Street. The profile (grades) for this alternative is shown in Figure P2 of Appendix B-3.

C. 66th Street

The 66th Street corridor was originally proposed by the 2001 LRTP as the east beltway. Much of this corridor already exists as a rural, two lane highway with no turn lanes. Gaps in the corridor exist from I-94 to the south for approximately one mile, and from 43rd Avenue North to 1 ¼ miles north. It typically has narrow shoulders or no shoulders along its length. 66th Street currently operates as the most active north-south roadway east of Bismarck Expressway.

Much of the corridor still has only 66 feet of right of way, though in some platted areas the County has acquired 75 to 100 feet of right of way from road centerline.

Direct property access (approximately 48 locations) exists along the 66th Street corridor. To date, the development has been strictly vacant and residential use. Most of the land use along 66th Street and north of the Interstate is planned for commercial land use or open space. South of I-94, the projected land use transitions from industrial to mixed commercial/residential to residential uses.

The existing ground profile (grades) for this corridor consists of generally rolling terrain, with few locations where steep grades exist. The profile (grades) for this alternative is shown in Figures P3 and P4 of Appendix B-3.

D. 80th Street

The 80th Street corridor was originally chosen by the Technical Advisory Committee as a potential north-south beltway location alternative that should be considered by this Study. It was presented during the first set of public input meetings as an alternative receiving equal consideration to other alternatives under study.

The 80th Street corridor exists as a two lane, rural roadway without turn lanes. Most of the corridor has a gravel surface and 66 feet of right of way. Segments that have not been constructed include portions south of County Highway 10 and north of 71st Avenue. Industrial land use is proposed along 80th Street for the first two miles north of I-94 and the first mile south of I-94. Further north and south along the corridor, residential land use is proposed.

The existing ground profile (grades) for this corridor consists of generally rolling terrain, with steep grades existing for short distances in a few locations. The profile (grades) for this alternative is shown in Figures P5 and P6 of Appendix B-3.

E. 48th Avenue South

The 48th Avenue South corridor was originally proposed in the 2001 LRTP as the south beltway. It was seen by local staff as a logical choice because it was a section line corridor and locations further south had greater issues with vertical grade.

West of 52nd Street, the 48th Avenue South corridor currently does not exist. Extension of the existing corridor west to ND Highway 1804 would require crossing one waterway and approximately 200 linear feet of wetlands and 4,575 linear feet of floodplain. There are 11 access points west of 66th Street.

Existing land use along 48th Avenue South is strictly residential. Residential land use is proposed in undeveloped tracts along the corridor with the exception of the south side in the vicinity of 66th Street, where commercial and mixed commercial/residential land use has been planned.

The existing ground profile (grades) for this corridor is relatively flat, with moderately steep grades existing for short distances. The profile (grades) for this alternative is shown in Figure P7 of Appendix B-3.

F. 62nd Avenue South

The 62nd Avenue South corridor exists as a two lane, rural roadway from approximately 1 mile west of 66th Street and extending east. It currently has 66 feet of right of way.

Most of the corridor remains undeveloped, though some residential tracts have been developed. Rural residential land use is planned along the remainder of the corridor.

The existing ground profile (grades) for this corridor consists of generally rolling terrain, with very steep grades existing east of Apple Creek and east of 66th Street. The profile (grades) for this alternative is shown in Figures P8 and P9 of Appendix B-3.

G. Existing Railroads

A north – south rail line exists and crosses at-grade with the 71st Avenue and 84th Avenue corridors approximately ¾ miles east of US Highway 83. This rail line is owned and operated by Dakota Missouri Valley & Western (DMVW) Railway.

An east-west rail line exists and crosses 66th Street approximately 1 ½ miles south of County Highway 10. The 80th Street corridor terminates just north of crossing the railroad tracks. This rail line is owned and operated by Burlington Northern Sante Fe Railway Company.

Planning for the beltway assumes that all future railroad crossings will eventually be converted into grade-separated crossings.

III. Existing and Projected Traffic Analysis

Typically corridor studies develop existing and projected traffic volumes in order to determine the level of service for the corridor. The level of service represents a letter grade (A-F) of the performance of major intersections along the corridor, and for the corridor as a whole.

For this corridor study, no existing traffic operational issues were identified that merited that level of analysis. Rather, the existing and projected traffic volumes were estimated in order to determine the scale of roadway improvements that should be planned to address traffic needs through the year 2030.

The primary questions that the traffic analysis needed to answer include:

- What level of traffic congestion can be expected on parallel arterial routes and can the beltway have a positive impact on relieving congestion on those routes?
- Will the facility require 1 or 2 through traffic lanes per direction by the year 2030?
- What are the turn lane needs anticipated along the beltway?
- What types of interchanges should be considered at the locations where interchanges are planned?
- What speeds should be planned along the beltway?

A. Beltway and Parallel Route Traffic

US Highway 83, Centennial Road and Bismarck Expressway are important arterial roadways that carry the majority of north-south traffic on Bismarck's east side. As Bismarck has continued to grow, their ability to handle expected traffic increases has been in question.

The 71st Avenue and Centennial Road corridors currently serve as beltway-type facilities on Bismarck's northeast side. Car and truck traffic activity on these corridors demonstrate the need for long range transportation infrastructure connectivity between I-94 and US Highway 83.

Existing and projected traffic along these corridors were reviewed to determine whether adequate roadway capacity is available to serve the community in the future. This analysis included a review of potential beltway corridor capacity and the ability of the beltway to relieve traffic on these corridors.

Existing Average Daily Traffic (ADT) volumes for the Study Area were available from the 2006 Traffic Volume Map. Based on a review of that map, ADT volumes in the vicinity of I-94 along corridors in the Study Area are:

Year 2006 Average Daily Traffic (Vehicles Per Day)

- US Highway 83 – 40,000*
- Centennial Road – 16,000
- 71st Avenue North – 4,000
- 66th Street – 2,300

* March 2007 Traffic Count – north side of Capitol Avenue

The MPO's Travel Demand Model was used to estimate projected ADT volumes for the year 2030. Based on a review of the model and assuming no significant beltway improvements are made, average daily traffic volumes in the vicinity of I-94 along corridors in the Study Area are estimated at:

Year 2030 Average Daily Traffic (Vehicles Per Day)

- US Highway 83 – 60,000
- Centennial Road – 46,000
- 71st Avenue North – 4,000
- 66th Street – 2,300

Based on the projected levels of traffic, the existing US Highway 83 and Centennial Road corridors will experience significant traffic congestion by the year 2030 unless additional north-south corridor traffic capacity is added. Improvements to existing corridors will be made, but those improvements alone cannot address projected traffic needs.

The beltway corridor is believed to be the only viable solution to add needed transportation system traffic capacity. The closer the beltway is constructed to the urban area, the greater the ability the beltway will have to relieve traffic on these parallel routes. A comparison of projected traffic volumes associated with beltway and interchange improvements is provided in Appendix B-1.

B. Beltway Traffic Lane Needs

Both 3-lane and 5-lane typical sections were considered to address future traffic needs along the beltway corridor. Based on the traffic analysis, a 3-lane typical section should meet the traffic needs for the majority of the corridor through the year 2030.

Corridor preservation for a 5-lane typical section is recommended because at some point in the future, additional traffic is expected to exceed the capacity of a 3-lane typical section. Preservation of adequate right of way for the 5-lane typical section assures that the long range traffic needs along the corridor can be addressed without unnecessary future right of way acquisitions and related impacts.

C. Turn Lane Needs

Turn lanes provide benefits both from a traffic capacity standpoint and from a traffic safety standpoint. This Study proposes that left turn lanes be provided for all access locations, if possible. Right of way for double left turn lanes should be preserved at potential high traffic generators, including all section line corridors. Minimum requirements for turn lane storage and design tapers are based on design speed and are established by state and federal guidelines.

Access points that are close to major intersections should be eliminated or relocated further from the intersection if possible. These access points can present significant safety concerns in the future if not addressed. A ¼ mile spacing for access is the current City and County standard. Beltway alternative exhibits provide recommendations to address these conditions.

D. Interchange Types

Various interchange types were considered for each location an interchange was proposed. Existing development may be avoided in a given quadrant of an interchange by replacing the interchange ramp with a loop in another quadrant.

Given that major traffic movements occur to and from the urban area, replacement of interchange ramps with loops was found undesirable. Therefore, only diamond interchange configurations were recommended.

E. Beltway Speed

Based on definitions found in the 2000 Highway Capacity Manual, the beltway has characteristics that indicate it would be classified as a Class I or Class II urban street. These characteristics include low to medium development; low driveway access density; separated left turn lanes; and important to very important mobility function.

Free flow speeds for a Class I urban street range from 45-55 mph, whereas free flow speeds for a Class II urban street range from 35-45 mph. Wherever feasible, a design speed of 55 mph was used for beltway alternatives. Exceptions are noted in the corridor exhibits. The primary street characteristic that indicates where lower speeds should be applied is driveway access density.

Posted speed limits are typically set based on corridor design, field studies of traffic speed or on perceived or actual safety concerns. As traffic increases, speeds will generally drop. This is especially the case in areas where driveway density is higher and in neighborhood settings.

Under today's conditions, existing segments of all studied beltway alternative corridors operate as rural highways with speeds typically posted at 55 mph. No changes in existing speed are recommended. Future adjustments in speed along segments of the beltway should be undertaken based on speed study and safety analysis. Future posted speeds along the corridor should range from 35 mph to 55 mph as conditions warrant.

IV. Issues Identification and Analysis

This section provides a listing of the issues identified from technical analysis and from the public process.

A. Beltway and Interchange Location

This issue pertains to selection of the optimal location for the beltway and an interchange along I-94. This issue is addressed in the alternative identification and evaluation sections of the Report.

B. Corridor access

Access along the beltway corridor was addressed on an individual, case by case basis. The intent of the analysis was to consider ways to minimize the impacts of access on corridor safety and mobility. Methods used to minimize access impacts included:

- Eliminating or combining access locations
- Relocating access to more favorable locations
- Moving access from the beltway onto an adjacent roadway
- Aligning access with other access locations
- Increasing the spacing between access points
- Use of frontage or backage roads
- Planning access for currently undeveloped areas

Regardless of the selected corridor for the beltway, pre-existing access conditions must be adequately accounted for. In many cases, there is no solution other than maintaining access as it exists today. Alternatives minimizing access impacts on the beltway while maintaining adequate property access have been incorporated into the Report exhibits.

The cumulative impacts of poorly managed access along an arterial corridor greatly affect the safety and mobility of a corridor. Often, these impacts are added one access concession at a time. Given the high safety and mobility standards desired for the beltway, access management should be strongly considered in future upgrades that allow enhancement of existing access conditions and preservation to limit access in the future.

C. Typical Section and Right of Way

The typical section and right of way needed for the beltway are issues because they can impact adjacent properties and the future ability to develop corridor improvements. Alternatives for these design elements are included in Section V.B of the Report.

D. Corridor Design and Posted Speed

The corridor design and posted speed for the beltway are issues because they also impact the speed of drivers and the impacts of construction. Where a high level of access will be maintained along the corridor, higher speeds are detrimental to corridor safety. Alternatives for these design elements are included in Section V.B of the Report.

E. Pedestrian/bicycle safety

As traffic volumes increase and roadway improvements are made, pedestrian and bicycle safety are important issues to address. Development of sidewalk facilities that accommodate both pedestrians and bicycles is recommended along the beltway corridor. The sidewalk facility should be at least 5 feet from the pavement edge to provide adequate separation between users and vehicles. The proposed typical section includes the sidewalk facility set back adjacent to the right of way line.

Intersections along the beltway should be adequately signed and marked in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). Since in many locations, there will not be stop signs controlling beltway traffic, additional grade separated facilities may need to be planned in areas of heavy pedestrian or bicycle activity.

F. Truck Traffic

Truck traffic can be a major source of traffic noise. It also needs to be accounted for when determining the optimal design features of a corridor. This Study recommends that future corridor improvements accommodate Interstate semi-trucks up to a 65 foot standard wheel base (WB-65) size wherever applicable.

G. Utility Impacts

The primary utility impacted along the beltway corridor is the communications tower located in the vicinity of the proposed I-94/66th Street interchange. Information concerning this impact is included in Appendix 6. Other utilities located or proposed along the beltway will be addressed in detail during the development stages of future projects.

H. Social Issues

Many technical and non-technical issues can have social implications. Social issues can include land use impacts, neighborhood impacts, increased traffic, traffic noise, truck activity, environmental and visual impacts. Social issues are most pronounced in locations of existing residential development. Based on input received from the public, many people who live along the proposed beltway corridor see the beltway as a threat to their neighborhood, their lifestyle and their environment.

Given the complex and varied nature of the social issues that were raised, a concise analysis and response to these issues cannot be found in a single location within this Report. Rather, the analysis and response is provided throughout the text of this Report and some of the more common and specific social issues that were raised are addressed in Section VII within the common questions and responses narrative.

I. Surrounding Future Land Use

Public input suggested that the proposed beltway corridors should not be considered because there was too much residential development and that the beltway should be fronted by only commercial property. The Bismarck-Mandan Regional Future Land Use Plan provides guidance on the types of land use that is anticipated along either side of the beltway corridor. The Plan indicates that much of the undeveloped land adjacent to the beltway is recommended for commercial development.

In locations where residential areas transition to commercial areas, buffers are proposed to enable the transitions to occur.

J. Environmental Issues

Environmental issues include potential impacts to air quality, noise and vibration, water quality, threatened and endangered species, wetlands, floodways or floodplains, cultural resources, environmental justice, and others. (Environmental justice is the analysis of human health, economic and social effects on minority and low income populations). A detailed investigation into these potential impacts was beyond the scope of this Study and would be included as part of future project development.

A limited analysis was completed regarding some of these environmental issues. Discussion of the completed analysis and findings follow:

a) Cultural Resources

A Class I Cultural Resource Inventory was completed in February 2008 by Beaver Creek Archaeology, Inc. (See Appendix 9). This Inventory provides knowledge of the cultural resources and the potential of cultural resources within the project area. Results of this effort are summarized as follows:

- The proposed project area is located in a region that has a high potential for archaeological sites based upon the number of known sites in the study area. Therefore, a Class II Reconnaissance Inventory or Class III Intensive Cultural Resource Inventory should be performed prior to implementation of any improvements.

- No known archaeological, historic or architectural sites were located within the immediate vicinity of the proposed corridors. Sites that were identified are over ½ mile distant.

b) Noise Analysis

Based on a review of projected traffic volumes and speeds, noise levels along the corridor will not exceed Federal Noise Guidelines for residential property. While noise levels will increase as traffic increases, a noise ordinance can be implemented to regulate use of Jake Brakes on trucks. The City of Bismarck currently has an engine brake use ordinance and appropriate signing in place at various roadway locations.

c) Floodway or Floodplain

Impacts that roadway improvement projects have on the floodway or floodplain need to be identified and either avoided or mitigated. While analysis of avoidance or mitigation was beyond the scope of this study, the areas of impact were preliminarily identified and used for alternative comparison purposes.

K. Issue Avoidance or Mitigation

Two alternatives were considered to respond to the social and environmental issues that exist: relocate the beltway corridor or mitigate the issues.

Relocation of the beltway corridor further from Bismarck has been considered since the onset of the Study. Beyond relocation to 84th Avenue North, 80th Street or 62nd Avenue South, other corridors were determined to be ineffective in addressing the purpose and need for the beltway corridor. The 84th Avenue North, 80th Street and 62nd Avenue South corridors were not preferred based on the comparison of technical findings.

Many of the social issues that have been raised (increased traffic, noise, truck activity) are components of continued new development. Demand for beltway improvements will likely follow development activity. Many of the anticipated social issues will result from the new growth and development, not from the presence of an improved roadway facility.

Mitigation of some social issues can be addressed through corridor and boulevard design. Trees and landscaping can be built within the boulevard to provide visual shielding.

Acquisition of right of way in developed areas can be delayed until traffic conditions warrant more than a 3 lane roadway section. This delay may be 20 years or longer in many locations.

V. Alternatives Development and Evaluation

The alternatives development and evaluation process followed a series of four steps. This section of the Report provides a list and explanation of the first three steps. It also provides a description and comparison of studied alternatives.

Alternatives Development and Evaluation Process

- A. Identify Beltway Route Location Alternatives
- B. Establish Beltway Design Criteria
- C. Refine and Compare Corridor Alignments
- D. Alternatives Selection and Recommendations

A. Identify Beltway Route Location Alternatives

This Study was to identify which alternatives were reasonable to consider as viable beltway alternatives. The draft purpose and need statement listed in the first section of the Report was used as the basis for this determination. The following criteria and methods were used to identify beltway route location alternatives.

- Locations that had been proposed by the LRTP were used as a starting point.
- Location of the beltway needed to be close enough to the urban area to effectively relieve traffic from congested portions of US Highway 83 and Centennial Road.
- Location of the beltway should be able to align with a future I-94 interchange. Likewise, a future I-94 interchange should be planned where the future beltway is located.
- Location of the beltway should align with or have reasonable connectivity with future north and south extensions to the Missouri River, with potential for crossing the Missouri River.
- A brainstorming session was held with the Steering Committee to identify potential routes that had merit.
- The general public was asked whether other route alignment alternatives should be considered beyond those that were originally presented at the first public input meeting.

Having considered the issues and input received, the following alternatives were identified:

1. North Beltway Alternatives (See Figure 1)

Alternatives for a beltway corridor on the north side of Bismarck included 71st Avenue North and 84th Avenue North. Locations further north, though discussed, were eliminated early in the study process because they did not address the project purpose and need, and they did not provide reasonable connectivity with the proposed Northern Bridge corridor.

a) 71st Avenue/US Highway 83 Intersection Considerations

It is very likely that this intersection will continue to operate well into the future as a standard, signalized intersection with turn lanes. Two hundred feet of right of way will eventually be needed to construct an east-west, five lane section with right and double left-turn lanes.

This corridor study has identified the right of way that would be needed to accommodate an interchange at the 71st Avenue/US Hwy 83 intersection (See Figure B11 in Appendix B-2).

Unless adequate right of way for interchange ramps is secured, further development could limit the feasibility to construct an interchange in the future. Therefore, although the need for an interchange at this location has not been substantiated, preservation of adequate right of way is recommended.

NDDOT has commented that an interchange at this location is not consistent with the other types of traffic control common along the US Highway 83 corridor. In-state experience has indicated that a mix of interchanges and signalized intersections can result in traffic operational and safety issues. Further analysis would be needed prior to NDDOT supporting construction of an interchange at this location.

b) 71st Avenue/66th Street Intersection Considerations

Five general concepts were prepared to address the connection between 71st Avenue and 66th Street (See Figures B12 and B17-B20 in Appendix B-2.) Comments pertaining to the advantages and disadvantages of these concepts are included in section VIII of this Report.

2. East Beltway Alternatives (See Figure 1)

Alternatives for a beltway corridor on the east side of Bismarck included 66th Street and 80th Street. Locations further east, though discussed, were eliminated early in the study process because they didn't address the project purpose and need.

a) Interchange Considerations

This corridor study has identified the right of way that would be needed to accommodate an interchange at the intersection of I-94 and 66th Street. Although a variety of interchange configurations are feasible at this location, a diamond interchange ramp configuration is most conducive to handling the turning movements that are projected (See Figures B13, B13A and B14 in Appendix B-2). This configuration assumes that loops may need to be added at some point in the future.

Interchange placement alternatives included centering the interchange on the 66th Street section line, or centering the interchange either East or West of the 66th Street section line.

Analysis indicated placement of the interchange on the 66th Street section line was the most desirable alternative. While it would impact the communications tower and North-side properties, this alignment was most conducive to providing good sight distances, traffic safety and ideal layout for future development.

Location of the interchange to the West was found to have both property impacts and substantial impacts on the Bismarck landfill. Substantial earth fill would also be required on the North side of the interstate.

Impacts related to placing the interchange farther east were found to include property impacts similar to other possible alignments, as well as reductions in desirable roadway geometrics.

3. South Beltway Alternatives (See Figure 1)

Alternatives for a beltway corridor on the south side of Bismarck included 48th Avenue South and 62nd Avenue South. Locations further south, though discussed, were eliminated early in the study process because of the extreme grade line and difficulty in making a connection to ND Highway 1804 that those options presented. Further, it was believed that even if a corridor further south were constructed, drivers would prefer the better terrain and route directness available once 48th Avenue or 62nd Avenue were built.

B. Establish Beltway Design Criteria

Once the full range of alternatives had been identified, design criteria critical to the safety and mobility of the beltway were established based on City/County Ordinances, NDDOT and Federal design guidelines. These design criteria are shown in the following table.

DESIGN FEATURE	BELTWAY CORRIDOR	ARTERIAL CORRIDOR
Design Speed	55-65 mph (Preferred)	40-45 mph (Preferred)
	35-45 mph (Minimum)	35 mph (Minimum)
Expected Posted Speed	55 mph & Varies	45 mph
Projected Level of Service	C or Better	C or Better
Clear Zone (ft)	46 (65 mph)	28 (45 mph)
	28 (45 mph)	10 (35 mph)
Maximum Grade	4% (65 mph)	6% (45 mph)
	6% (45 mph)	7% (35 mph)
Minimum Stopping Sight Distance (ft)	645 (65 mph)	360 (45 mph)
	360 (45 mph)	305 (35 mph)
Minimum Passing Sight Distance (ft)	2285 (65 mph)	1625 (45 mph)
	1625 (45 mph)	1280 (35 mph)
Access Spacing (ft)	1320 (Recommended)	1320 (Recommended)
ROW (ft)	200 ft (Preferred)	200 (Preferred)
Lane Width (ft)	12	12
Shoulder Width (ft)	8	6 - 8
Preferred Shoulder Type	paved	paved
Turn Lane Width (ft)	12	12
Turn Lane Length (ft)	560 (65 mph)	varies (45 mph)
	varies (45 mph)	varies (35 mph)
Inslope (H:V)	6:1	6:1 (45 mph)
Normal Ditch (depth x width) (ft)	4 x 24	4 x 24 (45 mph)
Backslope (H:V)	3:1	3:1 (45 mph)
Minimum Bridge Width (New) (ft)	40	40
Approach & Ditch Block Slopes (H:V)	10:1	10:1 (45 mph)
Interchange @ I-94	Yes	Possible Overpass

A discussion of some of the more important design parameters follows:

1. Design Speed and Access Management

In order for the beltway to effectively serve commuter traffic, higher design speeds are beneficial. Yet, in areas where more access is allowed, safety can be compromised.

It is important for access to be managed to enable traffic to operate more safely and at higher speeds. Where significant access already exists, the posted speed of the beltway corridor should be lowered to allow traffic to enter and exit the corridor more safely.

2. Projected Level of Service

The level of service represents a letter grade (A-F) of the performance of major intersections along the corridor, and for the corridor as a whole. At a Level of Service C, most people feel that delays are at an acceptable level. Further, Level of Service C or better is strongly encouraged for federally funded projects.

3. Clear Zone

The clear zone refers to the unobstructed, relatively flat area provided beyond the edge of the traveled way for the recovery of errant vehicles. It is measured from the edge of the through lane into the ditch. Federal guidance provides the widths that are acceptable and they are based on speed, vehicle volume and embankment slope.

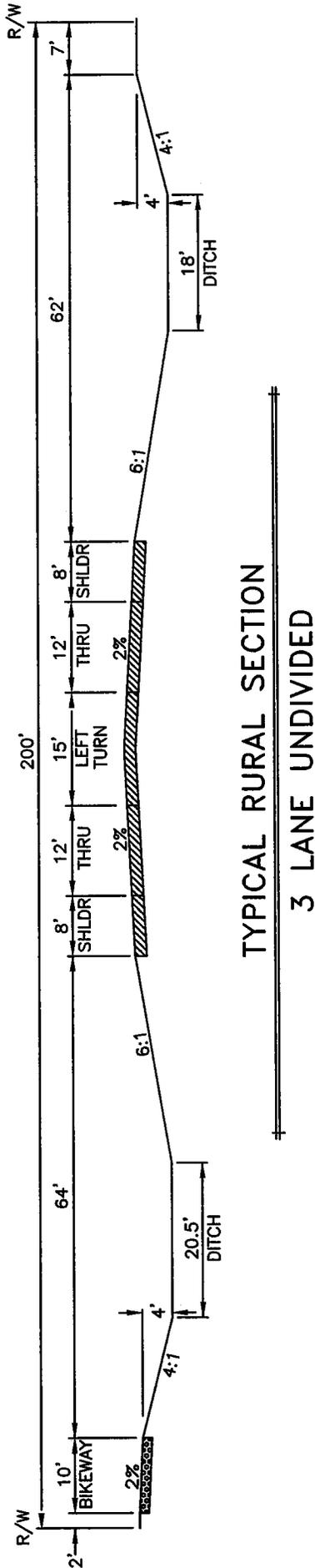
4. Right of Way and Typical Section

Adequate right of way along the beltway is needed to enable construction of the ultimate typical roadway section that may be required in the future. Typically, this equates to the level of traffic projected at least 20 years into the future.

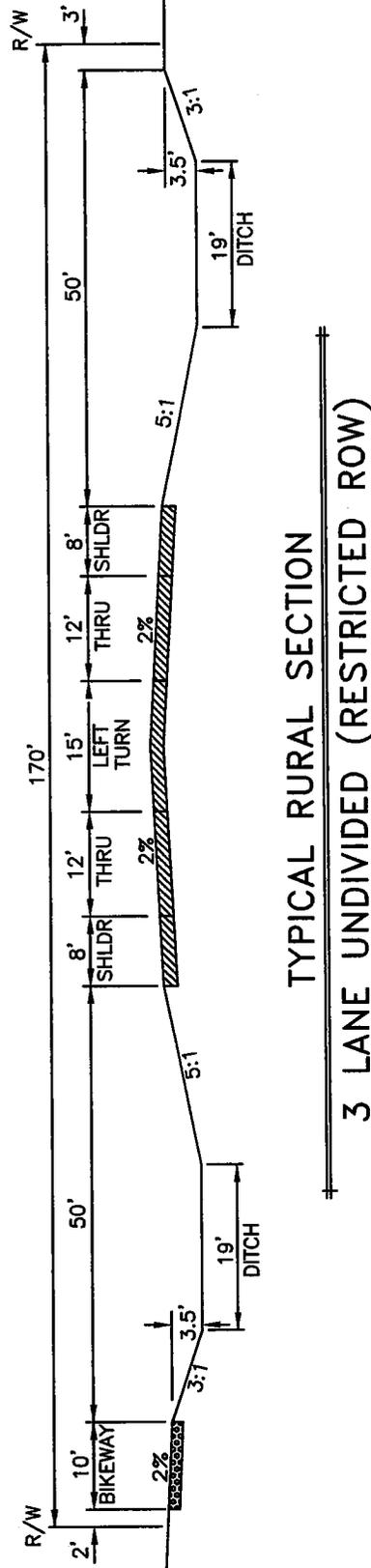
Based on the traffic analysis, a single through lane in each direction plus turn lanes should address the projected traffic along most segments of the corridor over the next 20 year period (See Figure 2).

This study proposes adequate right of way be preserved to enable construction of a 5-lane, rural typical roadway section (See Figure 3). This has many benefits:

- Early preservation of right of way reduces potential for expensive acquisition in the future.
- Increases construction set-backs, thus improving visibility along the corridor
- Provides adequate space for utilities, pedestrian/bicycle facilities, and landscape treatments

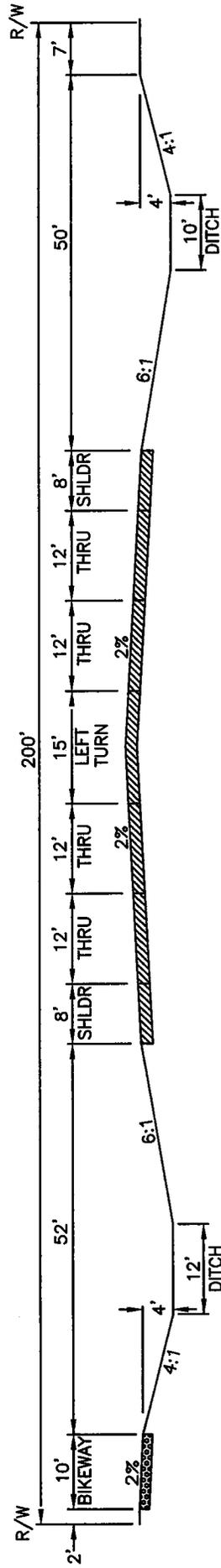


TYPICAL RURAL SECTION
3 LANE UNDIVIDED

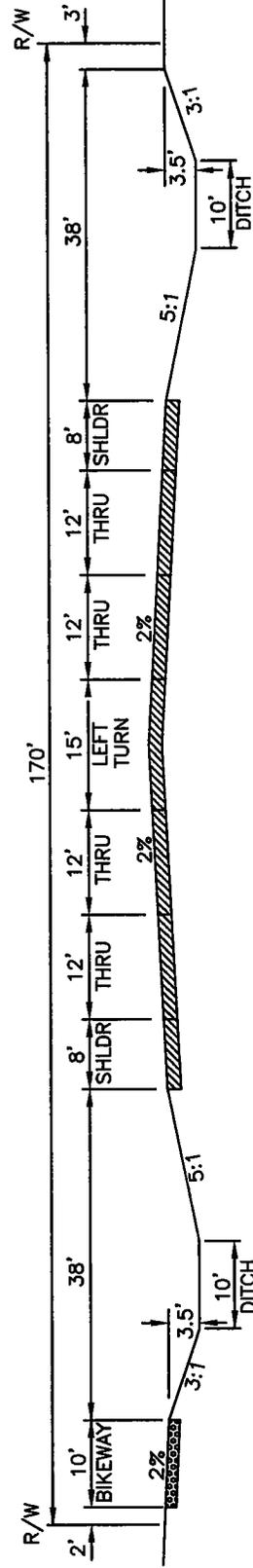


TYPICAL RURAL SECTION
3 LANE UNDIVIDED (RESTRICTED ROW)

REGIONAL NORTH-SOUTH BELTWAY STUDY Bismarck-Mandan MPO North Dakota
3-Lane Rural Section - Undivided
Figure 2
Ulteig



TYPICAL RURAL SECTION
5 LANE UNDIVIDED



TYPICAL RURAL SECTION
5 LANE UNDIVIDED (RESTRICTED ROW)

REGIONAL NORTH-SOUTH BELTWAY STUDY
Bismarck-Mandan MPO North Dakota

5-Lane Rural Section - Undivided

Ulteig

C. Refine and Compare Corridor Alignments

As the study progressed, detailed analysis was conducted and adjustments to the alignments were made. Alternatives for the north, east and south alignments of the beltway were identified. These alternatives are described and compared in the following paragraphs:

1. 71st Avenue North

West of US Highway 83, 71st Avenue provides the best continuity to the remainder of the planned northern boundary for the beltway. Even if a Northern Bridge across the Missouri is never constructed, Highway 1804 will continue to be a prominent corridor with access to destinations west and north of the Study Area.

Within the Study Area, 71st Avenue has existing conditions that are drawbacks from a beltway development standpoint. These include: limited right of way availability in some areas, presence of nearby residential development, and multiple private access locations.

The 71st Avenue/Centennial Road Corridor Study examined right of way conditions along the segment of 71st Avenue between US Highway 83 and Centennial Road. That report recommended acquiring right of way to a minimum of 170 feet wide along developed segments of the corridor. That recommendation would meet the minimum requirements for right of way contained in this Report.

The ability to reduce the level of access along 71st Avenue is limited without use of a center raised median. Local staff has stated concerns of implementing additional raised medians due to added maintenance requirements. Potential access modifications are proposed by this study with the intention to reduce access and improve safety. These access modifications are shown in Appendix B-2.

A grade separated railroad crossing would be needed at the Dakota Missouri Valley & Western railroad intersection. A preliminary profile (grades) for the grade separated railroad crossing is found in Figure 4.

2. 84th Avenue North

The 84th Avenue North corridor was suggested as a possible north-side alternative at the November 2007 public input meeting. Residents who access onto 71st Avenue felt that this corridor was a better alternative than 71st Avenue because:

- 84th Avenue had fewer access points

- 84th Avenue had more potential for additional right of way due to less development and typically greater building setbacks
- Construction of the beltway along 84th Avenue would allow more infill development

A detailed technical examination of the 84th Avenue corridor was conducted following the November 2007 public input meeting. Numerous comparisons between 84th Avenue and 71st Avenue were made and presented to the Steering Committee. The Steering Committee selected 71st Avenue for further detailed review because:

- The 84th Avenue corridor did not align with the remainder of the planned beltway west of US Highway 83. Further, an extension of 84th Avenue west of US Highway 83 to tie into the Northern Bridge Corridor was not reasonably feasible due to the presence of existing development and terrain barriers.
- The 84th Avenue corridor had similar drawbacks to those occurring along 71st Avenue, including presence of direct access, limited right of way in some locations, and presence of nearby residential development.
- It was anticipated that even if 84th Avenue were chosen as the preferred beltway location, many users would still use 71st Avenue as the beltway because of the direct connection to ND Highway 1804.

3. 66th Street

Many of the conditions present with the 66th Street corridor measure favorably against the purpose and need for the beltway corridor including:

- Of the corridors studied, 66th Street has the greatest potential to alleviate existing and projected traffic congestion from existing parallel routes (US Highway 83 and Centennial Road).
- 66th Street matches the ideal interchange spacing of 2 miles separation between interchanges. Further, the potential for interchange justification at 66th Street is higher than other routes given its proximity to the urban area. Therefore, it is likely that a 66th Street/I-94 interchange could be built sooner than for alternatives further east.
- 66th Street provides direct access to regional development activity, including the City of Lincoln.

Within the Study Area, 66th Street has existing conditions that are drawbacks from a beltway development standpoint. These include: limited right of way availability in some areas, presence of nearby residential development, and multiple private access locations.

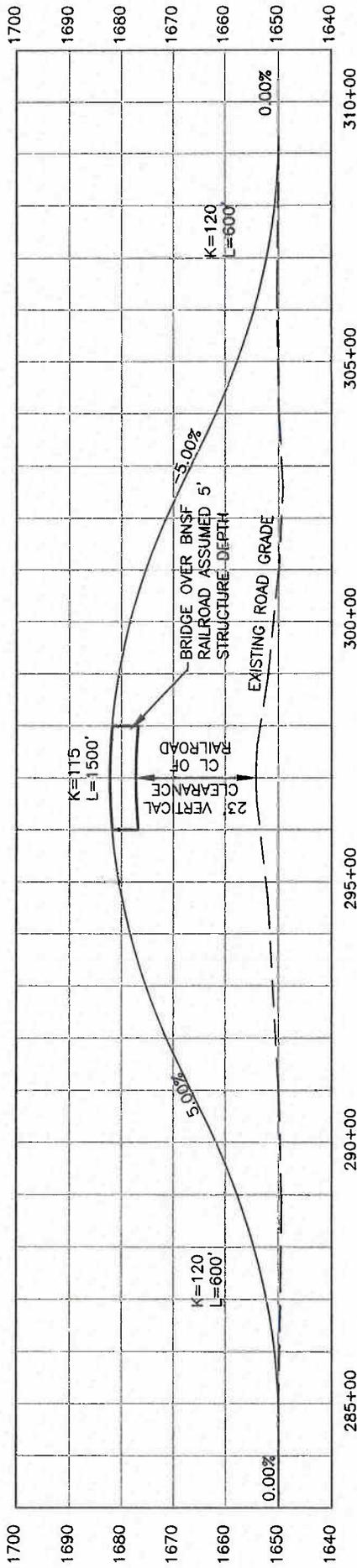
A grade separated railroad crossing would be needed at the Burlington Northern Sante Fe railroad intersection. A preliminary profile (grades) for the grade separated railroad crossing is found in Figure 5.

4. 80th Street

The 80th Street corridor was originally chosen by the Technical Advisory Committee as a potential north-south beltway location alternative that should be considered by this Study. It was presented during the first set of public input meetings as an alternative receiving equal consideration to other alternatives under study.

The 80th Street corridor, unlike 66th Street, has an existing overpass across I-94. While this overpass is beneficial for short and intermediate range development access, it does not meet future requirements for an interstate interchange.

Following the first public input meeting, more detailed analysis was conducted. The analysis concluded that in all technical areas of comparison, 80th Street compared unfavorably with 66th Street as a potential location for the beltway.



ASSUMPTIONS:

1. 200 FOOT TOTAL BRIDGE LENGTH
2. 5% GRADE
3. 55 MPH DESIGN SPEED



5. 48th Avenue South

According to current airport master plans, expansion of the Bismarck Municipal Airport will someday eliminate the southerly Airway Avenue connection to Lincoln Road. When this occurs, the 48th Avenue South corridor could become the only east-west route available to connect developments south of Lincoln with destinations south of Bismarck and along ND Highway 1804.

Within the Study Area, 48th Avenue has existing conditions that are drawbacks from a beltway development standpoint. These include: limited right of way availability in some areas, presence of nearby residential development, and multiple private access locations.

The 48th Avenue alignment analysis indicates that the beltway can operate effectively within the existing platted 150 foot right of way for many years without need for further right of way acquisition. And while nearby residents raise legitimate concerns over the impacts of a beltway at this location, a beltway would provide them with a mobile corridor with safety design elements on which to drive. Additionally, local officials could effectively manage allowance of additional access in order to maintain the operational integrity of the corridor.

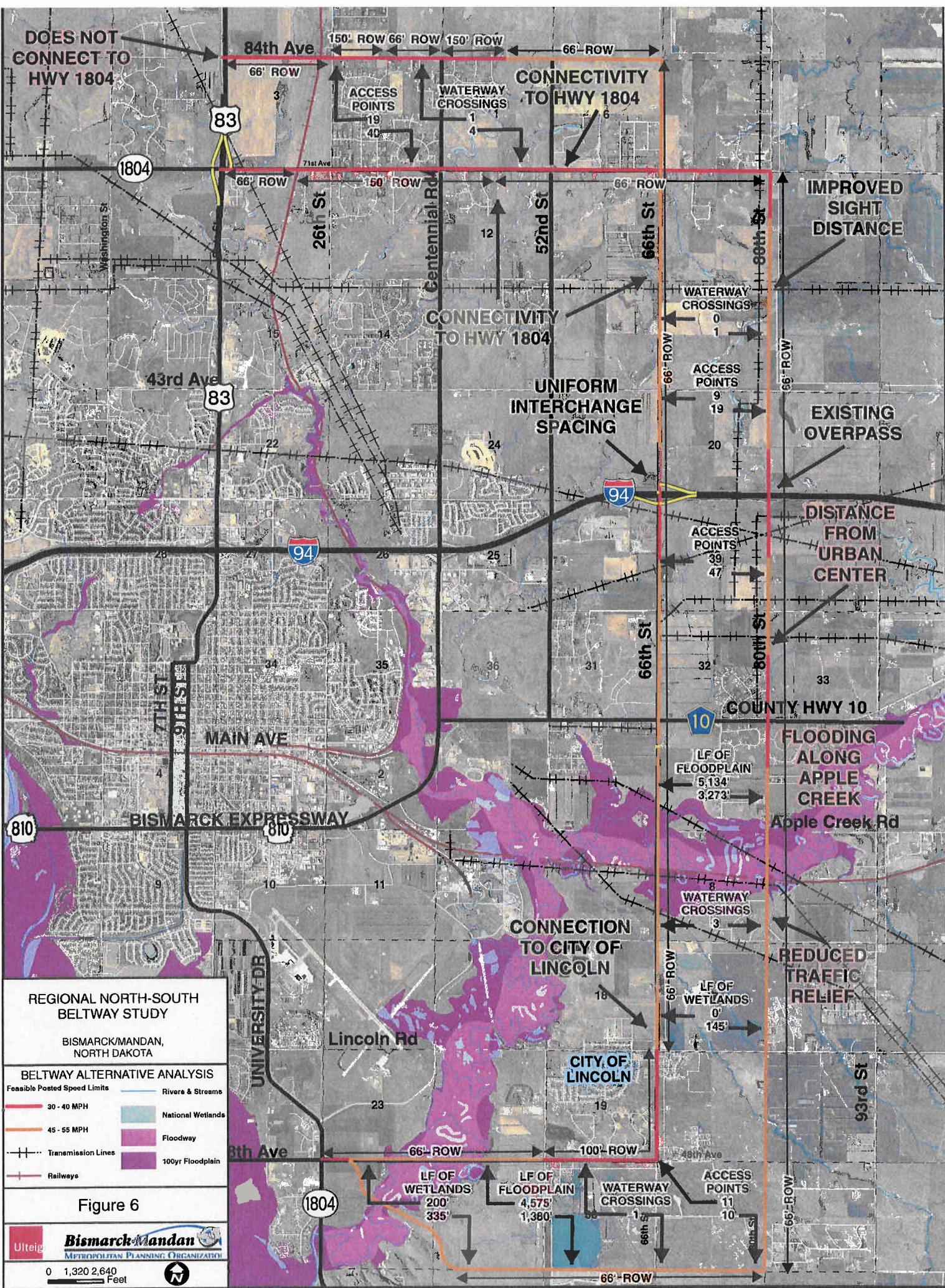
The 48th Avenue corridor also benefits from a curvilinear connection with 66th Street that was established during platting. This connection was provided with the beltway plan in mind.

6. 62nd Avenue South

The 62nd Avenue corridor compared favorably with the 48th Avenue corridor in categories of flooding and length of floodplain crossed. However, it was found to have a fatal flaw due to the extreme ground profile (grades) found on the center and east end of the corridor.

D. Beltway Route Comparison Map and Matrix

The following map (Figure 6) provides a comparison of the quantifiable criteria used to evaluate and compare beltway route alternatives:



DOES NOT
CONNECT TO
HWY 1804

150' ROW 66' ROW 150' ROW 66' ROW

83

CONNECTIVITY
TO HWY 1804

IMPROVED
SIGHT
DISTANCE

CONNECTIVITY
TO HWY 1804

UNIFORM
INTERCHANGE
SPACING

EXISTING
OVERPASS

DISTANCE
FROM
URBAN
CENTER

COUNTY HWY 10

FLOODING
ALONG
APPLE
CREEK
Apple Creek Rd

REDUCED
TRAFFIC
RELIEF

CONNECTION
TO CITY OF
LINCOLN

CITY OF
LINCOLN

REGIONAL NORTH-SOUTH
BELTWAY STUDY

BISMARCK/MANDAN,
NORTH DAKOTA

BELTWAY ALTERNATIVE ANALYSIS

- | | |
|------------------------------|-------------------|
| Feasible Posted Speed Limits | Rivers & Streams |
| 30 - 40 MPH | National Wetlands |
| 45 - 55 MPH | Floodway |
| Transmission Lines | 100yr Floodplain |
| Railways | |

Figure 6

LF OF FLOODPLAIN
5,134'
3,273'

WATERWAY CROSSINGS
3

LF OF WETLANDS
0'
145'

LF OF WETLANDS
200'
335'

LF OF FLOODPLAIN
4,575'
1,380'

WATERWAY CROSSINGS
1

ACCESS POINTS
11
10

The following matrix was prepared to summarize some of the key criteria used to evaluate beltway route alternatives.

BURLEIGH COUNTY BELTWAY ROUTE COMPARISON MATRIX						
EVALUATION CRITERIA	EAST LEG		NORTH LEG		SOUTH LEG	
	66th Street	80th Street	84th Ave	71st Ave	48th Ave	62nd Ave
Cost / Environmental						
Waterway Crossings	No Difference		√			√
Flooding	No Difference		No Difference		No Difference	
LF of Wetlands Crossed	√		No Difference		No Difference	
LF of Floodplain Crossed	√		No Difference			√
Existing Ground Profile	√		√		√	X
Operational						
Feasible Posted Speed Limit	√		√		No Difference	
Number of Access Points	√		√		No Difference	
Early Interchange Justification	√			√	No Difference	
Traffic Relief from US 83 & Centennial Rd	√		No Difference		No Difference	
Connection to City of Lincoln	√		NA	NA	√	
Connectivity to 1804	NA	NA	X	√	No Difference	

KEY

√ = Better Alternative

X = Fatal Flaw

Recommended Alignment Alternatives: 66th Street, 71st Avenue, & 48th Avenue

VI. Local Coordination and Public Involvement

Significant efforts were made to enhance the opportunities for individuals to learn about this study and become involved. These efforts included development of a project website, thousands of direct mailings to landowners located in the project vicinity, public meetings and numerous individual conversations, and coverage by local media.

Local coordination and public involvement for this study was undertaken with three key stakeholder groups in mind: Transportation Facility Users and Adjacent Landowners, Policy Makers, and Technical Staff.

A. Transportation Facility Users and Adjacent Landowners

Transportation facility users and adjacent landowners were encouraged to participate in the Study through the public meetings and the project website. Phone conversations were held with individuals who had questions or comments beyond items covered in the public venue.

1. Public Input Meeting #1

The first public input meeting in Bismarck was held on November 22, 2007. It was jointly held with the 71st Avenue/Centennial Road Corridor Study. 2000 letters were mailed prior to the meeting to adjacent landowners and interested persons. Approximately 210 people attended the meeting.

The purpose of this meeting was to introduce study objectives and to seek early input on the full range of alternatives that should be considered by the study. Information from that meeting is provided in Appendix 5.

2. Public Input Meeting #2

The second public input meeting in Bismarck was held on July 17, 2008. 2200 letters were mailed prior to the meeting to adjacent landowners and interested persons. Approximately 72 people attended the meeting.

The purpose of the second public input meeting was to review the public input received from the first public input meeting, present the analysis conducted on the full range of alternatives, and receive feedback on preliminary alternative selection, issues and impacts. Information from that meeting is provided in Appendix 5.

3. Public Input Meeting #3

The third public input meeting in Bismarck was held on December 3, 2008. 2200 letters were mailed prior to the meeting to adjacent landowners and interested persons. Approximately 73 people attended the meeting.

The purpose of the third public input meeting was to present the draft Report and receive public input on Study recommendations. Information from that meeting is provided in Appendix 5.

B. Policy Makers

Policy makers include individuals who serve on the Burleigh County and Cities of Bismarck and Lincoln Planning Commissions and Governing Bodies. These persons were notified of the public meetings and project website through a Newsletter (See Appendix 7).

This Newsletter provided additional information intended to keep the policy makers informed of the Study's progress, initial results and things they should be aware of. Additionally, Ulteig staff appeared before the governing bodies on three occasions prior to the Plan's adoption meetings. These personal appearances were intended to provide additional opportunity for local officials to ask questions and understand the direction and results of the Study.

The overall intent of the additional efforts to coordinate with local policy makers was to receive interim guidance from them on project activities and to position them for important decisions they would need to make later in the Study process.

C. Technical Staff

Technical staff representing Burleigh and Morton Counties, and the Cities of Bismarck, Lincoln and Mandan, as well as the MPO and NDDOT served on a Steering Committee for this Study. The Committee's role was to guide the direction of the study, to review study progress and provide input on alternatives and analysis. Further, they were asked to assist in refining the alternatives and in development of recommendations.

The Steering Committee met on five occasions to discuss the study's progress and to provide direction on further efforts. Summaries of these meetings are included in Appendix 8.

VII. Responses to Public Input

This section of the Report lists some of the main questions and comments received from the general public. It also provides responses. While it is not an all inclusive list, it is intended to simplify the ability of decision makers and the general public to see how this Report addresses key issues and questions that were raised. Written comments received through the course of the study are provided in Appendix 6.

- A. The beltway should be moved further out, or the beltway is located too close to the urban area.

Response: The beltway needs to be developed relatively close to the urban area in order to serve the purposes for which it is intended. These include traffic relief on parallel routes, availability to commuters and freight haulers, linkage with area or regional destinations, and system continuity (Refer to Draft Purpose and Need in Section I.C).

A beltway located further out would have minimal traffic relief on parallel routes, would only serve commuters and freight haulers with destinations outside the urban area, would have limited linkage with area or regional destinations, and would do little to improve system continuity across localized transportation barriers.

It is noteworthy that during the first public input meeting, people along 66th Street generally suggested that the beltway should be located along 80th Street, while people along 80th Street generally thought the beltway should be located along 66th Street. It is not unreasonable to expect that a beltway planned further out of the urban area will receive similar feedback.

Development of beltway corridors typically occurs in tiers or rings around an urban area. While this Study suggests that the 71st Avenue, 66th Street, 48th Avenue corridor is the ideal location for the next beltway, it is also recommended that planning begin for another future beltway further outside the urban area.

- B. It is too late to plan or build a beltway here.

Response: Planning is often undertaken when needs become more obvious. Sometimes, a delay in planning results in activities that could have been prevented or done differently. In the case of the beltway corridor, development activity that has occurred in recent years has an influence on how the beltway can be designed and on its overall function. It is the role of elected officials and future environmental documentation to ultimately decide whether or not the level of growth has prohibited development of the beltway.

It is worth noting that the Fringe Area Road Master Plan calls for essentially every mile-line to be planned as an arterial roadway, which exhibit attributes similar to those of a beltway. Therefore, under

any scenario, the intent of local government has been for 71st Avenue, 66th Street and 48th Avenue to be planned as arterial roads.

The plan and design for the beltway corridor is essentially no different than it would be if the corridor was not on the beltway system. The planned roadway would be just as wide and the anticipated levels and types of traffic would be just as high. The primary differences correspond to the placement of an interchange along I-94 and the proposed connections with the beltway west of US Highway 83 and ND Highway 1804.

C. The beltway should be located where only non-residential development is allowed.

Response: The Bismarck-Mandan Regional Future Land Use Plan adopted October 2007 indicates that much of the undeveloped property along the 66th Street and 48th Avenue segments of the beltway is planned for commercial and industrial uses. The design and traffic levels along the proposed beltway are not anticipated to be any different than what exists along many of the other residential arterials in Bismarck and Mandan. If anything, the projected levels of traffic and the anticipated number of lanes are lower than many residential arterial corridors located within the City limits.

D. The beltway will impact residential property.

Response: Based on the public input received, placement of the beltway adjacent to residential property is currently considered to have more negative impacts than positive ones. Concerns have been raised regarding noise, safety, and other issues as well.

Given the assumption that the City of Bismarck will continue to grow, the impacts of a "Do Nothing" alternative would eventually far outweigh the impacts of implementing a plan to develop the beltway. Suggestions to develop the corridors as non-beltway arterials are not realistic, since due to the physical location of the corridors, their use as a next-tier beltway is inevitable.

E. The beltway will impact taxes or property values.

Response: We are not aware of any research that provides analysis indicating how taxes or property values will be impacted by the proposed beltway corridor. Some residents have suggested that the term, "beltway" could have a negative impact on property values. In response to this concern, an option to eliminate the term from future corridor references has been added to the Project Decisions document for consideration by elected officials.

F. How and when will right of way be acquired?

Response: Right of way in undeveloped areas will be acquired through the platting process as development occurs. Normally, the needed right of way is dedicated as part of the plat and at no cost to the governing agency. If roadway improvements precede platting, acquisition may be initiated by the

governing agency and may include land purchases. Right of way acquired during project development will follow federally established guidelines.

In developed areas, the amount of right of way available in most areas will be sufficient to enable construction of the proposed, 3 lane beltway facility with no permanent acquisition needed. Temporary construction easements may be needed to address localized conditions. Exceptions to this include the vicinity of the future I-94 interchange where utilities or a 5 lane roadway are needed. Other acquisition is expected to occur in the distant future when traffic and safety conditions dictate additional improvements.

G. The beltway is unsafe for children.

Response: Bicycle and pedestrian facilities will be provided with separation from the beltway corridor. Education and standard care with children apply the same for the beltway as they do along any roadway.

H. The beltway is needed and the location should be along 71st Avenue, 66th Street and 48th Avenue South.

Response: Each of the proposed beltway corridors have identified flaws, ranging from excessive access, to limited available right of way, to potential residential neighborhood impacts. Yet, from the standpoint of addressing the purpose and need for the beltway corridor, the proposed locations accomplish the most.

VIII. Alternatives Selection and Recommendations

It is the conclusion of this Study that a beltway type roadway facility is needed to service the next tier of development and to relieve traffic on US Highway 83 and Centennial Road. Implementation of roadway improvements is expected to occur over many years and will follow the standard evolutionary process of roadway corridor development.

It is anticipated that through the Year 2030, a 2 lane, rural corridor with turn lanes will provide ample traffic capacity in most locations. A possible exception to this is the vicinity of the future interchange at I-94. And while for many years most of the corridors should require no more than a 2 lane facility with turn lanes, it is recommended that right of way preservation account for an ultimate 5 lane roadway facility.

It is recommended that the 71st Avenue North, 66th Street, and 48th Avenue South corridors be preserved as the future location of the beltway facility. Right of way should be preserved for interchanges at I-94/66th Street and at US Hwy 83/71st Avenue North.

Valid statements made by the public indicate that it is not too early to start planning for a second-tier beltway to handle longer commuter trips. This planning should begin at the LRTP level and continue with future corridor planning efforts over time.

A. Corridor Funding

Construction cost estimates for the preferred alternatives were prepared in today's dollars with no inflation. They are based on an average cost of \$1.8 million/mile for a roadway similar to the reconstructed Highway 1804 and are summarized as follows:

1. Short Term Recommendations (Within 5 Years)

Improvements recommended to be implemented within the next 5 years include safety and turn lane improvements along 71st Avenue North from US Highway 83 to 66th Street. At the time of this Study, no improvements along 71st Avenue had been programmed. The estimated cost of construction is \$1.2 million.

In addition, short term improvements to key intersections along 66th Street were recommended by the Lincoln to Bismarck Roadway Connection Transportation Study Report dated May 2006. The Report called for turn lane and sight distance improvements at the East Main Avenue, Apple Creek Road and Lincoln Road intersections along 66th Street at an estimated construction cost of \$0.5 to \$1.5 million.

2. Mid Term Recommendations (6-10 Years)

Mid term improvements are anticipated to focus on the transportation corridor improvements that will need to be in place to support development and the eventual construction of a 66th Street interchange. Most likely, these improvements will include:

- Construction of 66th Street from 71st Avenue to East Century Avenue - \$4.7 million
- Extension of East Century Avenue eastward to 66th Street - \$2.7 million
- Construction of 17th Avenue/Divide Avenue east to 66th Street - \$1.8 million

3. Long Term Recommendations (11-20+ Years)

Long term improvements are anticipated to include construction of the 66th Street interchange, probably early in the time range. These improvements will need to include improvements along 66th Street between 17th Avenue and East Century Avenue. Other improvements along 66th Street and 48th Avenue not previously completed are also anticipated during the long term element of the Plan. Construction costs for these improvements are estimated at:

- 66th Street interchange and roadway connections to East Century Avenue and 17th Avenue - \$10.0 million
- 66th Street improvements (17th Avenue to 48th Avenue South) - \$13.0 million (Includes \$4.0 million for RR grade separation and new Apple Creek bridge crossing)
- 48th Avenue South improvements (66th Street to Highway 1804) - \$7.4 million (Includes \$2.0 million for Apple Creek bridge crossing)

Cost Sharing Plan

Recommendations	Lead Agency	Potential Funding Sources
Short Term (Within 5 Years)		
71 st Avenue Improvements	Burleigh County	County
Misc. 66 th St. Intersections	Burleigh County	50% County, 50% Lincoln
Mid Term (6-10 Years)		
66 th St. (71 st Ave. – Century Ave.)	Burleigh County	To Be Determined
East Century Ave. to 66 th Street	City of Bismarck	80% Federal, 20% City
17 th Ave. to 66 th Street	City of Bismarck	To Be Determined
Long Term (11-20+ Years)		
I-94/66 th Street Interchange	City of Bismarck	80% Federal, 20% City
66 th St. (17 th Ave. – 48 th Ave. S.)	Burleigh County	To Be Determined
48 th Ave. S. (66 th St. – Hwy 1804)	City of Bismarck	To Be Determined

IX. Corridor Implementation Action Plan

For this Corridor Study to achieve its intended purposes, it is important for local jurisdictions to understand their roles and to use this Report for guidance on efforts they may undertake to advance project development. The previous chapter gives guidance for which jurisdictions may want to assume the lead agency role in project development.

The following activities are recommended for the Cities of Bismarck and Lincoln, and Burleigh County to undertake:

1. **Additional Studies** may be needed to provide further resolve issues that remained at the end of this Study. These include:
 - a. I-94/66th Street Interchange Corridor Study & Interchange Justification Report
 - b. 66th Street/71st Avenue North Intersection Planning (Anticipated coordination with vicinity landowners pertaining to implementation of the diagonal connection of 66th Street and 71st Avenue North)
 - c. Class II or Class III (more detailed) Cultural Resource Inventory on preferred corridor alignments
2. **Corridor Preservation** efforts should be ongoing as developments along the preferred corridor alignments are considered and approved. This includes preservation of adequate right of way and management of access along the corridor consistent with the alternatives that are selected.

It is not anticipated that the City or County will have funding to acquire additional right of way in areas that have already been developed. In cases where at least 150 feet of right of way exists, additional right of way should not be needed until such time as corridor segments require conversion to a 5 lane roadway facility.

In developed areas where less than 150 feet of right of way exists, City and County staff should consider whether the means to acquire additional right of way exists and under what conditions the right of way can be expanded. Where platting has yet to be completed, it is recommended that 200 feet of right of way be acquired during the platting process.

3. **Pedestrian and Bicycle Facility Development** efforts should be undertaken as suggested by local priorities and as funding becomes available. These projects may come before, during, or after roadway improvements are implemented.

X. Decisions Document

**Bismarck-Mandan
Regional North South Beltway Corridor Study**

Bismarck-Lincoln-Burleigh County Regional Corridor Element

Project Decisions

1. Should the 71st Avenue North, 66th Street and 48th Avenue South corridors be preserved as part of a beltway type facility?

The preferred alignment based on a technical analysis of the study area and input from the study's Technical Committee for the "Beltway Facility" includes the 71st Avenue North, 66th Street and 48th Avenue South corridors. Other corridors considered were 84th Avenue North, 80th Street, and 62nd Avenue South. Local staff supports preservation of 71st Avenue North, 66th Street and 48th Avenue South as part of a beltway type facility.

Yes X No

2. Should the beltway designation be eliminated in reference to these corridors?

After talking with interested Burleigh County land owners it is obvious that "not" referring to our beltway corridors as "beltway corridor" would go a long ways to appeasing their concerns (dissatisfaction). This is seemingly an easy and pain free fix. The road characteristics (ROW & speed limit) are the same for both an arterial and beltway corridor. However, for a short term gain (less public dissention), are we doing a disservice to future land purchasers by not referring to it as a beltway corridor? How else would they find out a street was planned as a future beltway corridor? Local staff supports maintaining the beltway name in future references to these corridors.

Yes No X

3. Should City of Bismarck and Burleigh County staff work with land owners and developers to implement a diagonal connection between 66th Street and 71st Avenue North?

The diagonal connection does not follow established section lines or property lines and no right of way currently exists for this alignment. It was proposed because it provides a limited access connection between the two corridors while avoiding existing homes. Some current landowners have expressed opposition because the new corridor would bisect their property and impact how the area develops. Others are concerned that it places the corridor closer to their homes than was evident from the original alignment. Still, others living near the intersection have expressed support. Local staff supports this alignment and desires Commission direction to pursue further discussions with landowners and developers toward implementation.

Yes X No

4. Should right of way be preserved for an I-94 interchange at 66th Street?

Alternatives that slide the I-94 interchange alignment to the east or west of 66th Street were prepared to reduce or eliminate impacts to an existing residence and to avoid expensive relocation (costs estimated at \$500,000-\$750,000) of a communications tower. While sliding the alignment east or west does reduce impacts near the section line, it creates new impacts to a farmstead further east, or to the landfill further west. Local staff supports a preliminary selection of the route located on the section line.

Yes, on the section line Yes, offset east _____ Yes, offset west _____ No _____

5. Should right of way be preserved for an interchange at US Highway 83 and 71st Avenue North?

The NDDOT has indicated they are opposed to an interchange at this location because it is not consistent with other types of traffic control common along the US Highway 83 corridor. In-state experience has indicated that a mix of interchanges and signalized intersections can result in traffic operational and safety issues.

Local staff recognizes that unless right of way for an interchange is preserved as this area develops the ability to construct an interchange at this location may be prohibitive. Further, an interchange may provide better long range traffic operations at this location than would a signalized intersection. Therefore, local staff supports preservation of an interchange at this location.

Yes No _____

Mandan-Morton County Regional Corridor Element

Project Decisions

6. Should the 24th Avenue corridor be preserved according to current City and County standards as the beltway (minor arterial) route?

Local staff supports preservation of the 24th Avenue corridor as the preferred location for the beltway. In the interim, Highway 25, Business 94 and ND Highway 6 would serve as beltway routes on the west side of Mandan.

Yes No _____

7. Should right of way be preserved for an I-94 interchange at 24th Avenue?

Local staff supports preservation of an I-94 interchange at 24th Avenue. While other locations were considered, this location is ideal for interchange spacing between existing interchanges.

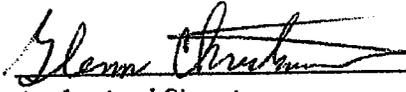
Yes No _____

8. Should the beltway designation be eliminated in reference to these corridors?

After talking with some land owners it is obvious that "not" referring to our beltway corridors as "beltway corridor" would go a long ways to appeasing their concerns (dissatisfaction). This is seemingly an easy and pain free fix. The road characteristics (ROW & speed limit) are the same for both an arterial and beltway corridor. However, for a short term gain (less public dissention), are we doing a disservice to future land purchasers by not referring to it as a beltway corridor? How else would they find out a street was planned as a future beltway corridor? Local staff supports maintaining the beltway name in future references to these corridors.

Yes _____ No X

The Bismarck-Mandan Metropolitan Planning Organization Policy Board, at their May 19, 2009 meeting hereby approved these project decisions and approved the final Bismarck-Mandan Regional North-South Beltway Corridor Study report.



Authorized Signature
Bismarck-Mandan MPO

6-4-09
Date

**Bismarck-Mandan
Regional North South Beltway Corridor Study**

Bismarck-Lincoln-Burleigh County Regional Corridor Element

Project Decisions

1. **Should the 71st Avenue North, 66th Street and 48th Avenue South corridors be preserved as part of a beltway type facility?**

The preferred alignment based on a technical analysis of the study area and input from the study's Technical Committee for the "Beltway Facility" includes the 71st Avenue North, 66th Street and 48th Avenue South corridors. Other corridors considered were 84th Avenue North, 80th Street, and 62nd Avenue South. Local staff supports preservation of 71st Avenue North, 66th Street and 48th Avenue South as part of a beltway type facility.

Yes No

2. **Should the beltway designation be eliminated in reference to these corridors?**

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Yes No

3. **Should City of Bismarck and Burleigh County staff work with land owners and developers to implement a diagonal connection between 66th Street and 71st Avenue North?**

The diagonal connection does not follow established section lines or property lines and no right of way currently exists for this alignment. It was proposed because it provides a limited access connection between the two corridors while avoiding existing homes. Some current landowners have expressed opposition because the new corridor would bisect their property and impact how the area develops. Others are concerned that it places the corridor closer to their homes than was evident from the original alignment. Still, others living near the intersection have expressed support. Local staff supports this alignment and desires Commission direction to pursue further discussions with landowners and developers toward implementation.

Yes No

4. Should right of way be preserved for an I-94 interchange at 66th Street?

Alternatives that slide the I-94 interchange alignment to the east or west of 66th Street were prepared to reduce or eliminate impacts to an existing residence and to avoid expensive relocation (costs estimated at \$500,000-\$750,000) of a communications tower. While sliding the alignment east or west does reduce impacts near the section line, it creates new impacts to a farmstead further east, or to the landfill further west. Local staff supports a preliminary selection of the route located on the section line.

Yes, on the section line Yes, offset east Yes, offset west No

5. Should right of way be preserved for an interchange at US Highway 83 and 71st Avenue North?

The NDDOT has indicated they are opposed to an interchange at this location because it is not consistent with other types of traffic control common along the US Highway 83 corridor. In-state experience has indicated that a mix of interchanges and signalized intersections can result in traffic operational and safety issues.

Local staff recognizes that unless right of way for an interchange is preserved as this area develops the ability to construct an interchange at this location may be prohibitive. Further, an interchange may provide better long range traffic operations at this location than would a signalized intersection. Therefore, local staff supports preservation of an interchange at this location.

Yes No

Comments:


Authorized Signature

May 19, 2009
Date

City of Bismarck

**Bismarck-Mandan
Regional North South Beltway Corridor Study**

Bismarck-Lincoln-Burleigh County Regional Corridor Element

Project Decisions

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The preferred alignment based on a technical analysis of the study area and input from the study's Technical Committee for the "Beltway Facility" includes the 71st Avenue North, 66th Street and 48th Avenue South corridors. Other corridors considered were 84th Avenue North, 80th Street, and 62nd Avenue South. Local staff supports preservation of 71st Avenue North, 66th Street and 48th Avenue South as part of a beltway type facility.

Yes X No _____

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Yes X No _____

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Yes X No _____

4. Should right of way be preserved for an I-94 interchange at 66th Street?

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Yes, on the section line Yes, offset east _____ Yes, offset west _____ No _____

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Local staff recognizes that unless right of way for an interchange is preserved as this area develops the ability to construct an interchange at this location may be prohibitive. Further, an interchange may provide better long range traffic operations at this location than would a signalized intersection. Therefore, local staff supports preservation of an interchange at this location.

Yes No _____

Comments:

The county commission recommended the name be changed to arterial roadway instead of Beltway.

James Peluso

Authorized Signature

5/18/09

Date

Barleigh County

**Bismarck-Mandan
Regional North South Beltway Corridor Study**

Bismarck-Lincoln-Burleigh County Regional Corridor Element

Project Decisions

1. Should the 71st Avenue North, 66th Street and 48th Avenue South corridors be preserved as part of a beltway type facility?

The preferred alignment based on a technical analysis of the study area and input from the study's Technical Committee for the "Beltway Facility" includes the 71st Avenue North, 66th Street and 48th Avenue South corridors. Other corridors considered were 84th Avenue North, 80th Street, and 62nd Avenue South. Local staff supports preservation of 71st Avenue North, 66th Street and 48th Avenue South as part of a beltway type facility.

Yes X No

2. Should the beltway designation be eliminated in reference to these corridors?

After talking with interested Burleigh County land owners it is obvious that "not" referring to our beltway corridors as "beltway corridor" would go a long ways to appeasing their concerns (dissatisfaction). This is seemingly an easy and pain free fix. The road characteristics (ROW & speed limit) are the same for both an arterial and beltway corridor. However, for a short term gain(less public dissention), are we doing a disservice to future land purchasers by not referring to it as a beltway corridor? How else would they find out a street was planned as a future beltway corridor? Local staff supports maintaining the beltway name in future references to these corridors.

Yes No X

3. Should City of Bismarck and Burleigh County staff work with land owners and developers to implement a diagonal connection between 66th Street and 71st Avenue North?

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Yes X No

4. Should right of way be preserved for an I-94 interchange at 66th Street?

Alternatives that slide the I-94 interchange alignment to the east or west of 66th Street were prepared to reduce or eliminate impacts to an existing residence and to avoid expensive relocation (costs estimated at \$500,000-\$750,000) of a communications tower. While sliding the alignment east or west does reduce impacts near the section line, it creates new impacts to a farmstead further east, or to the landfill further west. Local staff supports a preliminary selection of the route located on the section line.

Yes, on the section line X Yes, offset east _____ Yes, offset west _____ No _____

5. Should right of way be preserved for an interchange at US Highway 83 and 71st Avenue North?

The NDDOT has indicated they are opposed to an interchange at this location because it is not consistent with other types of traffic control common along the US Highway 83 corridor. In-state experience has indicated that a mix of interchanges and signalized intersections can result in traffic operational and safety issues.

Local staff recognizes that unless right of way for an interchange is preserved as this area develops the ability to construct an interchange at this location may be prohibitive. Further, an interchange may provide better long range traffic operations at this location than would a signalized intersection. Therefore, local staff supports preservation of an interchange at this location.

Yes X No _____

Comments:

Glenn Christma
Authorized Signature

5-19-09
Date

City of Lincoln

Mandan – Morton County Regional Corridor Element

I. Introduction

Development of a beltway for the Bismarck-Mandan area is not a new idea. The original beltway was planned in the early 1990's and extended only on the Bismarck side of the Missouri River. The beltway was planned along Century Avenue, Bismarck Expressway, Washington Street, Main Avenue, Schafer Street and Tyler Parkway. The improvements that were constructed along Tyler Parkway and Century Avenue were an implementation of that plan.

The original beltway concept, though not fully implemented, served a valuable purpose. It enabled the City of Bismarck to prioritize improvements to key corridors, which resulted in long-term traffic movement and development benefits.

In time and as the community continued to grow, it became apparent that another beltway should be planned to provide connectivity for the entire community to serve the next tier of development. The implementation of another beltway was again proposed in the 2001 Long Range Transportation Plan (LRTP). That Plan called for a beltway that included the Northern Bridge Corridor, extensions along 71st Avenue, 66th Street, 48th Avenue South, and a Southern Bridge Corridor on the Burleigh County side of the Missouri River. On the Morton County side of the Missouri River, the planned beltway extended from the Southern Bridge Corridor, north along 24th Avenue, and east on 37th Avenue to connect back into the Northern Bridge Corridor.

Following adoption of the 2001 LRTP, the 2005 LRTP and the Northern Bridge Corridor Study were completed and continued to promote development of a new beltway.

The Bismarck-Mandan Metropolitan Planning Organization (MPO) initiated the Regional North-South Beltway Corridor Study on August 22, 2007. This study, completed June 1, 2009, had the following objectives:

- To determine whether there is justification for the north-south beltway corridors, and if so, to document it.
- To select the short and long range optimum alignments for the north-south beltway corridors. (This selection would be based on corridor-level analysis and would be subject to future environmental considerations.)
- To identify potential impacts and associated mitigation strategies.
- To facilitate stakeholder and decision maker involvement.
- To secure jurisdictional acceptance of preferred alternatives and implementation strategies.

A. Beltway Definition

This Study defines a beltway corridor as a regional roadway designed for high mobility and safety that is intended to carry commuter and truck traffic around Bismarck-Mandan's urban fringe. High mobility and safety on beltway corridors are promoted through right of way preservation, access management and elements of safety design. The beltway corridor is proposed to operate at a speed of 55 mph, except where development or other factors preclude safe operation at that speed.

It is important to recognize that the intent of the beltway, as proposed by this Study, is not to develop a facility similar to I-494/I-694 in the Minneapolis, Minnesota metropolitan area. Conditions in this region prohibit that type of facility from being established.

The term, beltway, is more an indicator of regional roadway continuity and provides a strong basis for the optimum locations for new Interstate interchanges east of Bismarck and west of Mandan. Where planned, the beltway will someday become a high priority corridor in terms of maintenance, early snow removal and funding for improvements.

B. Study Area

The Study Area for the Regional North-South Beltway Corridor Study is shown in Figure 1. The 2005 LRTP provided a starting point for this Study, as it gave possible locations for the north-south beltway corridors. Further input from the Steering Committee and the general public was received by the end of 2007 to determine the limits of the study.

C. Draft Purpose and Need

The purpose and need for the beltway, or segments of the beltway, will be fully established by future environmental documents undertaken in project development efforts. Based on this Study, the purposes of the beltway are:

- To relieve traffic on busy, parallel routes such as Sunset Drive
- To provide commuters and freight haulers with a high safety and mobility alternative to existing routes
- To provide linkage between area development and other community or regional destinations.
- To provide regional roadway system continuity. Barriers to roadway system continuity include rough terrain, the Missouri and Heart Rivers, Interstate 94 and the railroads. These barriers interfere with roadway system continuity when there are insufficient crossings to address the needs of traffic to efficiently get to their destination.

The need for the beltway was viewed from the standpoints of preservation and the physical development of the beltway facility. Preservation of the beltway is needed because of the general benefits, traffic/roadway benefits, development benefits and landowner benefits that result:

General Benefits of Corridor Preservation

- Facilitates better decision making
- Enables jurisdiction to secure most appropriate location
- Helps jurisdictions prioritize needs and plan services
- Reduces the cost of future improvements

Traffic/Roadway Benefits of Corridor Preservation

- Promotes optimal transportation infrastructure spacing
- Enables jurisdictions to manage access, thereby securing a safer roadway facility for the future
- Secures adequate space for future facilities

Development Benefits of Corridor Preservation

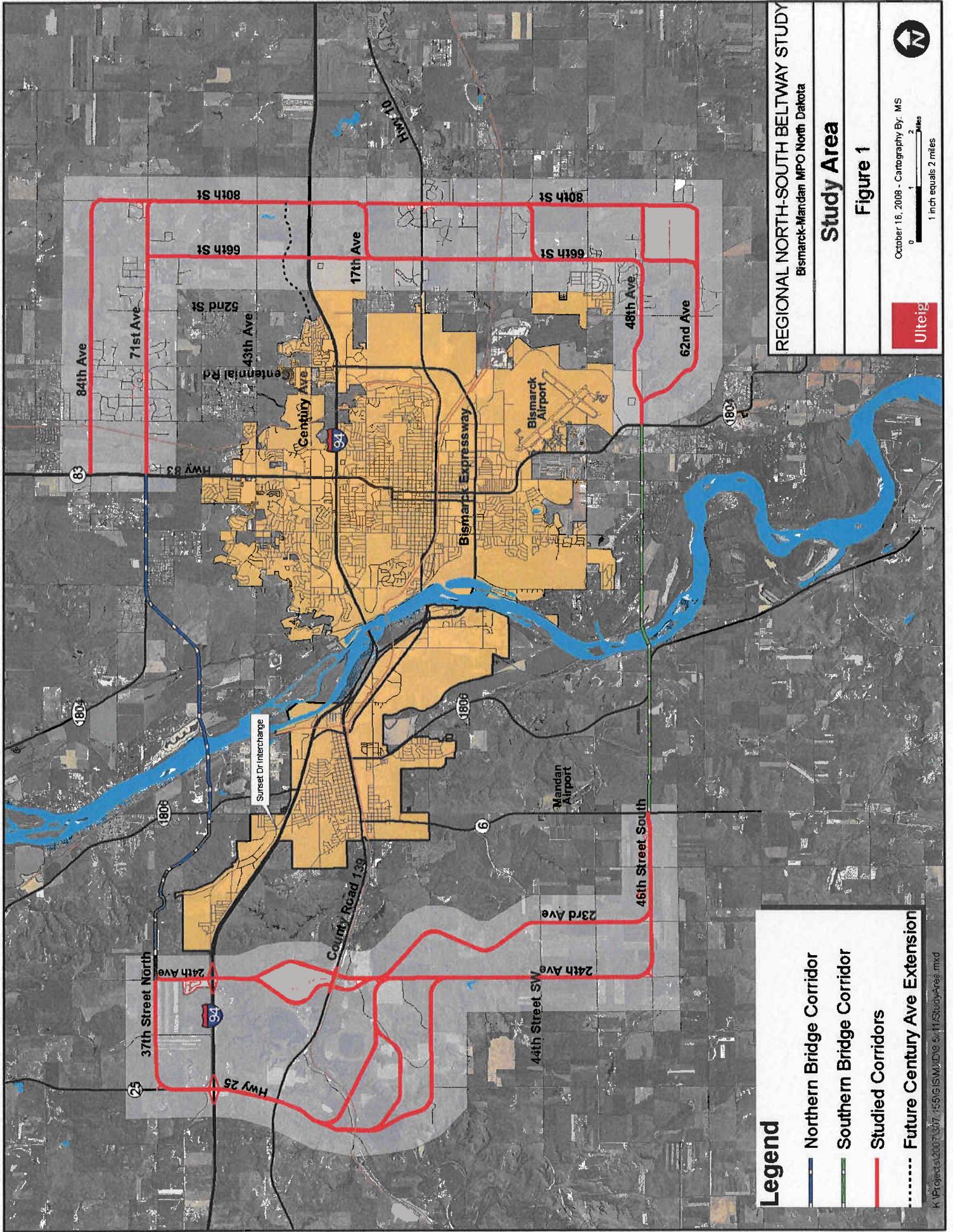
- Facilitates future area growth
- Protects against adverse development
- Results in financial benefits

Landowner Benefits of Corridor Preservation

- Prepares landowners for the future
- Increases opportunities to mitigate impacts

The existing need for physical improvements along the proposed beltway at this time is probably limited to responses to ongoing development. However, Mandan is growing and eventually additional transportation system improvements will be needed to support this growth. The projected need for improvements includes:

- Capacity and/or safety improvements along corridor segments
- Access or intersection improvements to address ongoing development
- Interstate access



Legend

- Northern Bridge Corridor
- Southern Bridge Corridor
- Studied Corridors
- - - - Future Century Ave Extension

REGIONAL NORTH-SOUTH BELTWAY STUDY
Bismarck-Mandan MPO North Dakota

Study Area

Figure 1

October 18, 2008 - Cartography By: MS
0 1 2 miles
1 inch equals 2 miles



II. Existing Conditions

West of Mandan, four corridors predominantly influenced the development of north-south beltway corridor alternatives. They are 37th Street North, ND Highway 25, 24th Avenue (which lies immediately adjacent to the east side of Roughrider Subdivision), and 46th Street South.

This section of the Report describes these four corridors and other existing conditions that influenced beltway corridor alternative development.

A. 37th Street North

The 37th Street North corridor exists as a rural, two lane gravel surfaced roadway. It extends from one mile east of ND Highway 25 eastward to a connection with Highland Road. It was chosen as the northern beltway because it is a section line road, it has limited development, and it provides a direct connection to one of the northern bridge corridor alignments.

B. ND Highway 25

The ND Highway 25 corridor extends north from Business 94 to an interchange at I-94, where it continues north. South of Business 94, Lyons Road meanders in a general southwesterly direction. It is a paved, two lane rural highway north of Business 94 and is located approximately 5 miles west of Sunset Drive.

Because it is the only existing north-south roadway within 5 miles on Mandan's west side, its potential to function as a beltway route was recognized in early planning efforts. South of I-94, it has the ability to carry traffic to Business 94, which can bring travelers east into Mandan or south on Highway 6.

To the north, ND Highway 25 lacks connectivity with an improved east-west route. For the purposes of this study, the 37th Street corridor was considered the anticipated beltway north of I-94.

C. 24th Avenue

The 24th Avenue corridor extends south from 37th Street to the south side of Roughrider Subdivision where it terminates in a Tee intersection with Old Red Trail on the North side of I-94. It also extends south of Business 94 as County Road 82 past the gravel pits to the landfill and beyond. It exists as a two lane, rural gravel surfaced roadway. Elsewhere within the Study Area, the 24th Avenue corridor has yet to be constructed.

The 24th Avenue corridor was originally planned by the 2001 LRTP as the beltway corridor because it was a section line corridor and other potential locations further east had adverse development adjacent to the Interstate.

The 24th Avenue corridor also appeared to provide an ideal location for a future I-94 interchange. The corridor is somewhat evenly spaced between ND Highway 25 and Sunset Drive.

South of I-94, the terrain along the 24th Avenue corridor becomes severe in some locations. Soil stability issues are known to exist along the bluffs north of the Heart River. It is assumed that similar soil stability issues exist in rough terrain found between Business 94 and 46th Street South.

D. 46th Street South

The 46th Street South corridor exists as a rural, two lane gravel surfaced roadway. It extends from ND Highway 6 westward to 24th Avenue before terminating. It was chosen as the southern beltway because it is a section line road, it has limited development along it, and it provides a direct connection to ND Highway 6 and a southern bridge corridor alignment identified in the LRTP.

E. Railroad Crossings

An east-west rail line exists and crosses the 24th Avenue corridor on the south side of Business 94. It also crosses the Lyons Road/ND Highway 25 corridor about 1 ½ miles south of Business 94. This rail line is owned and operated by Burlington Northern Sante Fe Railway Company.

Nationally, there is a strong move to eliminate at-grade railroad crossings wherever possible. Based on this direction and input from local staff, planning for the beltway assumes that all future railroad crossings will eventually be converted into grade-separated crossings.

F. Existing Rough Terrain

Existing rough terrain is a predominant factor in choosing an alignment for a future north-south beltway corridor west of the Missouri River. Rough terrain not only impacts the location and design of the corridor, but also impacts the cost of improvements. Rough terrain locations are visible from the contour information shown in the exhibits found in Appendix M-2.

III. Existing and Projected Traffic Analysis

More often than not, corridor studies develop existing and projected traffic volumes in order to determine the level of service for the corridor. The level of service represents a letter grade (A-F) of the performance of major intersections along the corridor, and for the corridor as a whole.

For this corridor study, no existing traffic operational issues were identified that merited that level of effort. Rather, the existing and projected traffic volumes were estimated in order to determine the scale of roadway improvements that should be planned to address traffic needs through the year 2030.

The primary questions that the traffic analysis needed to answer were:

- What level of traffic congestion can be expected on parallel arterial routes and can the beltway have a positive impact on relieving congestion on those routes?
- Will the facility require 1 or 2 through traffic lanes per direction by the year 2030?
- What are the turn lane needs anticipated along the beltway?
- What types of interchanges should be considered at the locations where interchanges are planned?
- What is the relationship between the northern bridge corridor and projected beltway traffic?
- What speeds should be planned along the beltway?

A. Beltway and Parallel Route Traffic

Sunset Drive and ND Highway 1806 are important arterial roadways that carry the majority of north-south traffic in Mandan and are susceptible to benefits from a beltway corridor. As Mandan and Morton County has continued to grow, it is reasonable to question the ability of these corridors to handle increases in traffic.

While Mandan Avenue and ND Highway 6 are also important north-south traffic carriers, analysis indicated that only minimal impacts on traffic along these corridors can result from beltway construction.

Existing and projected traffic along these corridors were reviewed to determine whether adequate roadway capacity is available to serve the community in the future. This analysis included a review of potential beltway corridor capacity and the ability of the beltway to relieve traffic on these corridors.

Existing Average Daily Traffic (ADT) volumes for the Study Area were available from the 2006 Traffic Volume Map. Based on a review of that map, average daily traffic volumes in the vicinity of the Interstate along corridors in the Study Area are:

Year 2006 Average Daily Traffic (Vehicles Per Day)

- Sunset Drive – 10,000
- ND Highway 1806/Collins Avenue– 4,650

The Bismarck-Mandan Metropolitan Planning Organization’s Travel Demand Model was used to estimate projected Average Daily Traffic volumes for the year 2030. Based on a review of the model and assuming no significant beltway improvements are made, average daily traffic volumes in the vicinity of the Interstate along corridors in the Study Area are estimated at:

Year 2030 Average Daily Traffic (Vehicles Per Day)

- Sunset Drive – 16,000
- ND Highway 1806/Collins Avenue– 5,000

Based on the projected levels of traffic, the Sunset Drive corridor will experience traffic congestion by the year 2030 unless the beltway corridor is constructed. A comparison of projected traffic volumes associated with beltway and interchange improvements is provided in Appendix M-1 of the Report.

B. Beltway Traffic Lane Needs

Both 3 and 5 lane typical sections were considered to address future traffic needs along the beltway corridor. Based on historical population and employment growth and development patterns, the traffic analysis indicates that a 3 lane typical section should meet the traffic needs for the majority of the corridor through the year 2030.

Corridor preservation for a 5 lane typical section is recommended because at some point in the future, additional traffic may exceed the capacity of a 3 lane typical section. Preservation of adequate right of way for the 5 lane typical section assures that the long range traffic needs along the corridor can be addressed without unnecessary future right of way acquisitions and related impacts.

C. Turn Lane Needs

Turn lanes provide benefits both from a traffic capacity standpoint and from a traffic safety standpoint. This Study proposes that left turn lanes be provided for all access locations if possible. Right of way for double left turn lanes should be reserved at potential high traffic generators, including all section line corridors. Minimum requirements for turn lane storage and design tapers are based on design speed and are established by state and federal guidelines.

Access points that are close to major intersections should be eliminated or relocated further from the intersection if possible. These access points can present significant safety concerns in the future if not addressed. Beltway alternative exhibits provide recommendations to address these conditions.

D. Interchange Types

Various interchange types were considered for the proposed 24th Avenue interchange along I-94. Given that major traffic movements occur to and from the urban area, replacement of interchange ramps with loops was found undesirable. Therefore, only diamond interchange configurations were recommended (See Figure M9 in Appendix M-2).

E. Relationship with Northern Bridge Corridor

Based on a review of beltway and parallel corridor traffic volumes, the Northern Bridge Corridor would have the following impacts on regional north-south traffic:

- It would reduce projected year 2030 traffic on Sunset Drive by 1,100 to 2,800 vehicles per day, depending on the presence of an overpass or interchange at 24th Avenue South
- It would not significantly impact traffic volumes along Collins Avenue/ND Highway 1806
- It would increase traffic on the beltway near the 24th Avenue interchange by 2,400 vehicles per day

The analysis indicates that the Northern Bridge Corridor would increase use of the north segment of the beltway by as much as 2,400 vehicles per day.

F. Beltway Speed

Based on definitions found in the 2000 Highway Capacity Manual, the beltway has characteristics that indicate it would be classified as a Class I or Class II urban street. These characteristics include low to medium development; low driveway access density; separated left turn lanes; and important to very important mobility function.

Free flow speeds for a Class I urban street range from 45-55 mph, whereas free flow speeds for a Class II urban street range from 35-45 mph. Wherever feasible, a design speed of 65 mph was used for all beltway alternatives. Horizontal curves followed a 65 mph design assuming a 6 % superelevation. Exceptions are noted in the corridor exhibits. The primary street characteristic that differentiates where lower speeds should be applied is driveway access density.

Posted speed limits are typically set based on corridor design, field studies of traffic speed or on perceived or actual safety concerns. As traffic increases, speeds will generally drop. This is especially the case in areas where driveway density is higher and in neighborhood settings.

Under today's conditions, existing segments of all studied beltway alternative corridors operate as rural highways with speeds typically posted at 55 mph. No changes in existing speed are recommended. Future adjustments in speed along segments of the beltway should be undertaken based on speed study and safety analysis. Future posted speeds along the corridor should range from 35 mph to 55 mph as conditions warrant.

IV. Issues Identification and Analysis

This section provides a listing of the issues identified from technical analysis and from the public process.

A. Beltway and Interchange Location

This issue pertains to selection of the optimal location for the beltway and an interchange along I-94. This issue is addressed in the alternative identification and evaluation sections of the Report.

B. Corridor access

Access along the beltway corridor was addressed on an individual, case by case basis. The intent of the analysis was to consider ways to minimize the impacts of access on corridor safety and mobility. Methods used to minimize access impacts included:

- Eliminating or combining access locations
- Relocating access to more favorable locations
- Moving access from the beltway onto another route
- Aligning access with other access locations
- Increasing the spacing between access points
- Use of frontage or backage roads
- Planning access for currently undeveloped areas

Regardless of the selected corridor for the beltway, pre-existing access conditions must be adequately accounted for. In many cases, there is no solution other than maintaining access as it exists today. In cases where an alternative exists that minimizes access impacts on the beltway while maintaining adequate property access, that alternative has been incorporated into the Report exhibits.

The cumulative impacts of poorly managed access along an arterial corridor can greatly affect the safety and mobility of a corridor. Often, these impacts are added one access concession at a time. Given the high safety and mobility standard desired for the beltway, access management should be strongly considered in future upgrades that allow enhancement of existing access conditions and preservation to limit access in the future.

C. Typical Section and Right of Way

The typical section and right of way needed for the beltway are issues because they impact the speed of drivers and the impacts of construction. Alternatives for these design elements are included in Section V.B of the Report

D. Corridor Design and Posted Speed

The corridor design and posted speed for the beltway are issues because they also impact the speed of drivers and the impacts of construction. Where a high level of access will be maintained along the corridor, higher speeds are detrimental to corridor safety. Alternatives for these design elements are included in Section V.B of the Report.

E. Pedestrian/bicycle safety

As traffic volumes increase and roadway improvements are made, pedestrian and bicycle safety are important issues to address. Development of sidewalk facilities that accommodate both pedestrians and bicycles is recommended along the beltway corridor. The sidewalk facility should be at least 5 feet from the pavement edge to provide adequate separation between users and vehicles.

Intersections along the beltway should be adequately signed and marked in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). Since in many locations, there will not be stop signs controlling beltway traffic, additional grade separated facilities may need to be planned in areas of heavy pedestrian or bicycle activity.

F. Truck traffic

Truck traffic can be a major source of traffic noise. It also needs to be accounted for when determining the optimal design features of a corridor. This Study recommends that future corridor improvements accommodate Interstate semi-trucks up to a 65 foot standard wheel base (WB-65) size wherever applicable.

G. Utility impacts

The primary utility impacted along the beltway corridor is the transmission line located in the vicinity of the proposed I-94/24th Avenue interchange. Information concerning this impact is included in Appendix 6. Other utilities located or proposed along the beltway will be addressed in detail during the development stages of future projects.

H. Social Issues

Many technical and non-technical issues can have social implications. Social issues can include land use impacts, neighborhood impacts, increased traffic, traffic noise, truck activity, environmental and visual impacts among others. Social issues are most pronounced in locations of existing residential development.

A concise analysis and response to these issues cannot be found in a single location within this Report. Rather, the analysis and response is provided throughout the text of this Report and some of the more common and specific social issues that were raised are addressed in Section VII within the common questions and responses narrative of the Report.

I. Surrounding Future Land Use

The Bismarck-Mandan Regional Future Land Use Plan provides guidance on the types of land use that is anticipated along either side of the beltway corridor. The Plan indicates that much of the undeveloped land adjacent to the 24th Avenue corridor is recommended for commercial or industrial development. Along the ND Highway 25 corridor, a mix of commercial, industrial and residential development is proposed.

In areas where residential areas transition to commercial areas, buffers are proposed to enable the transitions to occur.

J. Environmental Issues

Environmental issues include potential impacts to air quality, noise and vibration, water quality, threatened and endangered species, wetlands, floodways or floodplains, cultural resources, environmental justice, and others. A detailed investigation into these potential impacts was beyond the scope of this Study and would be included as part of future project development.

A limited analysis was completed regarding some of these environmental issues. Discussion of the completed analysis and findings follow:

a) Cultural Resources

A Class I Cultural Resource Inventory was completed in February 2008 by Beaver Creek Archaeology, Inc. (See Appendix 9). This Inventory is a literature search that provides knowledge of the cultural resources and the potential of cultural resources within the project area. Results of this effort are summarized as follows:

- The proposed project area is located in a region that has a high potential for archaeological sites based upon the number of known sites in the study area. Therefore, a Class II Reconnaissance Inventory or Class III Intensive Cultural Resource Inventory should be performed prior to implementation of any improvements.
- No known archaeological, historic or architectural sites were located within the immediate vicinity of the proposed corridor. Sites that were identified are over ½ mile distant.

b) Noise Analysis

Based on a review of projected traffic volumes and speeds, noise levels along the corridor will not exceed Federal Noise Guidelines for residential property. While noise levels will increase as traffic increases, a noise ordinance can be implemented to regulate use of Jake Brakes on trucks.

c) Floodway or floodplain

Impacts that roadway improvement projects have on the floodway or floodplain need to be identified and either avoided or mitigated. While analysis of avoidance or mitigation was beyond the scope of this study, the areas of impact were preliminarily identified and used for alternative comparison purposes.

K. Issue Avoidance or Mitigation

Two alternatives were considered to respond to the social and environmental issues that exist: relocate the beltway corridor or mitigate the issues.

Relocation of the beltway corridor further from Mandan has been considered since the onset of the Study. Beyond relocation to ND Highway 25, other corridors were determined to be ineffective in addressing the purpose and need for the beltway corridor.

Many social issues that arise (increased traffic, noise, truck activity) are components of continued new development. Demand for beltway improvements will likely follow development activity. Social issues may result from the new growth and development, and are less likely to result from the presence of an improved roadway facility.

Mitigation of some social issues can be addressed through corridor and boulevard design. Trees and landscaping can be built within the boulevard to provide visual shielding.

Acquisition of right of way in developed areas can be delayed until traffic conditions warrant more than a 3 lane roadway section. This delay may be 20 years or longer in many locations.

V. Alternatives Development and Evaluation

The alternatives development and evaluation process followed a series of four steps. This section of the Report provides a list and explanation of the first three steps. Alternatives selection and recommendations are covered in Chapter VIII.

Alternatives Development and Evaluation Process

- A. Identify Initial Beltway Route Location Alternatives
- B. Establish Beltway Design Criteria
- C. Refine and Compare Corridor Alignments
- D. Alternatives Selection and Recommendations

A. Identify Initial Beltway Route Location Alternatives

This Study needed to identify which alternatives were reasonable to consider as viable beltway alternatives. The draft purpose and need statement listed in the first section of the Report was used as the basis for this determination. The following criteria and methods were used to identify beltway route location alternatives.

- Locations that had been proposed by the LRTP were used as a starting point.
- Location of the beltway needed to be close enough to the urban area to effectively relieve traffic from congested portions of Sunset Drive.
- Location of the beltway should be able to align with a future I-94 interchange. Likewise, a future I-94 interchange should be planned where the future beltway is located.
- Location of the beltway should align with or have reasonable connectivity with future north and south extensions to the Missouri River, with potential for crossing the Missouri River.
- A brainstorming session was held with the Steering Committee to identify potential routes that had merit.
- The general public was asked whether other route alignment alternatives should be considered beyond those that were originally presented at the 1st public input meeting.

Having considered the issues and input received, the initial alignments were very general and no detailed analysis was available to establish the alignments. The early preliminary alignments along these corridors were ultimately revised and are shown in Appendix M-3.

B. Establish Beltway Design Criteria

Once the full range of alternatives had been identified, design criteria critical to the safety and mobility of the beltway were established. These design criteria are shown in the following Table.

DESIGN FEATURE	BELTWAY CORRIDOR	ARTERIAL CORRIDOR
Design Speed	55-65 mph (Preferred)	40-45 mph (Preferred)
	35-45 mph (Minimum)	35 mph (Minimum)
Expected Posted Speed	55 mph & Varies	45 mph
Projected Level of Service	C or Better	C or Better
Clear Zone (ft)	46 (65 mph)	28 (45 mph)
	28 (45 mph)	10 (35 mph)
Maximum Grade	4% (65 mph)	6% (45 mph)
	6% (45 mph)	7% (35 mph)
Minimum Stopping Sight Distance (ft)	645 (65 mph)	360 (45 mph)
	360 (45 mph)	305 (35 mph)
Minimum Passing Sight Distance (ft)	2285 (65 mph)	1625 (45 mph)
	1625 (45 mph)	1280 (35 mph)
Access Spacing (ft)	1320 (Recommended)	1320 (Recommended)
ROW (ft)	200 ft (Preferred)	200 (Preferred)
Lane Width (ft)	12	12
Shoulder Width (ft)	8	6 - 8
Preferred Shoulder Type	paved	paved
Turn Lane Width (ft)	12	12
Turn Lane Length (ft)	560 (65 mph)	varies (45 mph)
	varies (45 mph)	varies (35 mph)
Inslope (H:V)	6:1	6:1 (45 mph)
Normal Ditch (depth x width) (ft)	4 x 24	4 x 24 (45 mph)
Backslope (H:V)	3:1	3:1 (45 mph)
Minimum Bridge Width (New) (ft)	40	40
Approach & Ditch Block Slopes (H:V)	10:1	10:1 (45 mph)
Interchange @ I-94	Yes	Possible Overpass

A discussion of some of the more important design parameters follows:

1. Design Speed and Access Management

In order for the beltway to effectively serve commuter traffic, higher design speeds are beneficial. Yet, in areas where more access is allowed, safety can be compromised if the speed of the corridor is too high.

It is important for access to be managed to enable traffic to operate more safely and at higher speeds. Where significant access already exists, the posted speed of the beltway corridor should be lowered to allow traffic to enter and exit the corridor more safely.

2. Projected Level of Service

The level of service represents a letter grade (A-F) of the performance of major intersections along the corridor, and for the corridor as a whole. At a Level of Service C, most people feel that delays are at an acceptable level. Further, Level of Service C or better is strongly encouraged for federally funded projects.

3. Clear Zone

The clear zone refers to the unobstructed, relatively flat area provided beyond the edge of the traveled way for the recovery of errant vehicles. It is measured from the edge of the through lane into the ditch. Federal guidance provides the widths that are acceptable and they are based on speed, vehicle volume and embankment slope.

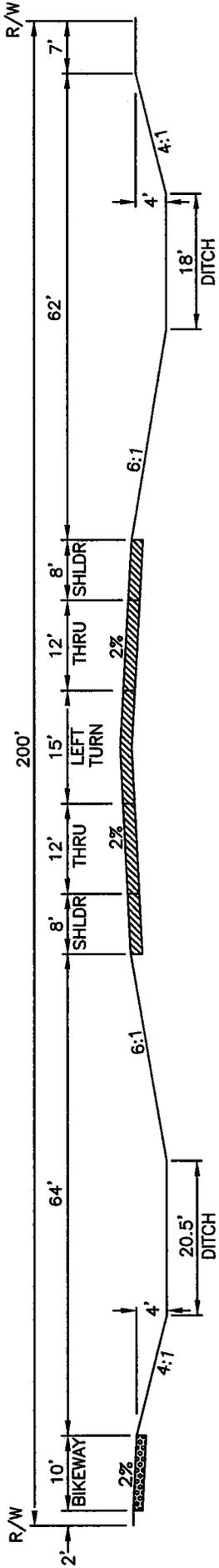
4. Right of Way and Typical Section

Adequate right of way along the beltway is needed to enable construction of the ultimate typical roadway section that may be required in the future. Typically, this equates to the level of traffic projected at least 20 years into the future.

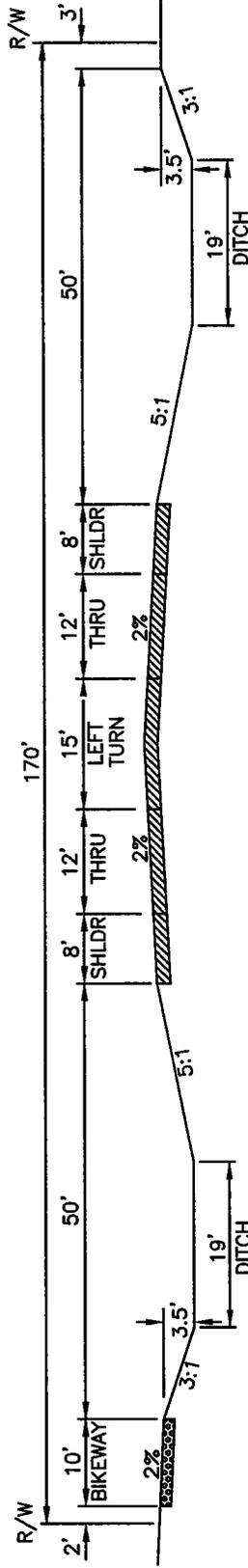
Based on the traffic analysis, a single through lane in each direction plus turn lanes should address the projected traffic along most segments of the corridor over the next 20 year period (see Figure 2).

This study proposes adequate right of way be preserved to enable construction of a 5 lane, rural typical roadway section (See Figure 3). This has many benefits:

- Early preservation of right of way reduces potential for expensive acquisition in the future.
- Increases construction set-backs, thus improving visibility along the corridor
- Provides adequate space for utilities, pedestrian/bicycle facilities, and landscape treatments

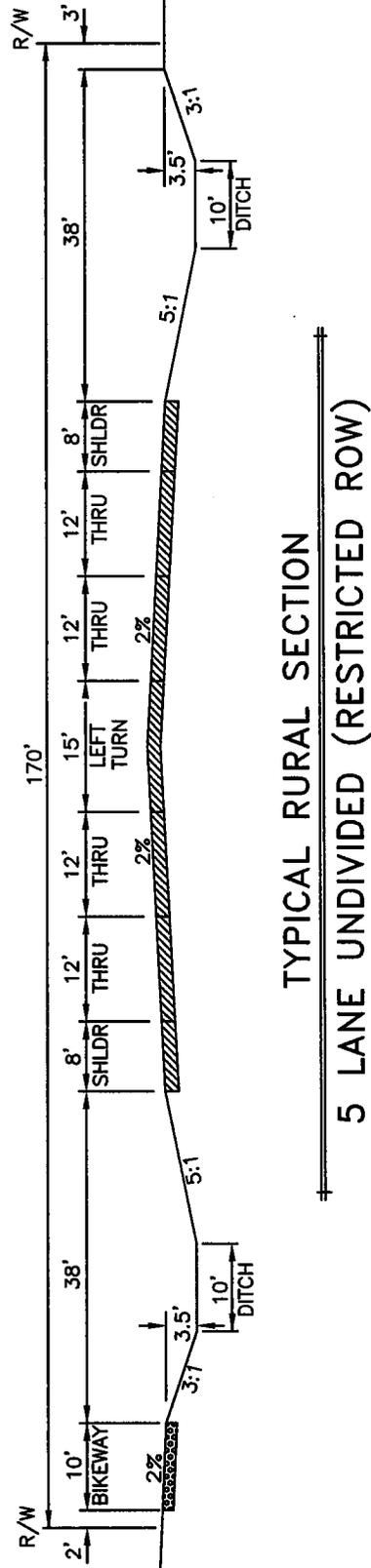
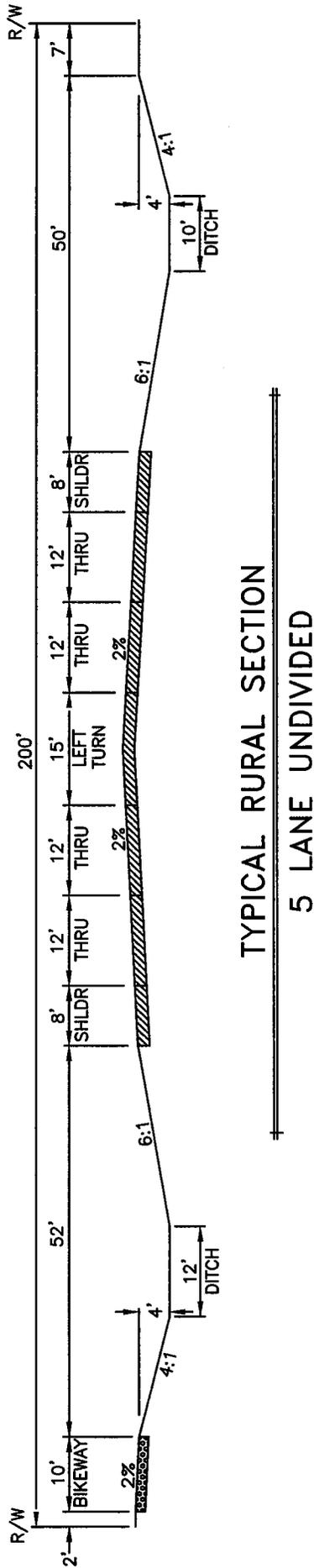


TYPICAL RURAL SECTION
3 LANE UNDIVIDED



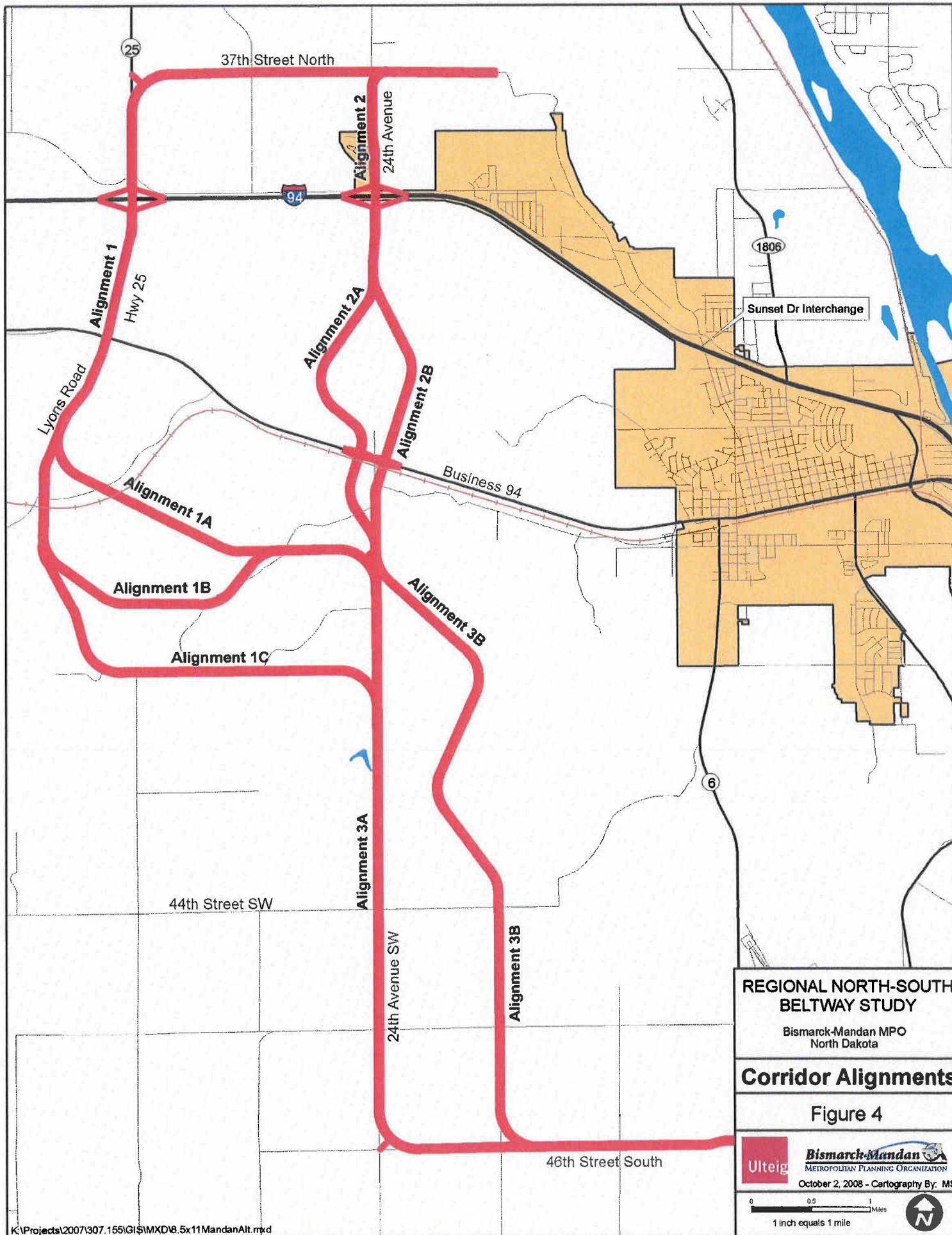
TYPICAL RURAL SECTION
3 LANE UNDIVIDED (RESTRICTED ROW)

REGIONAL NORTH-SOUTH BELTWAY STUDY Bismarck-Mandan MPO North Dakota
3-Lane Rural Section - Undivided
Figure 2
Ulteig



REGIONAL NORTH-SOUTH BELTWAY STUDY
Bismarck-Mandan MPO North Dakota
5-Lane Rural Section - Undivided

Figure 3

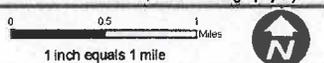


**REGIONAL NORTH-SOUTH
BELTWAY STUDY**
Bismarck-Mandan MPO
North Dakota

Corridor Alignments

Figure 4

Ulteig 
Bismarck-Mandan
METROPOLITAN PLANNING ORGANIZATION
October 2, 2008 - Cartography By: MS



C. Refine and Compare Corridor Alignments

As the study progressed, detailed analysis was conducted and adjustments to the alignments were made. Alternatives for the north, west and south ends of the beltway were identified (see Figure 4 on previous page). These alternatives are described and compared in the following paragraphs:

1. North Side Alternatives

Alternatives for a beltway corridor on the north side of Mandan included only the 37th Street corridor. As was stated earlier in the Report, the 37th Street corridor was chosen as the northern beltway because it is a section line road, it has limited development, and it provides a direct connection to one of the Northern Bridge Corridor alignments. Through the first two public input meetings, no comments were received in opposition to this corridor as the north beltway.

2. West Side Alternatives

Alternatives for a beltway corridor on the west side of Mandan included multiple alignments along the ND Highway 25 and 24th Avenue corridors. These alignments are shown in and are discussed in the following paragraphs.

a) Alignment #1

Alignment #1 follows the existing ND Highway 25 corridor alignment. The existing profile (grades) for Alignment #1 is found in Figures P1 and P2 of Appendix M-3. Since it is already available to travelers and has an interchange on I-94, it is assumed that for the next several years, this alignment will serve the community as the Western Beltway north of Business 94.

South of Business 94, no connection is available to bring traffic from ND Highway 25 east to ND Highway 6. Therefore, it is assumed that for the next several years, the Western Beltway will also use the Business 94 and ND Highway 6 corridors.

Eventually, connection of the ND Highway 25 corridor to the south and east of the railroad and Heart River will be desirable. It is debatable whether such a connection would be made as part of the beltway system or to serve other area development and traffic circulation needs.

Alternative extensions of ND Highway 25 across the railroad and Heart River were examined. These extensions, identified as Alignments 1A, 1B and 1C are discussed in the following paragraphs.

b) Alignment 1A

Alignment 1A provides the northerly option for an extension of ND Highway 25 across the Heart River and railroad. The profile (grades) for this alignment alternative is shown in Figure P1 of Appendix M-3.

Alignment 1A provides the shortest and most direct connection to the proposed 24th Avenue corridor. Ultimate costs, assuming any crossing along the railroad becomes grade separated, would be comparable with other options.

c) Alignment 1B

Alignments 1B and 1C cross the railroad tracks a short distance from the existing ND Highway 25 extension (Lyons Road) at-grade railroad crossing. These alternatives were originally developed with the assumption that the existing railroad crossing could be relocated to serve both current destinations further south along Lyons Road and future destinations across the Heart River. However, we understand now that relocation of an existing crossing is unlikely. The profile (grades) for this alternative is shown in Figures P3 and P4 of Appendix M-3.

Generally speaking, Alignment 1B appears to have the best profile (grades) of the studied Alignment 1 alternatives.

d) Alignment 1C

Alignment 1C was prepared with assumptions similar to Alignment 1B. The primary difference was that Alignment 1C makes better use of section lines and may be more conducive to right of way acquisition efforts. The profile (grades) for this alternative is shown in Figures P5 and P6 of Appendix M-3.

e) Alignment 2

Alignment 2 includes development of the 24th Avenue corridor from 37th Street North to the south side of I-94. Challenges with this alignment include access to Roughrider Subdivision and development of an interchange on I-94.

In order to reduce traffic impacts on Roughrider Subdivision and control local access to the beltway, the alignment is offset east from the section line by 60 feet. The existing roadway would be converted to a frontage road and access would be allowed at specific locations.

The existing I-94 frontage road (Old Red Trail) would be relocated further north to provide separation from the proposed interchange. Conflicts with the existing sewage lagoons should be eliminated once City sanitary sewer services are available to this area. The profile (grades) for this alternative is shown in Figures P7 and P8 of Appendix M-3.

(1) Interchange Considerations

This corridor study has identified the right of way that would be needed to accommodate an interchange at the intersection of I-94 and 24th Avenue. Although a variety of interchange configurations are feasible at this location, a diamond interchange ramp configuration is most conducive to handling the turning movements that are projected.

f) Alignment 2A

Alignment 2A provides a westerly alignment for the extension of 24th Avenue across the Heart River, Business 94 and the railroad tracks. The curvilinear alignment attempts to minimize grades coming off the bluff down to the Heart River. It also provides separation from an existing home and aligns the beltway perpendicular to the Heart River, Business 94 and the railroad tracks.

Alignments 2A and 2B assume that Business 94 will be elevated in order to facilitate development of a grade separated railroad crossing. The profile (grades) for this alternative is shown in Figure P7 of Appendix M-3.

g) Alignment 2B

Alignment 2B provides an easterly alignment for the extension of 24th Avenue across the Heart River, Business 94 and the railroad tracks. The profile (grades) for this alternative is shown in Figure P9 of Appendix M-2. The gradeline for this alternative is steeper than for Alignment 2A, however, it is a more direct route.

h) Alignment 3A

Alignment 3A provides an alignment for the extension of 24th Avenue from the end of either Alignment 2A or 2B south along the section line to connect with 46th Street South. The profile (grades) for this alternative is shown in Figures P10 and P11 of Appendix M-3. This alignment was considered because it was the most direct route, it would probably be easiest to implement from the right of way acquisition standpoint, and differences in vertical profile (grades) compared with other alignment possibilities were inconclusive.

i) Alignment 3B

Alignment 3B provides an alternative alignment for the extension of 24th Avenue from the end of either Alignment 2A or 2B south to connect with 46th Street South. It would be possible for Alignment 3B to connect with Alignment 1C, though this was not specifically evaluated. The profile (grades) for this alternative is shown in Figures P12 and P13 of Appendix M-3.

The curvilinear alignment minimizes profile (grades) grades while following a generally southward route. It also uses the 23rd Avenue section line for the southerly two miles.

3. South Alternatives

Alternatives for a beltway corridor on the south side of Mandan included only the 46th Street corridor. As was stated earlier in the Report, the 46th Street corridor was chosen as the southern beltway because it is a section line road, it has limited development, and it provides a direct connection to ND Highway 6 and a southern bridge corridor alignment identified in the LRTP. Through the three public input meetings, no comments were received in opposition to this corridor as the southern beltway.

D. Beltway Route Comparison Map and Matrix

The map on the next page (Figure 5) provides a comparison of the quantifiable criteria used to evaluate and compare beltway route alternatives: The following matrix was prepared to summarize some of the key criteria used to evaluate beltway route alternatives.

MORTON COUNTY BELTWAY ROUTE COMPARISON MATRIX				
EVALUATION CRITERIA	WEST LEG		NORTH LEG	SOUTH LEG
	24 th Avenue	ND #25 / 24 th Avenue	37 th Street	46 th Street
Cost / Environmental				
Waterway Crossings	No Difference		Route	Route
Flooding	No Difference			
LF of Wetlands Crossed	✓			
LF of Floodplain Crossed		✓		
Existing Ground Profile	✓			
Operational				
Feasible Posted Speed Limit	No Difference		No Alternative	No Alternative
Number of Access Points	✓			
Early Development Opportunities	✓			
Existing Interchange @ I-94		✓		
Addresses Desirable Interchange Spacing	✓	X		
Location for Future Railroad Overpass	✓	X		
Traffic Relief from Sunset Drive & 1806	✓			
Slope Stability Issues		✓		

KEY

✓ = Better Alternative

X = Fatal Flaw

Recommended Alignment Alternatives: 37th Street, 24th Avenue & 46th Street

VI. Local Coordination and Public Involvement

Significant efforts were made to enhance the opportunities for individuals to learn about this study and become involved. These efforts included development of a project website, thousands of direct mailings to landowners located in the project vicinity, public meetings and numerous individual conversations, and coverage by local media.

Local coordination and public involvement for this study was undertaken with three key stakeholder groups in mind: Transportation Facility Users and Adjacent Landowners, Policy Makers and Technical Staff.

A. Transportation Facility Users and Adjacent Landowners

Transportation facility users and adjacent landowners were encouraged to participate in the Study through the public meetings and the project website. Phone conversations were held with individuals who had questions or comments beyond items covered in the public venue.

1. Public Input Meeting #1

The first public input meeting in Mandan was held on November 22, 2007. It was jointly held with the 71st Avenue/Centennial Road Corridor Study. There were 150 letters mailed prior to the meeting to adjacent landowners and interested persons. Approximately 46 people attended the meeting.

The purpose of this meeting was to introduce study objectives and to seek early input on the full range of alternatives that should be considered by the study. Information from the meeting is provided in Appendix 5.

2. Public Input Meeting 2

The second public meeting in Mandan was held on July 16, 2008. There were 150 letters mailed prior to the meeting to adjacent landowners and interested persons. Approximately 42 people attended the meeting.

The purpose of the second public input meeting was to review the public input received from the first public input meeting, present the analysis conducted on the full range of alternatives, and receive feedback on preliminary alternative selection, issues and impacts. Information from the meeting is provided in Appendix 5.

3. Public Input Meeting 3

The third public input meeting in Mandan is tentatively scheduled for December 2008. 150 letters were mailed prior to the meeting to adjacent landowners and interested persons. Approximately 27 people attended the meeting.

The purpose of the third public input meeting was to present the draft Report and receive public input on Study recommendations. Information from that meeting is provided in Appendix 5.

B. Policy Makers

Policy makers include individuals who serve on the Morton County and City of Mandan Planning Commissions and Governing Bodies. These persons were notified of the public meetings and project website through a Newsletter.

This Newsletter provided additional information intended to keep our policy makers informed of the Study's progress, initial results and things they should be aware of. Additionally, Ulteig staff appeared before the governing bodies on three occasions prior to the Plan's adoption meetings. These personal appearances were intended to provide additional opportunity for local officials to ask questions and understand the direction and results of the Study.

The overall intent of the additional efforts to coordinate with local policy makers was to receive interim guidance from them on project activities and to position them for important decisions they would need to make later in the Study process.

C. Technical Staff

Technical staff representing Burleigh and Morton Counties, and the Cities of Bismarck, Lincoln and Mandan, as well as the MPO and NDDOT served on a Steering Committee for this Study. The Committee's role was to guide the direction of the study, to review study progress and provide input on alternatives and analysis. Further, they were asked to assist in refining the alternatives and in development of recommendations.

The Steering Committee met on 5 occasions to discuss the study's progress and to provide direction on further efforts. Summaries of these meetings are included in Appendix 8.

VII. Responses to Public Input

This section of the Report lists some of the main questions and comments received from the general public. It also provides responses. While it is not an all inclusive list, it is intended to simplify the ability of decision makers and the general public to see how this Report addresses key issues and questions that were raised.

A. The beltway along the ND Highway 25 corridor should be moved further south.

Response: The beltway needs to be developed relatively close to the urban area in order to serve the purposes for which it is intended. These include traffic relief on parallel routes, availability to commuters and freight haulers, linkage with area or regional destinations, and system continuity.

A beltway located further out would have minimal traffic relief on parallel routes, would only serve commuters and freight haulers with destinations outside our urban area, would have limited linkage with area or regional destinations, and would do little to improve system continuity across localized transportation barriers.

B. It is too late to plan or build a beltway here.

Response: Planning is often undertaken when needs become more obvious. Sometimes, a delay in planning results in activities that could have been prevented or done differently. In the case of the beltway corridor, development activity that has occurred in recent years has an influence on how the beltway can be designed and on its overall function. It is the role of elected officials and future environmental documentation to ultimately decide whether or not the level of growth has prohibited development of the beltway.

The Fringe Area Road Master Plan calls for essentially every mile-line to be planned as an arterial roadway with attributes similar to those of a beltway. Therefore, under any scenario, the intent is for mile line roads to be planned as arterial roads to the degree that terrain allows their development.

The design for the beltway corridor is essentially no different than it would be if the corridor was not on the beltway system. The planned roadway would be just as wide and the anticipated levels and types of traffic would be just as high. The primary differences correspond to the placement of an interchange along I-94 and the proposed connections of the beltway to future northern and southern bridge corridors.

C. The beltway will impact residential property.

Response: Based on the public input received, placement of the beltway adjacent to residential property is currently considered to have more negative impacts than positive ones. Concerns have been raised regarding noise, safety, and other issues as well. Given the assumption that the City of Mandan will continue to grow, the impacts of a "Do Nothing" alternative would eventually far outweigh the impacts of implementing a plan to develop the beltway.

VIII. Alternatives Selection and Recommendations

Implementation of improvements along the 24th Avenue corridor is a major infrastructure investment that will take many years to implement. Given the anticipated long timeline, it is critical that identified corridors be preserved and that a phased approach to implementation is established.

It is anticipated that through the Year 2030, a 2 lane, rural corridor with turn lanes will provide ample traffic capacity in most locations. A possible exception to this is the vicinity of the future interchange at I-94. And while for many years most of the corridors should require no more than a 2 lane facility with turn lanes, it is recommended that right of way preservation account for an ultimate 5 lane roadway facility.

A. Corridor Alignment Preferences

Multiple alignment locations have been identified as potential locations for the beltway. While some preferences have arisen regarding corridor selection; social and environmental issues, as well as development preferences may outweigh the technical differences between corridor alignments.

Extension of ND Highway 25 (Alignments 1 and 1B) shows promise as a potential future arterial corridor in Morton County. However, the Steering Committee did not believe the corridor was suitable as an interim or long range beltway facility. The route that includes 37th Street North, Highway 25, Business 94 and ND Highway 6 was seen as a viable beltway location to serve interim needs until the 24th Avenue corridor develops.

The long range corridor alignment preferences for the beltway include 37th Street North, 24th Avenue (Alignments 2, 2A or 2B, and 3A) and 46th Street South. It is noted that along the north side of the Heart River, soil stability and possible archaeological issues remain and would need to be addressed through further study efforts.

Long range beltway corridor development should be undertaken with the intent of promoting and responding to area development, and the relief of traffic congestion on Sunset Drive. Given that new development is already approaching the north end of the 24th Avenue corridor and that the north end of the corridor has the potential of providing traffic congestion relief, upcoming beltway development phases should concentrate on the 24th Avenue interchange and roadway connections to it.

Valid statements made by the public on the Burleigh County side of the Missouri River indicate that it is not too early to start planning for a second-tier beltway to handle longer commuter trips. If this is pursued, it is likely there will be implications in how this second-tier beltway would connect to roadway facilities on the Morton County side of the River. This planning should begin at the LRTP level and continue with future corridor planning efforts over time.

B. Corridor Funding

Construction cost estimates for the preferred alternatives were not prepared given the anticipated long range implementation. Recommendations and are summarized as follows:

1. Short Term Recommendations (Within 5 Years)

Short term improvements may be needed and will depend on activity by developers. Any short term improvements that are made should be consistent with the alternatives developed in this Report.

2. Mid Term Recommendations (6-10 Years)

Mid term improvements are anticipated to focus on the transportation corridor improvements that will need to be in place to support development and the eventual construction of a 24th Avenue interchange. Most likely, these improvements will include:

- Upgrades to 37th Street
- Extension of a collector roadway along the south side of I-94 from the vicinity of 19th Street North toward the 24th Avenue/ND Highway 25 corridors

3. Long Term Recommendations (11-20+ Years)

Long term improvements are anticipated to include construction of the 24th Avenue interchange. These improvements will need to include improvements along 24th Avenue between 37th Street and a future east-west collector street along the south side of I-94. Other improvements along 37th Street North, 46th Street South and 24th Avenue not previously completed are also anticipated during the long term element of the Plan. Construction costs for these improvements are estimated at:

- 24th Avenue interchange and roadway connections - \$10.0 million

Funding for any improvements associated with the beltway are anticipated with Morton County as lead agency until such time that areas of the beltway are annexed into the City of Mandan. Once annexed, it is anticipated that the City of Mandan would assume a lead agency role.

IX. Corridor Implementation Action Plan

For this Corridor Study to achieve its intended purposes, it is important for local jurisdictions to understand their roles and to give them guidance on efforts they may undertake to advance project development. The following activities are recommended for the City of Mandan and Morton County to undertake:

A. Corridor Preservation

Efforts to preserve the beltway should be made as developments along the preferred corridor alignments are considered and approved. These efforts include preservation of adequate right of way and management of access along the corridor consistent with the alternatives that are selected.

In locations where alternative alignments exist, development activity may force final decisions on which alignment location is selected. Ideally, the City, County and MPO would conduct more detailed investigations of these alternatives as funding resources permit. Issues such as soil conditions, environmental impacts and other site conditions could be further evaluated so that final preferred alignments could be refined and selected.

B. Additional Studies

Additional studies may be needed to further resolve issues that remained at the end of this Study. Examples include:

1. Infrastructure Facilities Extension Study – This Study is needed to plan coordination of future development and infrastructure facilities along both sides of I-94 between Highland Road and ND Highway 25. It would set local governmental policy for infrastructure and development needed in advance of pursuing interchange justification.
2. Morton County Beltway Alignments Refinement Planning – This effort would include detailed engineering and environmental investigation of the Alignment Alternatives 2A and 2B identified in this study. The intent of this effort would be to further refine alignment locations and to select a single location for preservation.
3. I-94/24th Avenue South Interchange Corridor Study & Interchange Justification Report.
4. Class II or Class III Cultural Resource Inventory on preferred corridor alignments.

X. Project Decisions (See following pages)

**Bismarck-Mandan
Regional North South Beltway Corridor Study**

Bismarck-Lincoln-Burleigh County Regional Corridor Element

Project Decisions

1. Should the 71st Avenue North, 66th Street and 48th Avenue South corridors be preserved as part of a beltway type facility?

The preferred alignment based on a technical analysis of the study area and input from the study's Technical Committee for the "Beltway Facility" includes the 71st Avenue North, 66th Street and 48th Avenue South corridors. Other corridors considered were 84th Avenue North, 80th Street, and 62nd Avenue South. Local staff supports preservation of 71st Avenue North, 66th Street and 48th Avenue South as part of a beltway type facility.

Yes X No _____

2. Should the beltway designation be eliminated in reference to these corridors?

After talking with interested Burleigh County land owners it is obvious that "not" referring to our beltway corridors as "beltway corridor" would go a long ways to appeasing their concerns (dissatisfaction). This is seemingly an easy and pain free fix. The road characteristics (ROW & speed limit) are the same for both an arterial and beltway corridor. However, for a short term gain (less public dissention), are we doing a disservice to future land purchasers by not referring to it as a beltway corridor? How else would they find out a street was planned as a future beltway corridor? Local staff supports maintaining the beltway name in future references to these corridors.

Yes _____ No X

3. Should City of Bismarck and Burleigh County staff work with land owners and developers to implement a diagonal connection between 66th Street and 71st Avenue North?

The diagonal connection does not follow established section lines or property lines and no right of way currently exists for this alignment. It was proposed because it provides a limited access connection between the two corridors while avoiding existing homes. Some current landowners have expressed opposition because the new corridor would bisect their property and impact how the area develops. Others are concerned that it places the corridor closer to their homes than was evident from the original alignment. Still, others living near the intersection have expressed support. Local staff supports this alignment and desires Commission direction to pursue further discussions with landowners and developers toward implementation.

Yes X No _____

4. Should right of way be preserved for an I-94 interchange at 66th Street?

Alternatives that slide the I-94 interchange alignment to the east or west of 66th Street were prepared to reduce or eliminate impacts to an existing residence and to avoid expensive relocation (costs estimated at \$500,000-\$750,000) of a communications tower. While sliding the alignment east or west does reduce impacts near the section line, it creates new impacts to a farmstead further east, or to the landfill further west. Local staff supports a preliminary selection of the route located on the section line.

Yes, on the section line Yes, offset east _____ Yes, offset west _____ No _____

5. Should right of way be preserved for an interchange at US Highway 83 and 71st Avenue North?

The NDDOT has indicated they are opposed to an interchange at this location because it is not consistent with other types of traffic control common along the US Highway 83 corridor. In-state experience has indicated that a mix of interchanges and signalized intersections can result in traffic operational and safety issues.

Local staff recognizes that unless right of way for an interchange is preserved as this area develops the ability to construct an interchange at this location may be prohibitive. Further, an interchange may provide better long range traffic operations at this location than would a signalized intersection. Therefore, local staff supports preservation of an interchange at this location.

Yes No _____

Mandan-Morton County Regional Corridor Element

Project Decisions

6. Should the 24th Avenue corridor be preserved according to current City and County standards as the beltway (minor arterial) route?

Local staff supports preservation of the 24th Avenue corridor as the preferred location for the beltway. In the interim, Highway 25, Business 94 and ND Highway 6 would serve as beltway routes on the west side of Mandan.

Yes No _____

7. Should right of way be preserved for an I-94 interchange at 24th Avenue?

Local staff supports preservation of an I-94 interchange at 24th Avenue. While other locations were considered, this location is ideal for interchange spacing between existing interchanges.

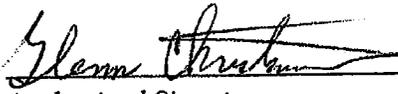
Yes No _____

8. Should the beltway designation be eliminated in reference to these corridors?

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Yes _____ No X

The Bismarck-Mandan Metropolitan Planning Organization Policy Board, at their May 19, 2009 meeting hereby approved these project decisions and approved the final Bismarck-Mandan Regional North-South Beltway Corridor Study report.



Authorized Signature
Bismarck-Mandan MPO

6-4-09
Date

**Bismarck-Mandan
Regional North South Beltway Corridor Study**

Mandan-Morton County Regional Corridor Element

Project Decisions

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Local staff supports preservation of the 24th Avenue corridor as the preferred location for the beltway. In the interim, Highway 25, Business 94 and ND Highway 6 would serve as beltway routes on the west side of Mandan.

Yes X No _____

2. Should right of way be preserved for an I-94 interchange at 24th Avenue?

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Yes X No _____

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Yes _____ No X

Comments:

James Newbauer
Authorized Signature

4-21-2009
Date

**Bismarck-Mandan
Regional North South Beltway Corridor Study**

Mandan-Morton County Regional Corridor Element

Project Decisions

1. Should the 24th Avenue corridor be preserved according to current City and County standards as the beltway (minor arterial) route?

Local staff supports preservation of the 24th Avenue corridor as the preferred location for the beltway. In the interim, Highway 25, Business 94 and ND Highway 6 would serve as beltway routes on the west side of Mandan.

Yes No

2. Should right of way be preserved for an I-94 interchange at 24th Avenue?

Local staff supports preservation of an I-94 interchange at 24th Avenue. While other locations were considered, this location is ideal for interchange spacing between existing interchanges.

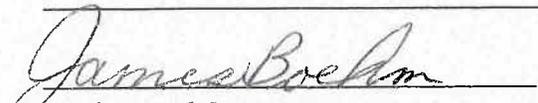
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Yes No

Comments:


Authorized Signature
Chairman Morton County Comm

5-12-2009
Date