SECTION 2.0
ALTERNATIVES

2.1 Introduction

This section describes the alternatives that meet the purpose and need to improve safety, enhance system performance, and improve system continuity. Alternatives that enhance system performance, improve system continuity, and address safety problems resulting from roadway deficiencies, frequent turning movements, a higher percentage of truck traffic, and an aging driver population, were subjected to a detailed study. It also includes a discussion of the alternatives, which did not satisfy the Purpose and Need that were eliminated from the detailed study.

2.2 Development of the Range of Alternatives

Several methods were used to develop the range of alternatives. These methods included: 1) requests for oral and written comments at public informational meetings; 2) early consultation with local, state, and federal agencies; 3) formal requests for comments from agencies and interested parties through NDDOT's solicitation of views process; 4) through the scoping process; 5) by a web site (http://www.houstoneng.com/projects/ushwy2/index.html); and 6) by direct e-mail.

An initial list of possible alternatives was developed in January 2000 during early public informational meetings in Williston, Stanley, and Minot. Some of these same alternatives had been described in previous environmental documents. Suggestions on other alternatives were discussed during the informational and scoping meetings. Some of the new alternatives were non-transportation related and consist of investments in technology (e.g., high-speed Internet backbone) or directly into economic development rather than in the highway itself. Non-highway transportation alternatives also included rail, air, or some rail-air combinations. Highway transportation alternatives are those alternatives directly related to improving truck and automobile transportation by highway construction.

Fifteen alternatives were submitted and considered. These are:

- No Action
- Information Technology Investment
- Direct Economic Development Investment
- Rail
- Air
- Multi-modal
- Improve US 52
- Super Two Design
- New Alignment
- Controlled Access Four-Lane
- No Action (Restoration, Rehabilitation, and Resurfacing [3R])
- South Alignment
- North Alignment
- Selective North-South Alignment (preferred)
- Complete Construction

Alternatives are presented and evaluated in these sections: 2.3 Alternatives Eliminated from Detailed Study, and 2.4 Reasonable Alternatives Subject to Detailed Study.

2.3 Alternatives Eliminated from Detailed Study

The following alternatives were eliminated from detailed study because they did not meet the criteria discussed in the Purpose and Need:

No-Action

Non-Transportation Alternatives:

- Information Technology Investment
- Economic Development Investment

Transportation-Related Alternatives:

- Rail/Air
- Multi-modal
- Improve US 52
- Super Two Design
- New Alignment
- Controlled Access Four-Lane Alternative

2.3.1 No-Action Alternative

This alternative would involve not action at all on US 2, including no routine maintenance. The National Environmental Policy Act requires that a no-action (sometimes called a no-build) alternative be advanced for detailed consideration in an EIS. The no action alternative advanced normally includes short-term minor restoration activities (such as maintenance improvements) that maintain continuing operation of the existing roadway. Therefore, a no-action alternative dubbed "No Action [Restoration, Rehabilitation, and Resurfacing (3R)]," which incorporates maintenance activities, was carried forward for detailed analysis. The No Action (3R) alternative discussion is located in Section 2.4.1.

2.3.2 Non-Transportation Alternatives

2.3.2.1 Information Technology Investment Alternative

Based upon the public comments received, the Information Technology Investment Alternative consists of using the funds for the proposed action to construct a broadband Internet backbone within the region served by US 2. This might be accomplished by laying new fiber optic cable. This would presumably allow the cities and residents along US 2 and within the northwest region the opportunity to boost the regional economy through e-commerce. E-commerce may include direct Internet sales, advertising, or webpage development and hosting.

2.3.2.2 Economic Development Investment Alternative

This alternative, as presented by the public during the scoping meetings, consists of using the funds for the proposed action as a direct investment into economic development. This may include encouraging businesses to relocate to the region either by providing financial incentives for relocation or through tax increment financing. It may also include additional advertising locally, regionally, or nationally, to increase tourism within the region.

Although the Information Technology Investment and Economic Development Investment Alternatives provide some degree of regional economic viability, they do not meet the purpose and need to increase safety, the condition of the roadway, or to enhance system performance. Funding for these alternatives is not readily available, since federal aid highway dollars cannot be used to fund these alternatives. Currently, there are a number of ongoing public/private initiatives working towards this type of development. The Information Technology Investment and the Economic Development Investment Alternatives were eliminated from additional detailed study because they fail to improve safety, enhance system performance, and improve system continuity.

2.3.3 Non-Highway Transportation Mode Alternatives

Alternatives involving improvements to transportation modes other than by trucks and automobiles, which are perceived as partially attaining regional economic viability, were suggested during the scoping meetings. These alternatives included:

2.3.3.1 Rail Alternative

The Rail Alternative consists of improving track speeds and access to businesses and merchants, which ship agricultural and other commodities

via rail. The alternative essentially consists of improving the transportation efficiency of the rail system, as a necessary link to the highway transportation system.

2.3.3.2 Air Alternative

The Air Alternative consists of improving accessibility and service to the regional airports in Williston and Minot. It may also include improved accessibility to local airports like Stanley. Improved accessibility includes improved transportation systems for the movement of people, goods, and products into and out of the region, primarily by providing a greater number of flights.

2.3.3.3 Multi-Modal Alternative

The Multi-modal Alternative would consist of improving both air and rail modes of transportation. This alternative essentially consists of improving the transportation efficiency of the combined rail and air system, as a link to the highway transportation system.

Although alternate modes may meet some of the components necessary to support local economic development initiatives, they fail to improve safety and improve system continuity. Just-in-time deliveries of goods, increased tourism, and access to basic services would not be addressed either. The rail alternative may provide for the movement of agricultural commodities and industrial materials, but does not provide just-in-time delivery and does not address safety improvements or the transportation component needed to move the commodities and industrial materials from the source or users to the railroad. Currently, city/industry partnerships are actively involved in pursuing multi-model facilities. The air alternative would likely be limited to Minot and Williston, both of which have commercial air service. The air alternative will not improve safety or improve system continuity.

While the various modes in this alternative may enhance system performance to some extent, they still require a highway facility to support the local economic development initiatives. Further, these alternatives are not capable of improving safety, improving system continuity, or improving the condition of the existing roadway. Therefore, they do not satisfy the purpose and need and were eliminated from additional detailed study.

2.3.4 Highway Transportation Alternatives

The remaining alternatives consist of some type of highway system improvement for truck and automotive transportation within the northwest region of the state.

2.3.4.1 Improve US 52 Alternative

US 52 extends north from US 2 just west of Minot to the Canadian border. The Improve US 52 Alternative consists of reconstructing US 52 either by widening the driving lanes and shoulders or by creating a divided four-lane highway. Improvements to US 52 are being developed by NDDOT and proceeding as a separate, ongoing action, from Kenmare to the junction of US 2. Construction began in the summer of 2002. Separate environmental review has been completed for that project. While improving US 52 will benefit the North Dakota transportation system, it will not improve safety, enhance system performance, or improve system continuity on US 2.

2.3.4.2 Super Two Alternative

In Response to comments received on the Draft Environmental Impact Statement, the discussion of this alternative has been enhanced to provide further detail explaining why a two-lane alternative, with passing lanes and other design features, was not carried forward for detailed consideration. This alternative has been dubbed “Super Two.” Ultimately, this alternative was not carried forward for detailed

consideration because, as explained below, it fails to meet the purpose and need of the project.

Typical Design Recommendations: The Super Two design shares many of the characteristics of a traditional two-lane highway but incorporates dedicated turning lanes and alternating passing lane. AASHTO Policy on Geometric Design of Highways and Streets does not contain specific guidance on Super Two design. Research on Super Two design features, used by other states, reveals the following recommended actions: No access allowed without turn lanes; center buffer; turn lanes for all permitted turns; passing lanes; horizontal and vertical curves with high-design speeds; adequate traffic-control system; passing lane length of 1.2-1.5 miles, spaced 3.8-4.5 miles on a rolling terrain with 2600 to 3200 ADT.

Alternate Details: The Super Two Alternative, as evaluated, consisted of adding alternating passing lanes and turn lanes to the existing roadway. Preliminary design identified the need for the addition of 30 passing lanes, 16 eastbound, and 14 westbound. Although typical Super Two design recommends turn lanes at all intersections, the plans evaluated for impacts only included turn lanes at 12 intersections.

Currently, there are approximately 500 locations where turning movements occur on this stretch of US 2. If turn lanes were included for all of them, a majority of the100-mile stretch would have a turning lane, passing lane, or both. Because these turning locations provide local access, elimination of more than just of few of them would have significant social and financial impacts to residences and farmers who must use them to access their homes or fields. For these reasons, auxiliary turn lanes were included at the 12 major intersections only. Beyond areas where passing or turning lanes were included, the roadway would consist

of two 12-foot wide lanes with 8-foot wide shoulders. Cross sections used for evaluation of the Super Two Alternative can be seen in Appendix Figures B-14 and B-15.

Lengths of the passing lanes throughout the project corridor vary depending on the terrain and geometric constraints. A map depicting passing-lane and turning-lane locations determined by preliminary design can be seen in Appendix Figures B-12 and B-13. The estimated cost for this alternative is $54 million.

Safety Issues: Safety issues addressed by the Super Two Alternative are: Turning movement conflicts will be reduced at 12 major intersections. Passing restrictions will be reduced on 22 percent of the roadway where a lane would be added. Intersections beyond or across the road from the passing lanes and beyond the 12 major intersections will not see any safety improvements. In the study segment, there are approximately 500 locations where county roads, missile access road, oil well roads, oil tank roads, farmstead approaches, or field approaches intersect the mainline. The Super Two Alternative would not improve the majority (over 78 percent) of these intersections. The difference in speeds created by the frequent use of these intersections and approaches by large (length and width) farm equipment, oil trucks, and military convoys will continue to create safety concerns.

Inclement weather is also another major safety concern with the Super Two Alternative. Frequently, during the winter months in North Dakota, pavement markings are covered with snow making it difficult for drivers to determine where lanes lines are and what color they are. Safety concerns arise because drivers could become confused about lane assignments and which lane has right of way to the passing lane. Signing for passing lanes, which are currently not used in North Dakota, would

need to be incorporated at each of the passing lanes including signs that mark no-passing zones.

Because of the problems experienced by many older drivers (see Section1.2.1), particularly those related to vision, they often have a hard time reading roadside signs. Because of that, studies have shown they often do not pay attention to roadside signs. Likewise, older drivers may find it difficult to discern the differences in pavement markings even with good visibility. Older drivers will find a non-typical roadway design, which includes alternating lane assignments where only pavement markings and signs designate lane assignments, more difficult to use.

The Super Two alternative introduces some additional safety concerns that the build alternatives advanced for detailed consideration do not. At the end of all the added passing lanes, traffic will have to transition back to two lanes. The military expressed a concern that as a vehicle passes one of their convoys and encounters one of the many transitions; the passing vehicle either will be forced to accelerate quickly to pass the convoy, slow down drastically to return to the position behind the convoy, or will be forced to cut into the convoy. As stated in the Purpose and Need Section, this is a security concern as well as a safety concern. The Minot Air Force Base has indicated that a Super Two design does not fully resolve any safety, efficiency, or security concerns set forth by a two-lane highway for their operations.

System Performance: The Super Two Alternative would provide some degree of improved performance to the roadway. System performance would be improved by the added lanes whenever through traffic encountering slower moving traffic does not have to slow down to wait for a passing opportunity. With this alternative, passing opportunities would not be assured in areas without the added lanes. System performance will

continue to be impacted whenever through traffic encounters slower-moving traffic, slow-moving farm equipment, slow-moving military convoys, or traffic turning into the many local access locations and having to reduce speed while waiting for a passing opportunity. Approximately 78 percent of the roadway would not have the added lanes, and the performance would remain the same as the current roadway.

System Reliability: Maintenance or construction on two-lane roadways and bridges often requires closing one or both lanes of traffic. When this occurs, traffic may be diverted to a detour or may have to stop and wait for a pilot car. Furthermore, traffic crashes can result in stopping traffic or road closures on two-lane roads. Road closings, interrupted travel, and detours make two-lane roads less reliable than four-lane roads.

NDDOT has determined that maintaining a high degree of reliability and mobility on the highways within the Interregional System is critical to the movement of people and goods on this system. The Super Two Alternate does not maintain a high degree of reliability.

NDDOT's Highway Performance Classification System includes the following requirements for Interregional System roads: Maintain average travel speeds of 60 to 65 miles per hour; demonstrate a high degree of safety; and have limited passing restrictions. Because the Super Two Alternative will not provide turn lanes at all intersections and will not have continuous passing lanes, traffic will have to reduce travel speed at these locations whenever the opposing lane is occupied.

System Continuity: System continuity is also a safety concern. North Dakota does not have a section of roadway using the Super Two, and this would be the only segment of its kind in the state. Most North Dakota drivers would not be familiar with this type of roadway.

NDDOT's Interregional System roads need to demonstrate a high degree of safety with crash rates below the statewide average. It is believed that the Super Two Alternative with its unique section, non-uniform operational requirements, and numerous transitions does not achieve the safety goals determined appropriate for this section of US 2.

Why Super Two was removed from further evaluation: The Super Two Alternative was not advanced for detailed consideration because it does not meet the purpose and need of the project. It does not adequately address safety concerns created by traffic moving at vastly different speeds, and it creates additional safety concerns associated with determining use of the passing lane under adverse weather conditions typical of North Dakota in the winter. Additionally, the presence of lengthy military convoys raises both safety and national security concerns when a passing vehicle is unable to pass the entire convoy before losing access to a passing lane.

The introduction of the Super Two highway configuration may lead to both safety and continuity concerns as drivers encounter an unfamiliar section of roadway because a Super Two configuration does not exist anywhere else in the state. Finally, the Super Two Alternative does not sufficiently enhance system performance to function properly as part of the Interregional System of roads under NDDOT's Highway Performance Classification System due to safety concerns, passing restrictions, and limits on travel speeds due to slow-moving vehicles.

2.3.4.3 New Alignment Alternative

Various potential routes on new alignments were considered for a new highway. The most likely New Alignment Alternative is to the south of existing US 2. One possible alignment would begin on a paved county road just south of Minot at the junction of US 83 (Figure 2-1). This route

would then extend to the west, passing south of Shell Lake, to near Belden. From Belden, the route would proceed to the northwest until connecting to the east-west segment of ND 1804 in Mountrail County, which then continues west to Williston. About 23 miles of this route is along paved county roads, about 38 miles would follow county gravel roads and/or new location, and about 49 miles would be along ND 1804.

Although this alternative potentially provides a shorter route between Minot and Williston, it bypasses the smaller communities along the existing US 2. These communities would lose connectivity with the regional economy to a certain extent, adversely affecting regional economic viability. Additionally, the New Alignment Alternative would result in a new roadways corridor across lands not previously disturbed by a roadway. Expectations are that a new alignment would actually traverse a greater number of previously undisturbed environmental and cultural features than the present US 2. Therefore, greater environmental impacts are likely. In addition, this alternative does not provide the same access to existing railroad facilities necessary for the movement of agricultural commodities.

This alternative was not advanced for detailed consideration because it fails to address safety concerns on the existing US 2, which would still need to be maintained in order to provide access to existing homes and businesses. It also fails to enhance system performance in a way that supports existing businesses and ongoing economic development initiatives because many of the businesses will be bypassed by the new alignment.

2.3.4.4 Controlled Access Four-Lane Alternative

The Controlled Access Four-Lane Alternative requires controlling access by constructing interchanges along existing US 2 and constructing an

additional roadway to provide a four-lane divided highway. The alternative also requires the construction of frontage roads and the realignment of many local roads and intersections. This alternative would decrease accessibility to US 2 locally, because access would only be provided at interchanges. This would, in effect, separate farms from fields, resulting in greater social impact. Additionally, there are much higher construction costs and environmental impacts associated with frontage road and interchange construction. Therefore, because of the anticipated social impacts, greater environmental impacts, and greater construction cost, the Controlled Access Four-Lane Alternative was eliminated from further detailed study.

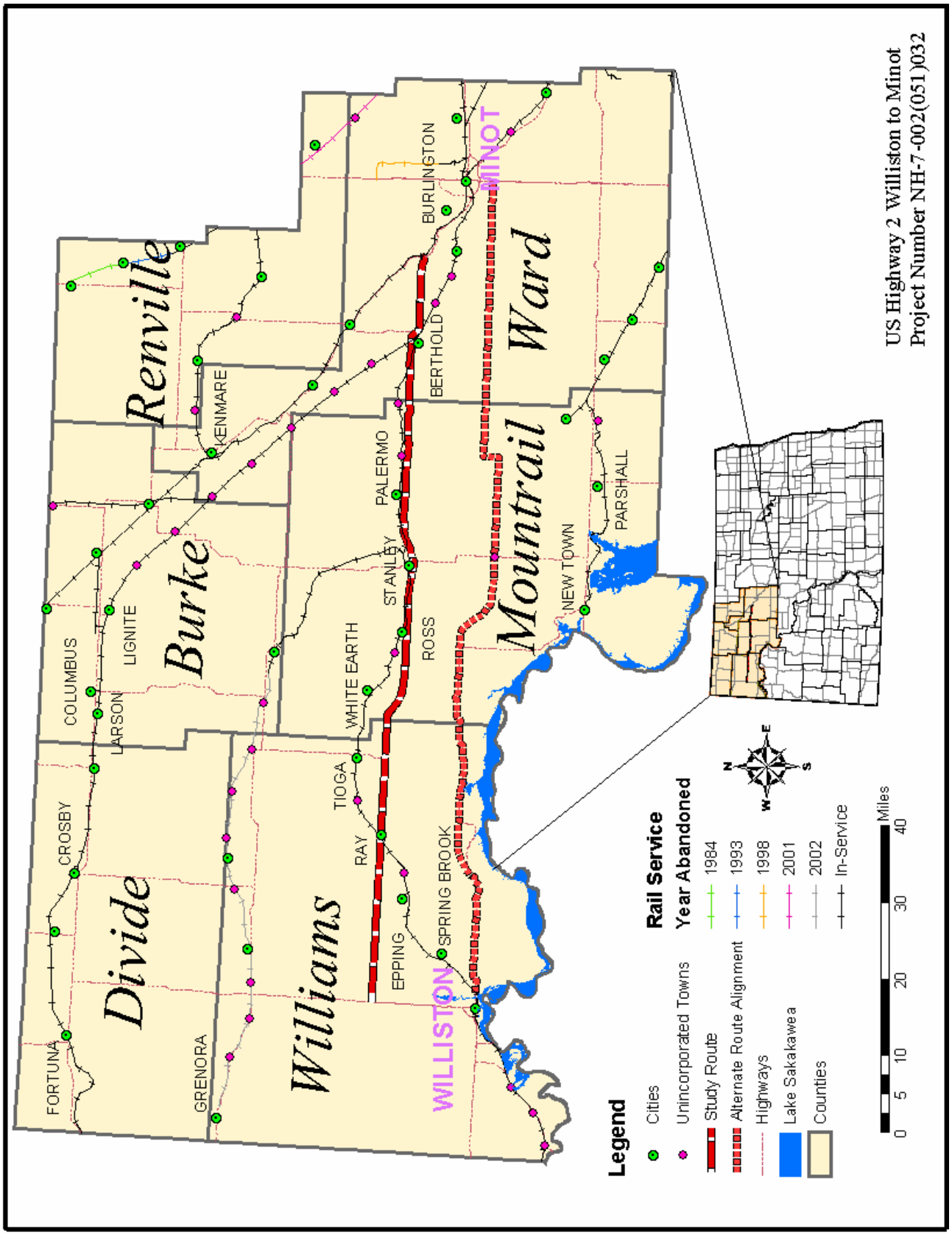
2.4 Reasonable Alternatives Subject to Detailed Study

Five alternatives, including four build alternatives and the No-Action Alternative, were subject to detailed study. Three of the build alternatives were developed to consider the use of the existing roadway as two lanes (i.e., a roadway) of the divided four-lane highway. The four build alternatives meeting the purpose and need were considered reasonable. These alternatives included the:

- South Alignment Alternative;
- North Alignment Alternative;
- Selective North-South Alignment Alternative (preferred);
- Complete Reconstruction Alternative.

Additional ROW was previously acquired to accommodate the additional roadway on the south side of the existing roadway, from near Ray to about four miles west of Berthold. Although this ROW was reserved for the new roadway, the North Alignment and Selective North-South Alignment (preferred) Alternatives were developed to evaluate impacts associated with other alignments. The reserved ROW did not influence the alternative selected.

Figure 2-1 – Alternative Route Alignment



All reasonable alternatives were considered. A decision about the preferred alternative was made after considering comments on the Draft EIS (DEIS) and from the public hearings. A description of the No-Action Alternative and each of the build alternatives follows.

2.4.1 No-Action (Restoration, Rehabilitation, and Restoration [3R]) Alternative

The No-Action Alternative would maintain US 2 as a two-lane highway as it exists today. The improvements would be limited to resurfacing type of activities consisting of bituminous overlays and pavement repairs that extend the service life of the highway by providing additional structural capacity.

Portions of US 2 within the study segment were reconstructed or received a bituminous overlay during the mid to late 1990s. An exception is the segment of US 2 extending from US 85 to Ray (milepost 32.4 to 53.3). It is anticipated that this segment would require a bituminous overlay or a mill and bituminous overlay. The existing roadway width in this segment is generally 40 feet and is sufficient for a bituminous overlay. Safety improvements such as slope flattening were previously completed over the full length of the project.

2.4.2 South Alignment Alternative

The South Alignment Alternative consists of providing a divided four-lane highway by constructing a new roadway (two-lane with a 70-mph design speed) south of and parallel to the existing roadway. The proposed typical section for the rural areas is shown in Figure 2-2. The south roadway centerline is offset 104 feet from the centerline of the existing roadway. Paved shoulders, with a width of four feet on the inside next to the median and ten feet on the outside of each roadway (new and existing), are proposed. Shoulder inslopes are designed at a 6:1 (horizontal: vertical) grade.

Two missile silos (approximate mileposts 84.86 and 121.28) potentially affect the alignment of the new roadway for the South Alignment Alternative. The US Air Force requested a minimum access road distance of 150 feet, measured from the edge of the new roadway shoulder to the boundary fence line. The South Alignment Alternative meets this offset requirement at both missile silo locations.

Just west of Ray, the alignment of the south roadway transitions toward the existing roadway to meet the existing urban undivided four-lane section (with a common left-turn lane) through the City (Figure B-2 in appendices). The alignment of the new roadway then transitions back to the south to the typical rural section, once through the city of Ray. The existing typical five-lane sections through the city of Ray (approximate mileposts 52.88 to 54.20) are shown in Figure 2-3.

The typical section through the White Earth River Valley (approximate MP 71 to MP 76) was modified to a 54-foot centerline-to-centerline distance to avoid and minimize impacts to wetlands and cultural resources. Impacts for all build alternatives were adjusted from the DEIS to reflect this modification.

The existing roadway through Ross is already located along the south side of the city, south of most houses, buildings, and businesses. Therefore, the new roadway would be constructed south of the existing roadway. This alignment also fully uses the existing 350 feet of ROW within Ross. The proposed typical section through the city of Ross (approximate milepost 81.92 to 83.59) is the same as the rural section shown in Figure 2-2.

The alignment of the south roadway transitions toward the existing roadway to meet the present section at Stanley (Figure B-4 in appendices). This section is a divided four-lane highway with an 84-foot centerline-to-centerline distance. The existing typical section through the city of Stanley (approximate milepost 89.26 to

91.29) is shown in Figure 2-4. The new roadway transitions back to a 104-foot centerline-to-centerline distance east of Stanley.

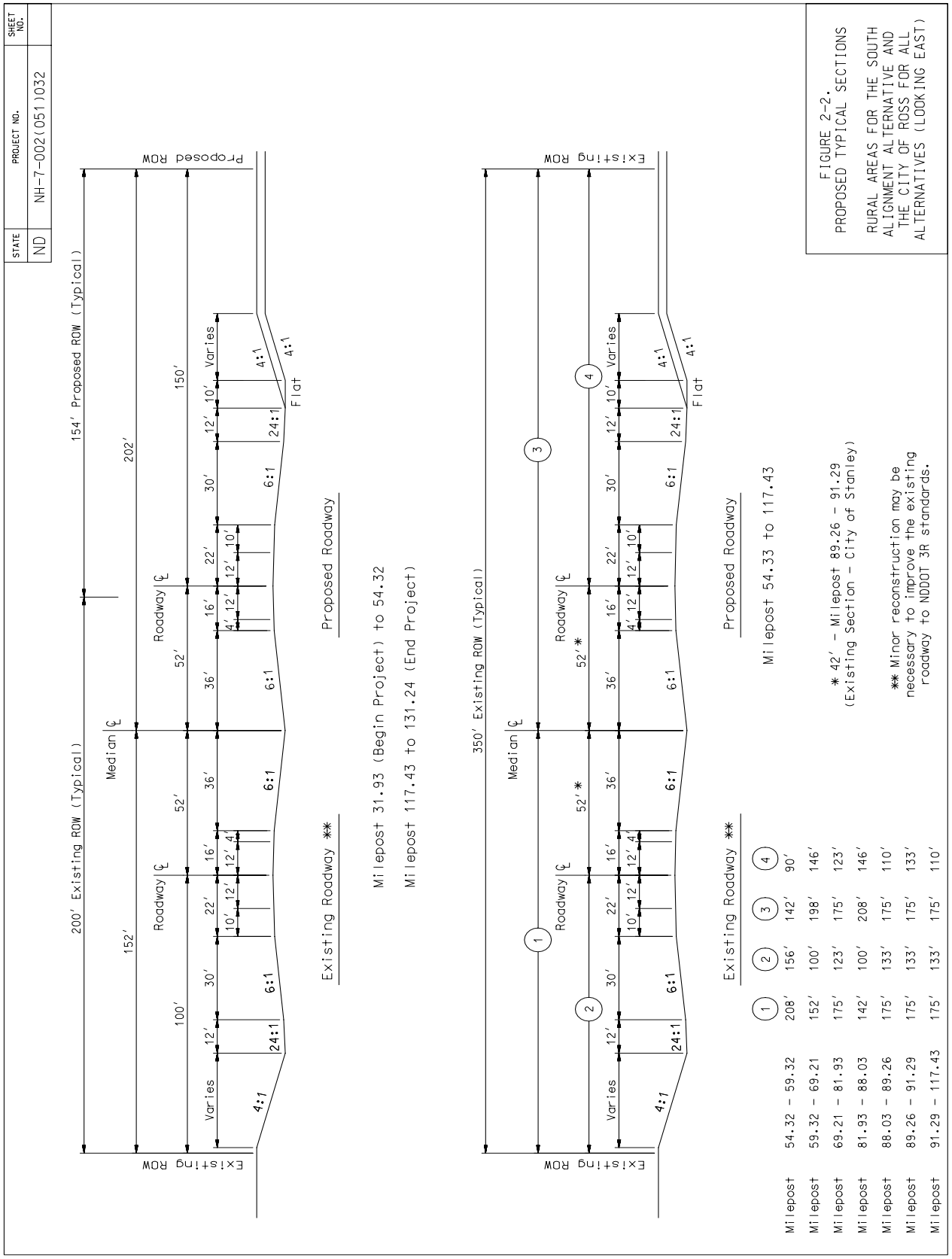
The new roadway is proposed north of the existing roadway through Berthold to avoid industrial facilities, businesses, and school property (Figure B-3 in appendices). One house located north of the existing roadway will be less than 41 feet from the outside shoulder of the new roadway. The impact analysis assumes this house will be relocated.

The new roadway transitions from the south side to the north side of the existing roadway six miles west of Berthold (approximate milepost 114.8). The new roadway transitions back to the south side of the existing roadway near the horizontal curve at the eastern limits of Berthold (approximate milepost 123.81). This avoids a salvage yard business east of Berthold, located on the north side of the existing roadway (Figure B-3 and B-5 in appendices). The transitions will require partial reconstruction of the existing roadway to accomplish the realignment.

A rural typical section is proposed through Berthold, with the new roadway located on the north side of the existing roadway (Figure 2-5). Impact analysis was revised from the DEIS and is now based on using an 84-foot centerline-to-centerline rural section as exists in Stanley.

The existing ROW width for the rural areas west of Ray and from nearly four miles west of Berthold to the east (milepost 31.93 to 54.32 and milepost 117.43 to 131.24) is typically 200 feet. Therefore, an estimated 154 feet of new ROW needs to be purchased measuring from the existing south ROW boundary. The existing ROW width for the rural areas east of Ray to four miles west of Berthold (milepost 54.32 to 117.43) is typically 350 feet. The centerline of the existing roadway is generally offset to the north within this ROW. Through these areas, the new roadway would be constructed within the existing ROW.

Figure 2-2. Proposed Typical Sections



The need for additional permanent ROW is not anticipated within the cities of Ray, Ross, and Stanley. The existing ROW width through Berthold is typically 200 feet, therefore, an estimated 134 feet of new ROW needs to be purchased measuring from the existing north ROW boundary.

2.4.3 North Alignment Alternative

The North Alignment Alternative consists of providing a divided four-lane highway by constructing a new roadway (two-lane with 70-mph design speed) north of and parallel to the existing roadway. The proposed typical section for the rural areas is shown in Figure 2-5.

The north roadway centerline is offset 104 feet from the centerline of the existing roadway. Paved shoulders, with a width of four feet on the inside next to the median and ten feet on the outside of each roadway (new and existing), are proposed. Shoulder inslopes are designed at a 6:1 (horizontal: vertical) grade.

Just west of Ray, the alignment of the north roadway transitions toward the existing roadway to meet the existing urban undivided four-lane section (with a common left-turn lane) through the city. The alignment of the new roadway then transitions back to the north to the typical rural section once through the city of Ray. The existing typical five-lane sections through the city of Ray (approximate mileposts 52.88 to 54.20) are shown in Figure 2-3.

The typical section through the White Earth River Valley (approximate MP 71 to MP 76) was modified from a 104-foot centerline-to-centerline to a 54-foot centerline-to-centerline distance to avoid and to minimize impacts to wetlands and cultural resources. Impacts for all build alternatives were adjusted from the DEIS to reflect this modification.

Figure 2-3. Existing Typical Sections through the City of Ray

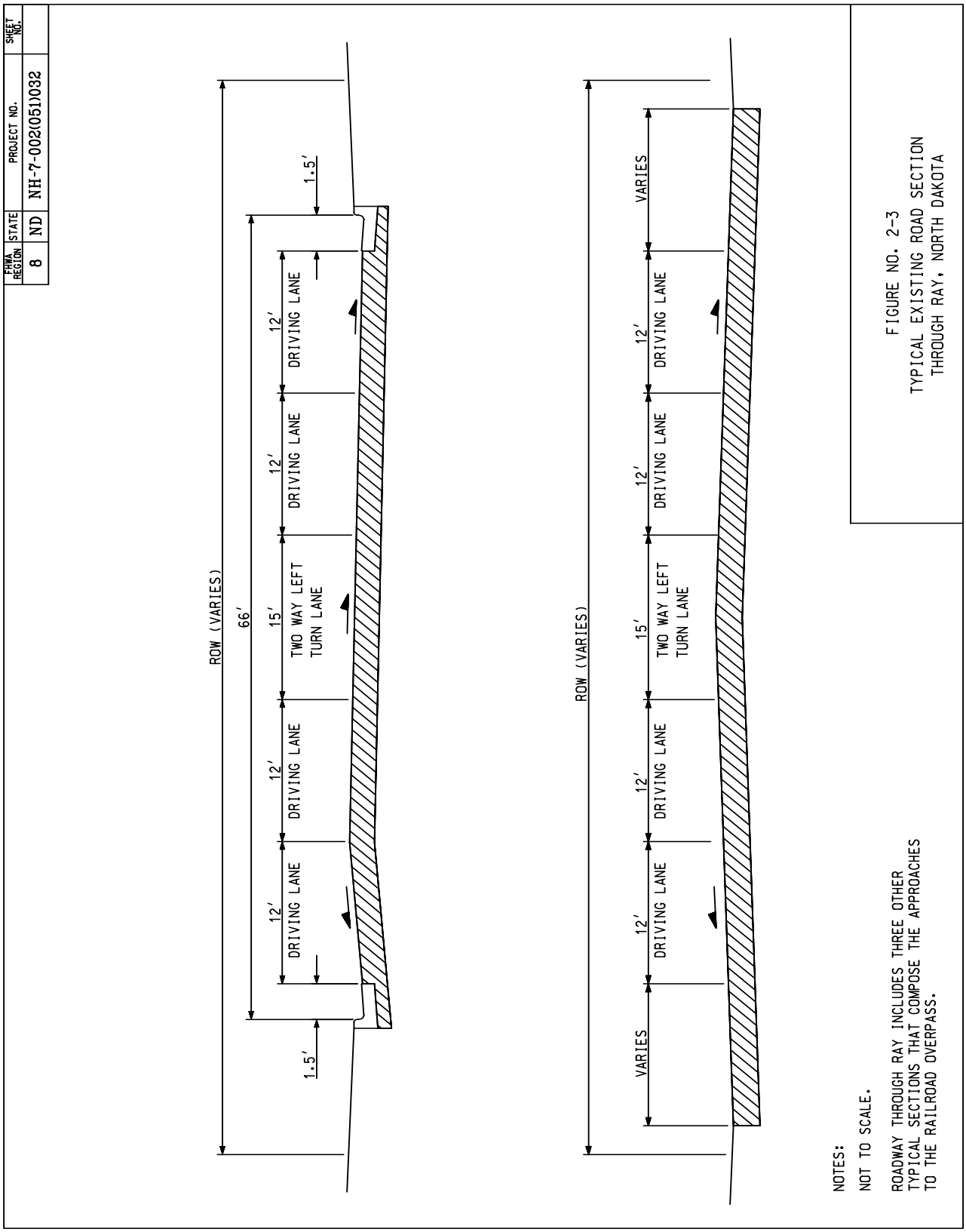
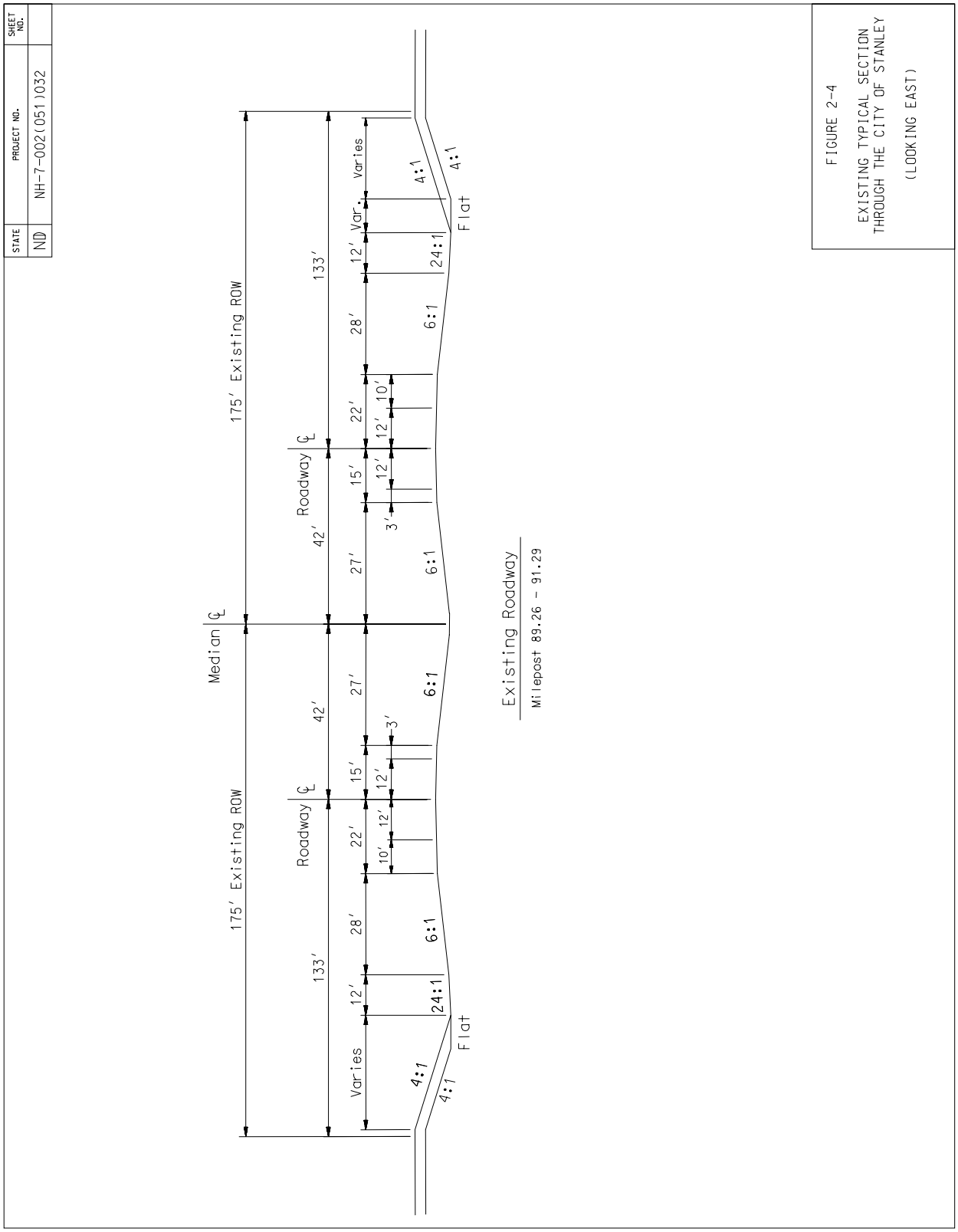


Figure 2-4. Existing Typical Sections through the City of Stanley



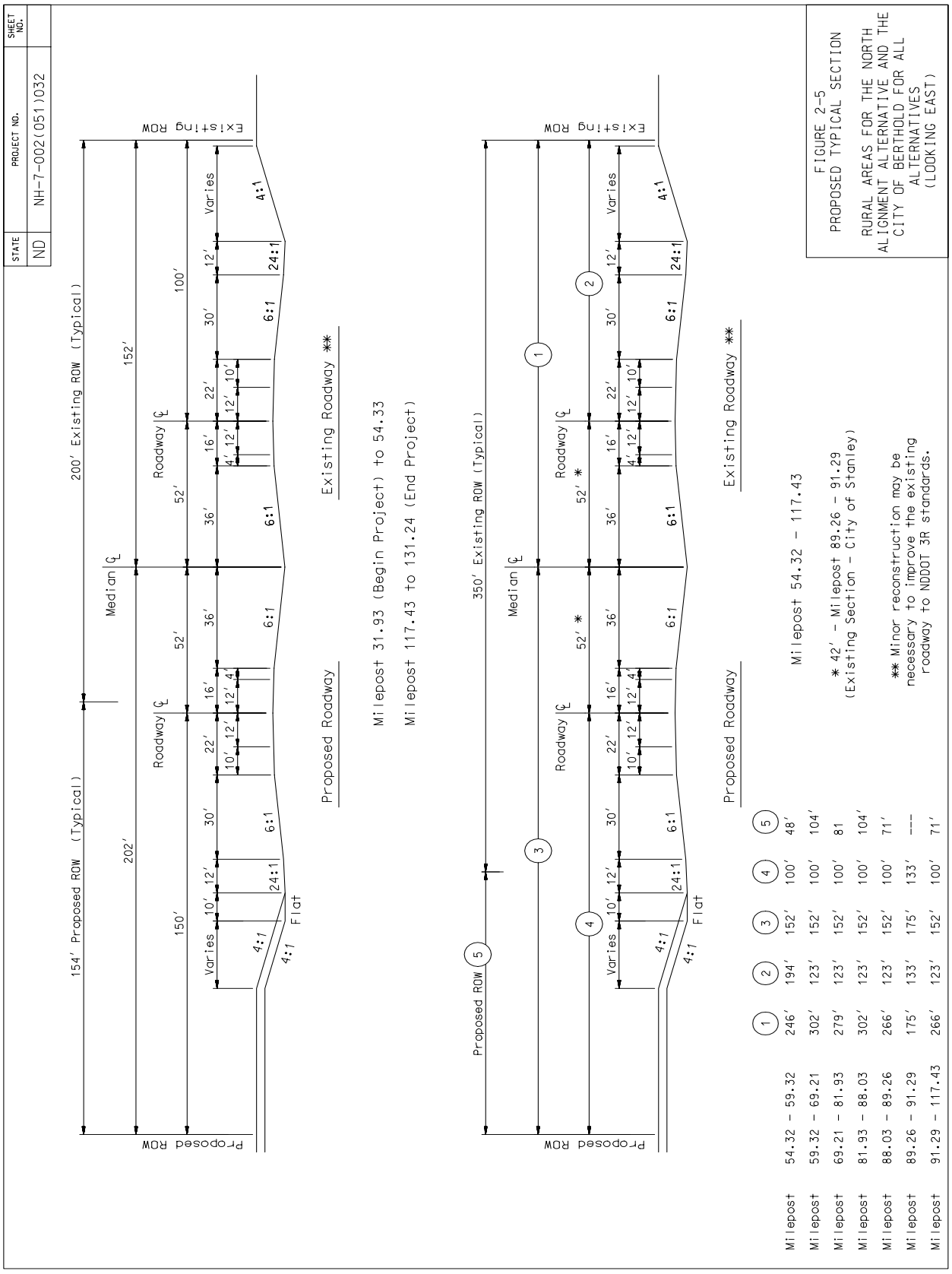
The existing roadway through Ross is already located along the south side of the city, south of most houses, buildings, and businesses (Figure B-6 in appendices). Therefore, the new roadway would be constructed south of the existing roadway, using the same alignment as the South Alternative. This alignment also fully uses the existing 350 feet of ROW within Ross. Transitions would occur west and east of Ross and require minor reconstructions in these areas. The proposed typical section through the city of Ross (approximate milepost 81.92 to 83.59) is the same as the rural section shown in Figure 2-2.

The alignment of the north roadway transitions toward the existing roadway to meet the present section at Stanley. This section is a divided four-lane highway with an 84-foot centerline-to-centerline distance. The existing typical section through the city of Stanley (approximate milepost 89.26 to 91.29) is shown in Figure 2-4. The new roadway transitions back to a 104-foot centerline-to-centerline distance east of Stanley.

The new roadway alignment through Berthold would be essentially the same as the South Alignment Alternative. A rural typical section (Figure 2-5) through Berthold is proposed with the new roadway located on the north side of the existing roadway to avoid industrial facilities, businesses, and school property (Figure B-7 in appendices). Impact analysis was revised from the DEIS and is now based on using an 84-foot centerline-to-centerline rural section as exists in Stanley. One house located north of the existing roadway will be less than 41 feet from the outside shoulder of the new roadway. The impact analysis assumes this house will be relocated.

The new roadway transitions back to the south side of the existing roadway near the horizontal curve at the eastern limits of Berthold (approximate milepost 123.81). This avoids a salvage yard business located on the north side of the existing roadway (Figure B-5 and B-7 in appendices). The transitions will

Figure 2-5. Proposed Typical Sections



require partial reconstruction of the existing roadway to accomplish the realignment. The new roadway transitions back to the north side of the existing roadway (approximate milepost 124.61) east of the salvage yard.

A rural typical section is proposed through Berthold, with the new roadway located on the north side of the existing roadway (Figure 2-5). Impact analysis was revised from the DEIS and is now based on using an 84-foot centerline-to-centerline rural section as exists in Stanley.

Although the impact analysis is based on the alignment and typical section described, an alignment shift or partial reconstruction may also be considered from mileposts 86.59 to 88.13 and 93.3 to 94.14 to avoid railroad impacts. The alignment shift or partial reconstruction would be used to maintain the necessary horizontal separation between US 2 and the railroad tracks, therefore, eliminating the need for track relocation.

The existing ROW width for the rural areas west of Ray and from nearly four miles west of Berthold to the east (milepost 31.93 to 54.32 and milepost 117.43 to 131.24) is typically 200 feet. Therefore, an estimated 154 feet of new ROW needs to be purchased measuring from the existing north ROW boundary. The existing ROW width for the rural areas east of Ray to nearly four miles west of Berthold (milepost 54.32 to 117.43) is typically 350 feet. The centerline of the existing roadway is generally offset to the north within this ROW. Through these rural areas, the estimated new ROW needs range from 48 feet to 104 feet, measuring from the existing north ROW boundary. This provides 204 feet of ROW from the centerline of the existing roadway, the minimum necessary to construct the typical section.

The need for additional permanent ROW is not anticipated within the cities of Ray, Ross, and Stanley. The existing ROW width through Berthold is typically

200 feet. Therefore, an estimated 154 feet of new ROW needs to be purchased measuring from the existing north ROW boundary.

2.4.4 Selective North-South Alignment Alternative (Preferred)

The Selective North-South Alignment Alternative (preferred) consists of providing a divided four-lane highway by selectively constructing a new roadway (two-lane with 70-mph design speed) north or south of and parallel to the existing roadway (Figure 2-6). Reverse curves will be used to transition the new roadway from one side to the other side of the existing roadway. This alternative was developed because it offers the maximum possible flexibility to avoid and minimize direct impacts to or encroachment upon farmsteads, occupied residences, industrial structures, missile silos, cultural resources, wetlands, and easement wetlands. This alternative is a combination of the North Alignment and South Alignment Alternatives. Locations where the new roadway would be added north or south of the existing roadway are listed in Table 2-1.

Some partial reconstruction of the existing roadway will be needed to successfully transition the new roadway. During final design, it may be possible to reduce the curve length necessary to transition the new roadway to minimize the amount of new ROW required.

Depending on whether the new roadway is added south or north of the existing roadway, the proposed typical sections for the rural areas are the same as for the South Alignment or North Alignment Alternatives as shown in Figures 2-2 and 2-5, respectively. The new roadway is offset 84 to 104 feet from the centerline of the existing roadway. Paved shoulders, with a width of four feet on the inside next to the median and ten feet on the outside of each roadway (new and existing), are proposed. Shoulder inslopes are designed at a 6:1 (horizontal: vertical) grade.

The new roadway approaches the west side of Ray on the south side of the existing roadway. The alignment of the new roadway transitions north to meet

the existing urban undivided four-lane section (with a common left-turn lane) through the city. The alignment of the new roadway then transitions back to the south side of the existing roadway once through the city of Ray. The existing typical five-lane sections through the city of Ray (approximate mileposts 52.88 to 54.20) are shown in Figure 2-3. The preferred alternative was modified to extend this five-lane section to the west approximately three-eights of a mile to reduce the wetland impacts adjacent to McLeod Lake.

The typical section through the White Earth River Valley (approximate MP 71 to MP 76) was modified to a 54-foot centerline-to-centerline distance to avoid and to minimize impacts to wetlands and cultural resources. Like the other build alternatives, the preferred alternative originally was 104 feet from centerline to centerline-to-centerline distance thereby eliminating most to the median and narrowing the footprint of the roadway through this sensitive area.

The existing roadway through Ross is already located along the south side of the city, south of most houses, buildings, and businesses. Therefore, the new roadway would be constructed south of the existing roadway. This alignment also fully uses the existing 350 feet of ROW within Ross. The proposed typical section through the city of Ross (approximate milepost 81.92 to 83.59) is the same as the rural section shown in Figure 2-2.

The new roadway approaches the west side of Stanley, south of the existing roadway. The alignment of the south roadway transitions toward the existing roadway to meet the present section at Stanley. This section is a divided four-lane highway with an 84-foot centerline-to-centerline distance. The existing typical section through the city of Stanley (approximate milepost 89.26 to 91.29) is shown in Figure 2-4. The new roadway transitions back to 84 to 104 feet centerline-to-centerline distance east of Stanley.

Table 2-1
New Roadway Location for the
Selective North-South Alignment Alternative (Preferred)

US 2 Section	New Roadway Location	Approximate Milepost
Section 1	South	31.93 to 52.88
Section 2	Existing	52.88 to 54.2 (existing section through Ray)
Section 3	South	54.2 to 81.92 (west side of Ross)
Section 4	South	81.92 to 83.59 (east side of Ross)
Section 5	South	83.59 to 84.2
Section 6	North	84.2 to 85.6
Section 7	South	85.6 to 89.26
Section 8	Existing	89.26 to 91.29 (existing section through Stanley)
Section 9	South	91.29 to 114.8
Section 10	North	114.8 to 116.15
Section 11	North	116.15 to 120.5 (west side of Berthold)
Section 12	North	120.5 to 124.14 (east side of Berthold)
Section 13	South	124.14 to 128.95
Section 14	South	128.95 to 130.18
Section 15	South	130.18 to 131.24

The new roadway alignment through Berthold would be essentially the same as the South Alignment and North Alignment Alternatives. The new roadway is proposed north of the existing roadway through Berthold to avoid industrial facilities, businesses, and school property (Figures B-3 and B-7 in appendices). One house located north of the existing roadway will be less than 41 feet from the outside shoulder of the new roadway. The impact analysis assumes this house will be relocated.

In order to avoid easement wetlands, minor modifications have been made to the preferred alternative, which offers maximum flexibility to shift the roadway in order to avoid important resources. The alignment of this alternative was adjusted from six miles west of Berthold to the east side of Berthold. The new roadway

transition, from the south side to the north side of the existing roadway, was changed from approximate MP 114.5 to approximate MP 114.9 to avoid easement wetlands. The new roadway will not transition back to the south side until it reaches the east side of Berthold (approximate milepost 124.14). This modification will avoid impacts to easement wetlands, minimize impacts to non-easement wetlands, and avoid relocation impact to the farmhouse located north of US 2 at MP 117. This modification is not practical with the other build alternatives. Modifications to the other build alternatives would need to be extensive in order to match the comprehensive direct impact avoidance and minimization realized with the preferred alternative. These extensive modifications to the other build alternatives would in essence convert them to the Selective North-South Alignment Alternative (preferred).

A rural typical section is proposed through Berthold with the new roadway located on the north side of the existing roadway. The impact analysis was revised based on a reduced rural section with an 84-foot centerline-to-centerline as exists in Stanley (Figure 2-4).

The existing ROW width for the rural areas west of Ray and from four miles west of Berthold to the east (milepost 31.93 to 54.32 and milepost 117.43 to 131.24) is typically 200 feet. Therefore, an estimated 154 feet of new ROW needs to be purchased, measuring from the existing ROW boundary, when the road is placed south or north of the existing road. The existing ROW width for the rural areas east of Ray to nearly four miles west of Berthold (milepost 54.32 to 117.43) is typically 350 feet. The centerline of the existing roadway is generally offset to the north within this ROW. Through these rural areas, the new roadway would be constructed within this ROW when the road is south of the existing roadway. The estimated new ROW ranges from 48 to 154 feet, measured from the existing ROW boundary, when the road is placed north of the existing roadway.

The need for additional permanent ROW is not anticipated within the cities of Ray, Ross, and Stanley. The existing ROW width through Berthold is typically 200 feet. Therefore, the estimated 154 feet of new ROW needs to be purchased measuring from the existing north ROW boundary.

The Selective North-South Alignment Alternative (preferred) offers the maximum possible flexibility to locate the new roadway to the south from MP 128.95 to MP 130.18. This modification from the DEIS will keep the new roadway on the south side of the existing roadway to avoid impacts to easement wetlands, reduce construction costs, and provide a safer roadway by eliminating two sets of double-reverse curves. This modification will require one more farmstead relocation.

2.4.5 Basis for Selection of Preferred Alternative:

The Selective North-South Alignment Alternative was selected, as the preferred alternative. This alternative was developed as a combination of the North and South Alignment Alternatives because it offers the maximum possible flexibility to avoid and to minimize direct impacts to or encroachment upon farmsteads, occupied residences, industrial structures, missile silos, cultural resources, wetlands, and easement wetlands. The Preferred Alternative will use the existing roadway primarily as the westbound roadway (approximately 91 miles) with a small portion of it used for the eastbound roadway (approximately 9 miles). Not one of the alternatives has the least total impacts in all categories of impacts (see Table 2-2).

The North Alignment Alternative has the least estimated total wetland impacts at 75.15 acres, which compares to 79.84 acres of wetland impacts for the Preferred Alternative. The difference (less than 6 percent) is minimal and the North Alternative wetland impacts are essentially equal to the Preferred Alternative. On the other hand, it requires the most easement wetland replacements at 11.12 acres and has the second most jurisdictional wetland impacts at 7.22 acres where the

Preferred Alternative has no easement wetland impacts and the least jurisdictional wetland impacts at 6.97 acres.

The North Alternative has the most prime farmland impacts at 55 acres as compared to 28 acres for the Preferred Alternative. The North Alternative will also have the most relocation impacts (ten, including one business relocation) whereas the Preferred Alternative will require the least (three, none of which will be a business). In addition to the impacts listed on Table 2-2, the North Alignment will impact a cemetery, requiring relocation of burials, and will require relocation of 29 miles of Stanley's main water supply line. The Preferred Alternative will not impact the cemetery and will only impact 1.4 miles of the waterline. Impacts to cultural resources are similar with one exception; the North Alternative will impact a standing structure eligible for the NRHP. All other impacts are similar between these two alternatives. Because impacts for the North Alternative are greater than the Preferred Alternative in all areas with the exception of the total wetlands, where the two alternatives are similar, the Selective North-South Alignment Alternative (preferred) is considered the environmentally preferred alternative of these two alternatives.

The Complete Reconstruction Alternative has the most estimated total wetland impacts at 87.92 acres, which is slightly more than the Preferred Alternative at 79.84 acres. The Complete Reconstruction will require 1.47 acres of easement wetland replacements and has the most jurisdictional wetland impacts at 8.53 acres whereas the Preferred Alternative has no easement wetland impacts and the least jurisdictional wetland impacts at 6.97 acres.

The Complete Reconstruction Alternative impacts 19 acres of prime farmland as compared to 28 acres for the Preferred Alternative. Complete Reconstruction will require seven relocations whereas the Preferred Alternative will require only three. In addition to the impacts listed on Table 4-8, the Complete Reconstruction Alternative will have greater impact to the traveling public during construction.

All build alternatives, except the Complete Reconstruction Alternative, will leave the existing roadway in place, and traffic will be maintained on it while the new roadway is under construction. Because Complete Reconstruction requires building twice as much roadway, requires twice as much asphalt surfacing, and will require major traffic control, it is estimated to cost more than twice as much as the Preferred Alternative ($279.3 million vs. $109.9 million). All other impacts are similar between these two alternatives. Because impacts for the Complete Reconstruction Alternative are all greater than or similar to the Preferred

Alternative, with the one exception of prime farmland, and because Complete Reconstruction is estimated to cost more than twice as much, the Selective North-South Alignment Alternative (preferred) is considered the environmentally preferred alternative of these two.

The South Alignment Alternative will impact 79.50 acres of wetlands, which is equivalent to the Preferred Alternative at 79.84 acres. The South Alignment will require 0.92 acre of easement wetland replacements and will impact 6.97 acres of jurisdictional wetlands whereas the Preferred Alternative has no easement wetland impacts and the same jurisdictional wetland impacts at 6.97 acres.

The South Alignment Alternative impacts 27 acres of prime farmland similar to the Preferred Alternative, which has 28 acres. The South Alignment will require four relocations whereas the Preferred Alternative will require only three. The additional relocation included in the South Alignment is an active farm located on the south side of the road west of Stanley. At this location, the Preferred Alternative included the new roadway to the north of the existing. Currently,

Table 2-2. Summary of Impact by Alternative

		North Alternative	South Alternative	Selective North/South Alternative (Preferred)	Complete Alternative	No Action
Wetlands						
	Easement	3.11	.81	0	.4	0
	Jurisdictional	7.22	6.97	6.97	8.53	0
	Others[1]	64.82	71.72	72.87	78.99	0
	Total	75.15	79.50	79.84	87.92	0
	Easements[2] Within ROW	11.12	.92	0	1.47	0
Relocations						
	Businesses	1	0	0	0	0
	Homes	9	4	3	7	0
Prime Farmland (Acres)		55	27	28	19	0
Cemeteries		1	0	0	0	0
Cultural Resources						
	Historic Structure	1	0	0	0	0
	Archeological	3	3	3	3	0
	Total	4	3	3	3	0

[1]See Tables D-11 and D-12 in appendices for wetland classifications using the Cowardin system.
[2] Wetlands covered by USFWS easements (considered 4[f] properties) in the new right of way that will have to be replaced at some other location.

NDDOT owns additional right of way to the south. If the Preferred Alternative is selected, this additional right of way can be sold to the adjacent landowner. There are several acres in this right of way that can be returned to prime farmland thereby rendering the impacts slightly less for the Preferred Alternative.

All other impacts are similar between these two alternatives. Because the South Alignment will impact 4(f) property and require an additional relocation, the Selective North-South Alignment Alternative (preferred) is considered the environmentally preferred alternative of these two.

The Preferred Alternative is the only alternative that does not impact 4(f) properties, has the least jurisdictional wetland impacts, has the least relocation impacts, is estimated to be the lowest cost, and all other impacts are similar to or less than the other build alternatives. Modifications to the other build alternatives would need to be extensive in order to match the comprehensive direct impact avoidance and minimization realized with the preferred alternative. These extensive modifications to the other build alternatives would, in essence, convert them to the Selective North-South Alignment Alternative (preferred). The Selective North-South Alignment Alternative (preferred) is considered the environmentally preferred alternative because it provides the greatest overall avoidance and minimization of resource impacts as well as social impacts of all the build alternatives that met the Purpose and Need.

2.4.6 Complete Reconstruction Alternative

The Complete Reconstruction Alternative consists of providing a divided four-lane highway by obliterating the existing roadway and constructing new north and south roadways (two-lane with 70-mph design speed) in the center of the existing ROW. The alignment of the new roadways would parallel the alignment of the existing roadway. The proposed typical section for the rural areas is shown in Figure 2-7. The centerlines of the new roadways would be offset a distance of 104 feet. Shoulder widths would be four feet on the inside and ten feet on the

outside of the new roadways. The driving lanes and shoulders would be paved. Shoulder inslopes would have a 6:1 (horizontal: vertical) grade.

Just west of Ray, the alignment of the new roadways transitions to meet the existing urban undivided four-lane section (with a common left turn lane) through the City. The alignment of the new roadways then transitions back to the 104-foot centerline-to-centerline typical section once through the City of Ray. The existing typical five-lane sections through the City of Ray (approximate mileposts 52.88 to 54.20) are shown in Figure 2-3.

The typical section through the White Earth River Valley (approximate MP 71 to MP 76) was modified to a 54-foot centerline-to-centerline distance to avoid and to minimize impacts to wetlands and cultural resources. Impacts for all build alternatives were adjusted from the DEIS to reflect this modification.

The existing roadway through Ross is already located along the south side of the city, south of most houses, buildings, and businesses. Therefore, the new roadways would be constructed south of the city. This alignment also fully uses the existing 350 feet of ROW within Ross. The proposed typical section through the city of Ross (approximate milepost 81.92 to 83.59) is the same as the rural section shown in Figure 2-2.

The alignment of the new roadways transitions to meet the present section at Stanley. This section is a divided four-lane highway with an 84-foot centerline-to-centerline distance. The existing typical section through the city of Stanley (approximate milepost 89.26 to 91.29) is shown in Figure 2-4. The new roadways transition back to a 104-foot centerline-to-centerline distance east of Stanley.

The new roadway alignment through Berthold would be essentially the same as the South Alignment, North Alignment, and Selective North-South Alignment

Alternatives (preferred). The divided four-lane highway section will be centered within the existing ROW until the beginning of the existing curve (approximate milepost 122.3) on the west side of Berthold. The new roadway will then be added to the north of the existing roadway, as with the other build alternatives.

The new roadway is proposed north of the existing roadway through Berthold to avoid industrial facilities, businesses, and school property (Figures B-3 and B-7 in appendices). A rural typical section is proposed through Berthold with the new roadway located on the north side of the existing roadway. The impact analysis was revised based on a reduced rural section with an 84-foot centerline-to-centerline as exists in Stanley (Figure 2-4). One house, located north of the existing roadway, will be less than 41 feet from the outside shoulder of the new roadway. The impact analysis assumes this house will be relocated.

The new roadway transitions to the south side of the existing roadway near the horizontal curve at the eastern limits of Berthold (approximate milepost 123.81). This avoids a salvage yard business located on the north side of the existing roadway (Figure B-3 and B-7 in appendices). The new roadways then transition back to the center of the existing ROW east of the salvage yard (approximate milepost 124.61).

The existing ROW width for the rural areas west of Ray and from four miles west of Berthold to the east (milepost 31.93 to 54.32 and milepost 117.43 to 131.24) is typically 200 feet. Therefore, an estimated 77 feet of new ROW needs to be purchased north and south measuring from the existing south ROW boundary. The existing ROW width for the rural areas east of Ray to four miles west of Berthold (milepost 54.32 to 117.43) is typically 350 feet. The centerline of the existing roadway is generally offset to the north within this ROW. Through these rural areas, the new roadways would be constructed within this ROW.

The need for additional permanent ROW is not anticipated within the cities of Ray, Ross, and Stanley. The existing ROW width through Berthold is typically 200 feet. Therefore, an estimated 134 feet of new ROW needs to be purchased measuring from the existing north ROW boundary.

2.5 Features Common to the Build Alternatives

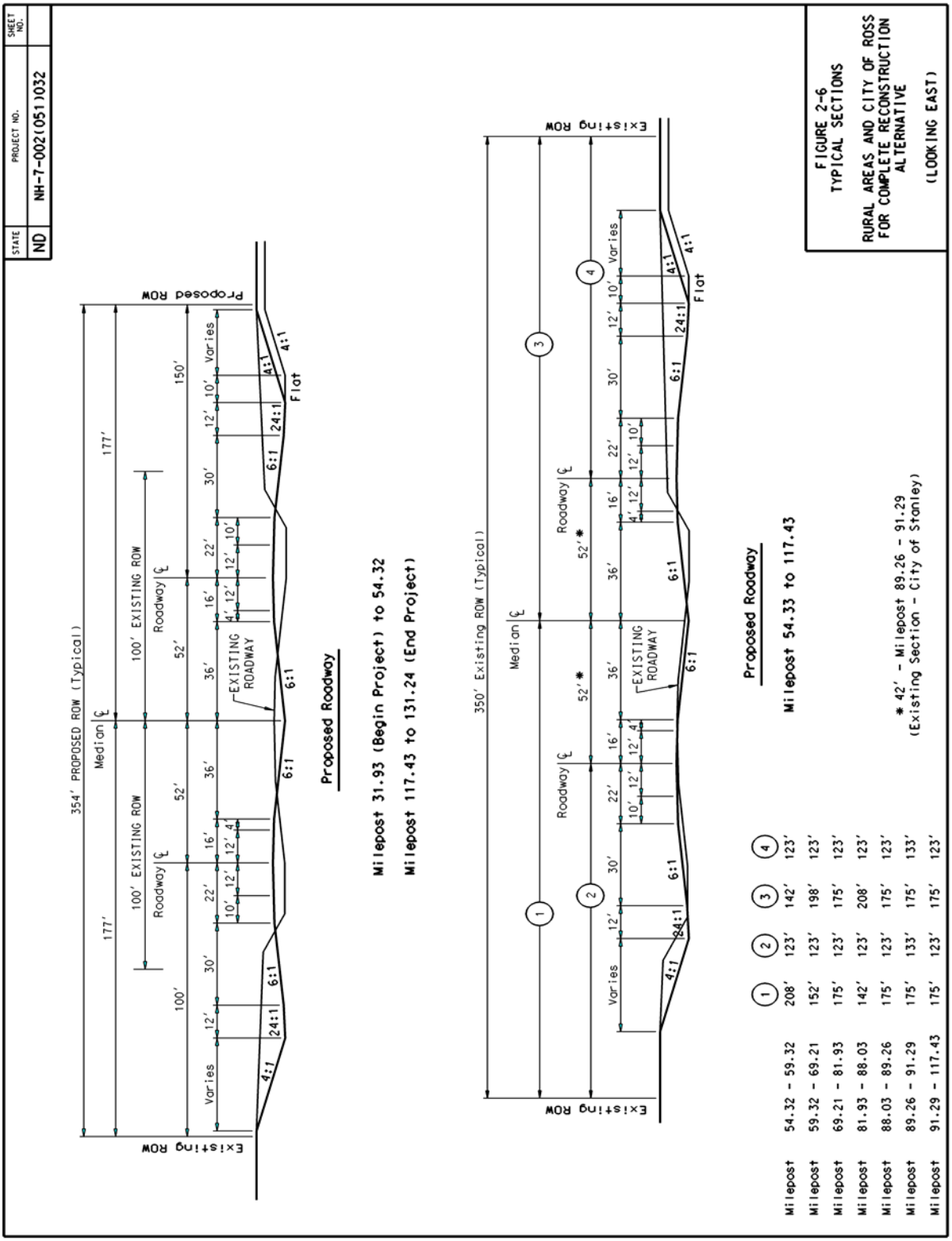
2.5.1 White Earth River Valley

There are several cultural resource sites of concern and several wetlands located in the White Earth River Valley (approximate mileposts 71.0 to 76.0). The impact analysis through the White Earth River Valley was modified from the DEIS for all build alternatives to reflect a 54-foot centerline-to-centerline typical section previously described. The 54-foot distance was included to avoid and to minimize impacts to cultural resource sites and wetlands. During design, minor adjustments to the alignment and cross-section will be investigated to further reduce or minimize impacts.

2.5.2 Existing Roadway Improvements

The existing roadway requires some improvements to accommodate the conversion to a four-lane highway. From US 85 to four miles west of Berthold (milepost 32.4 to 117.4), the existing roadway width is generally 36 to 44 feet and is sufficient to accommodate the required driving lanes and shoulders. From four miles west of Berthold to US 52 (milepost 117.4 to 131.2), the existing roadway width is 32 feet and will require minor widening and additional surfacing on the outside shoulder to provide sufficient shoulder width. The horizontal and vertical curvature of the existing roadway is sufficient for a posted speed of 70 mph for one roadway of a four-lane facility. In addition to the widening, it is anticipated the segment of US 2 extending from US 85 to Ray (milepost 32.4 to 53.3) would require a bituminous overlay. Project impacts related to these improvements have been included in the impact analysis for the respective build alternatives.

Figure 2-6. Typical Sections



2.5.3 Permanent ROW Requirements

The total permanent ROW needs are based upon the width required to construct the typical sections for an alternative. The existing ROW was determined from NDDOT ROW plats. Additional ROW needs were based on the assumption that the new roadway would be at the same elevation as the crown of the existing roadway and at the same profile grade. Table 2-3 provides a summary of the total and new ROW needs. A portion of the total ROW needs consist of previously acquired ROW. A detailed breakdown of the ROW needs may be found in Appendix C.

Additional ROW or temporary easements may be needed for areas of roadway transitions or areas of excessive cut outside the planned permanent ROW (Appendix C). The additional ROW and temporary easements are located within the area of potential effect, and possible impacts of these easements have been included in evaluation of all alternatives so as to not underestimate any impacts.

Table 2-3
Summary of ROW Needed (Acres)
For the Build Alternatives

	Alternative			
Section	South Alignment	North Alignment	Selective North-South Alignment[1]	Complete Reconstruction
Total (Acres)	540	1,190	580	482

1. Preferred Alternative

2.5.4 Bridges and Culverts at Stream and River Crossings

Two bridges and eight culverts provide stream and river crossings along US 2. Bridges over a stream or river are located at the Little Muddy Creek (milepost 33.33) and the White Earth River (milepost 73.22). Reinforced Box

Culverts (RBCs) are located at one intermittent stream crossing (milepost 57.04) and the Little Knife River (milepost 91.42). The other crossings consist of Structural Plate Pipes (SPP) located at several intermittent stream crossings (mileposts 33.09, 36.35, 44.76, 45.07, 45.85, 57.04, 91.42 128.90) (Table D-1).

Each alternative requires the construction of new bridges adjacent to the existing bridges. Extensions will be added to the existing RBC. Based upon the age and condition of the SPP culverts, it is likely the existing SPP will be removed and new RBCs installed at these locations. In some cases, minor channel reshaping will be necessary immediately upstream and downstream to accommodate the longer culverts associated with widening.

2.5.5 Railroad Crossings

Each build alternative requires the widening or the addition of an adjacent structure for the grade separation over the Burlington-Northern Santa Fe (BNSF) mainline tracks near Tagus (milepost 116.45). An existing at-grade crossing will require widening for the BNSF branch line track located just west of Berthold (milepost 121.92). This at-grade crossing is currently protected with automatic flashing light signals with short arm gates, advanced warning signs, and pavement markings. It is anticipated that the same type of safety features that are currently in use will protect the expanded crossings. Within the city of Ray (milepost 53.71), a bridge passes over the BNSF tracks. No modification of this bridge is needed.

2.6 Opinion of Probable Cost

The opinion of probable cost for the build alternatives ranges from $110 million for the Selective North-South Alignment Alternative (preferred) to $280 million for Complete Reconstruction Alternative (Table 2-4). The opinion is based upon typical 2002 unit costs for projects within North Dakota. The greater cost of the Complete Reconstruction

Alternative reflects the need to obliterate the existing roadway prior to construction of the divided four-lane highway and the reconstruction of two roadways rather than one.

Table 2-4
Opinion of Probable Cost for the Build Alternatives (millions)

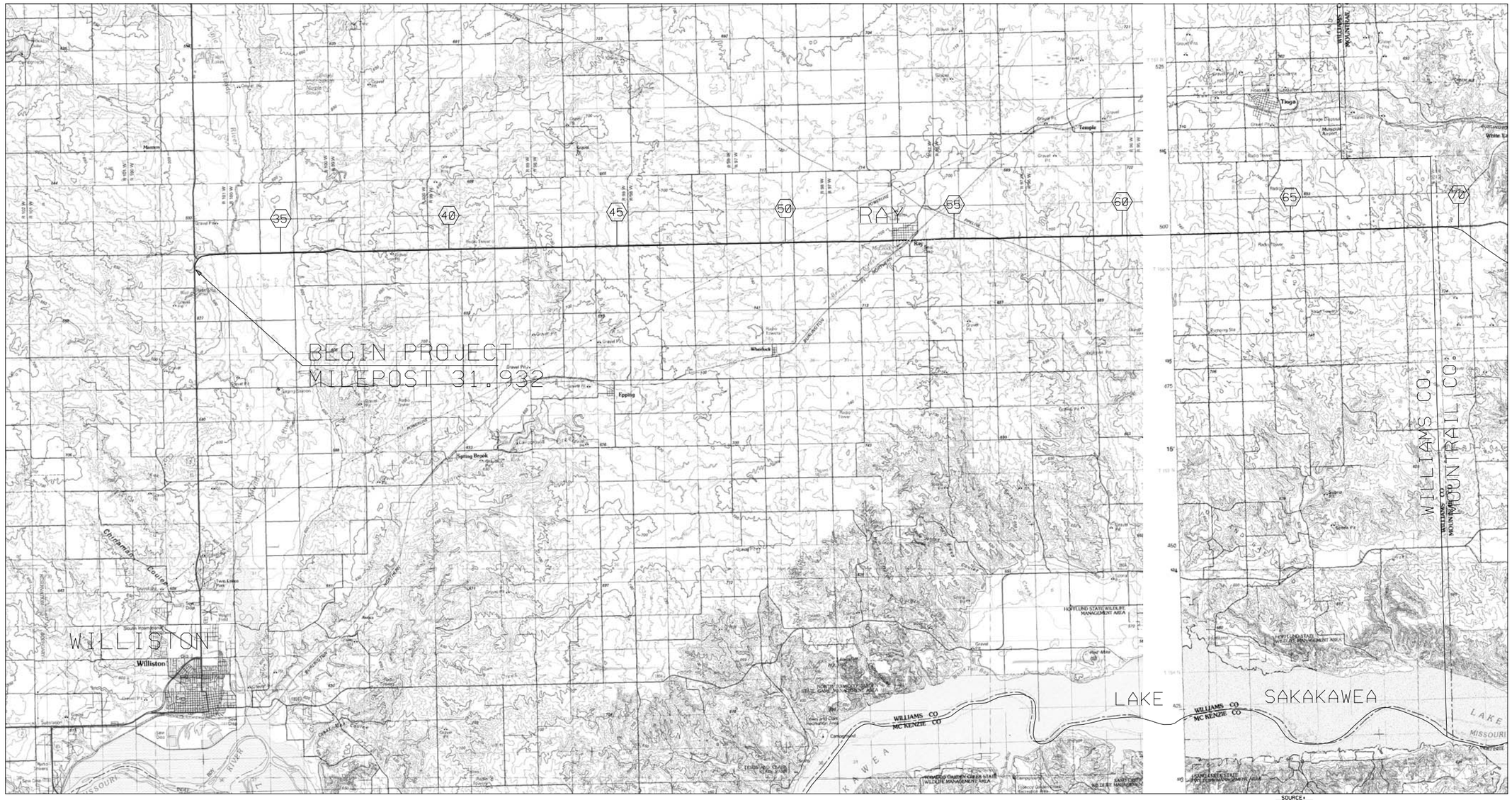
	Alternatives				
Description	**South Alignment**	**North Alignment**	**Selective North-South Alignment[1]**	**Complete Reconstruction**	**No Action (3R Upgrade)**
Construction	$109.2	$109.5	$109.2	$278.2	$5.2
New ROW	$0.4	$0.7	$0.4	$0.3	$0.0
Relocation	$0.4	$1.1	$0.3	$0.8	$0.0
Total	$110.0	$111.3	$109.9	$279.3	$5.2

1. Preferred Alternative

Figure 2-7. Transition Locations for the Selective North-South Alignment Alternative (Page 1 of 3)

Figure 2-7. Transition Locations for the Selective North-South Alignment Alternative (Page 2 of 3)

Figure 2-7. Transition Locations for the Selective North-South Alignment Alternative (Page 3 of 3)



SOURCE:
BASE MAP ASSEMBLED FROM U.S.G.S 1:100,000 SCALE TOPOGRAPHIC MAPS

(50) = MILEPOINT MARKER

SELECTIVE NORTH/SOUTH ALTERNATIVE

HIGHWAY SEGMENT	LANE LOCATION FROM PRESENT ROAD
MILEPOST 31.93 TO MILEPOST 52.88	NEW LANE TO THE SOUTH
MILEPOST 52.88 TO MILEPOST 54.20	EXISTING SECTION (RAY, ND)
MILEPOST 54.20 TO MILEPOST 81.92	NEW LANE TO THE SOUTH
MILEPOST 81.92 TO MILEPOST 83.59	NEW LANE TO THE SOUTH (ROSS, ND)
MILEPOST 83.59 TO MILEPOST 84.20	NEW LANE TO THE SOUTH
MILEPOST 84.20 TO MILEPOST 85.60 *	NEW LANE TO THE NORTH
MILEPOST 85.60 TO MILEPOST 89.26	NEW LANE TO THE SOUTH
MILEPOST 89.26 TO MILEPOST 91.29	EXISTING SECTION (STANLEY, ND)
MILEPOST 91.29 TO MILEPOST 114.90	NEW LANE TO THE SOUTH
MILEPOST 114.90 TO MILEPOST 116.15 *	NEW LANE TO THE NORTH
MILEPOST 116.15 TO MILEPOST 120.50	NEW LANE TO THE NORTH
MILEPOST 120.50 TO MILEPOST 124.14 *	NEW LANE TO THE NORTH (BERTHOLD, ND)
MILEPOST 124.14 TO MILEPOST 128.95	NEW LANE TO THE SOUTH
MILEPOST 128.95 TO MILEPOST 130.18 *	NEW LANE TO THE SOUTH
MILEPOST 130.18 TO MILEPOST 131.24	NEW LANE TO THE SOUTH

* INCLUDES TRANSITION ZONES.

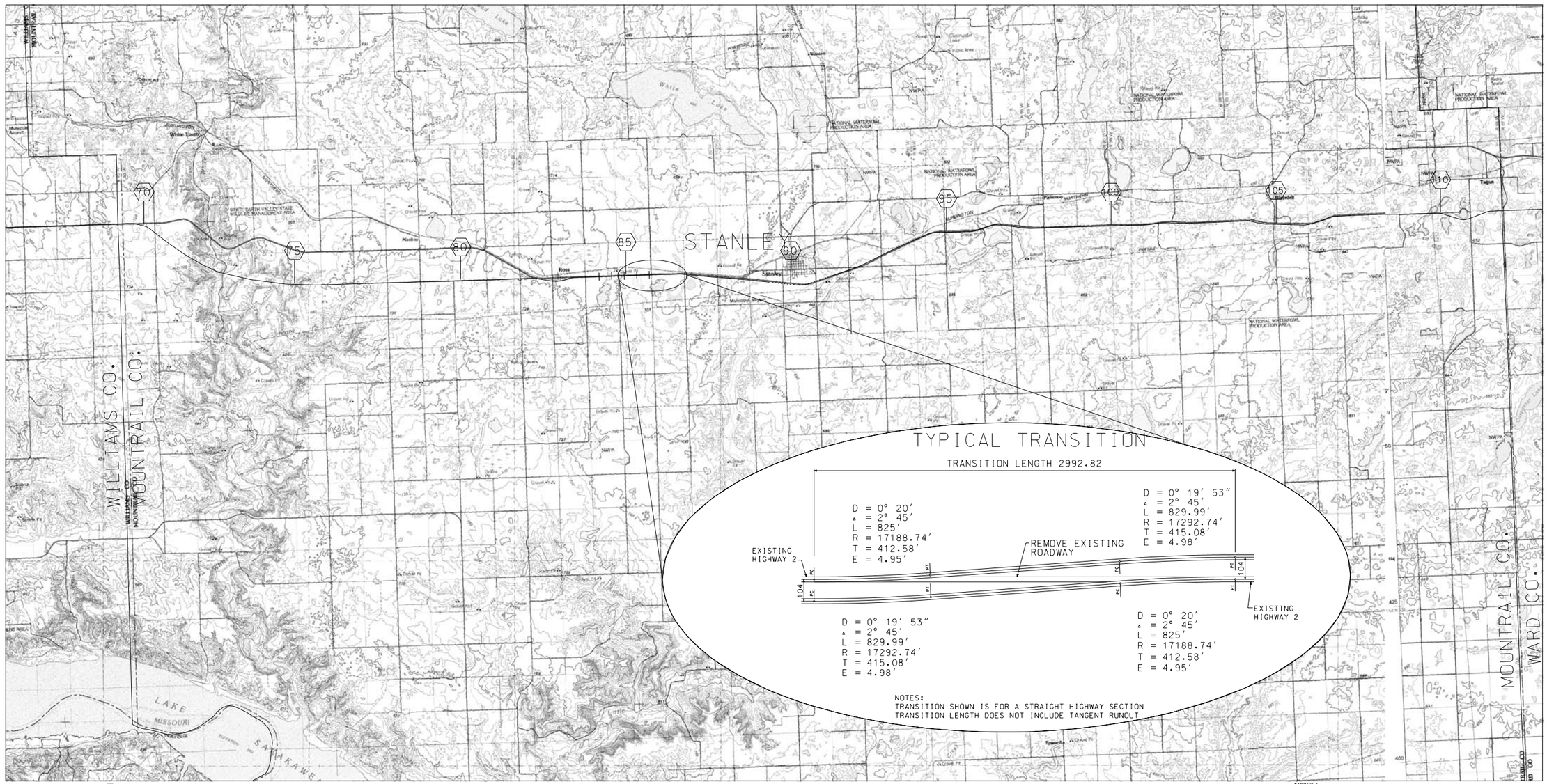
LEGEND

- HIGHWAY SEGMENT WITH NEW LANE TO THE SOUTH
- HIGHWAY SEGMENT WITH NEW LANE TO THE NORTH
- USE EXISTING ROADWAY

N

8000 0 8000 16000
SCALE FEET

FIGURE 2-7 (1 OF 3)
TRANSITION LOCATIONS FOR THE
SELECTIVE NORTH-SOUTH ALIGNMENT



SOURCE:
BASE MAP ASSEMBLED FROM U.S.G.S 1:100,000 SCALE TOPOGRAPHIC MAPS

60 = MILEPOINT MARKER

N

8000 0 8000 16000
Scale Feet

SELECTIVE NORTH/SOUTH ALTERNATIVE

Highway Segment	LANE LOCATION FROM PRESENT ROAD
Milepost 31.93 to Milepost 52.88	New Lane to the South
Milepost 52.88 to Milepost 54.20	Existing Section (Ray, ND)
Milepost 54.20 to Milepost 81.92	New Lane to the South
Milepost 81.92 to Milepost 83.59	New Lane to the South (Ross, ND)
Milepost 83.59 to Milepost 84.20	New Lane to the South
Milepost 84.20 to Milepost 85.60 *	New Lane to the North
Milepost 85.60 to Milepost 89.26	New Lane to the South
Milepost 89.26 to Milepost 91.29	Existing Section (Stanley, ND)
Milepost 91.29 to Milepost 114.90	New Lane to the South
Milepost 114.90 to Milepost 116.15 *	New Lane to the North
Milepost 116.15 to Milepost 120.50	New Lane to the North
Milepost 120.50 to Milepost 124.14 *	New Lane to the North (Berthold, ND)
Milepost 124.14 to Milepost 128.95	New Lane to the South
Milepost 128.95 to Milepost 130.18 *	New Lane to the South
Milepost 130.18 to Milepost 131.24	New Lane to the South

* Includes Transition Zones.

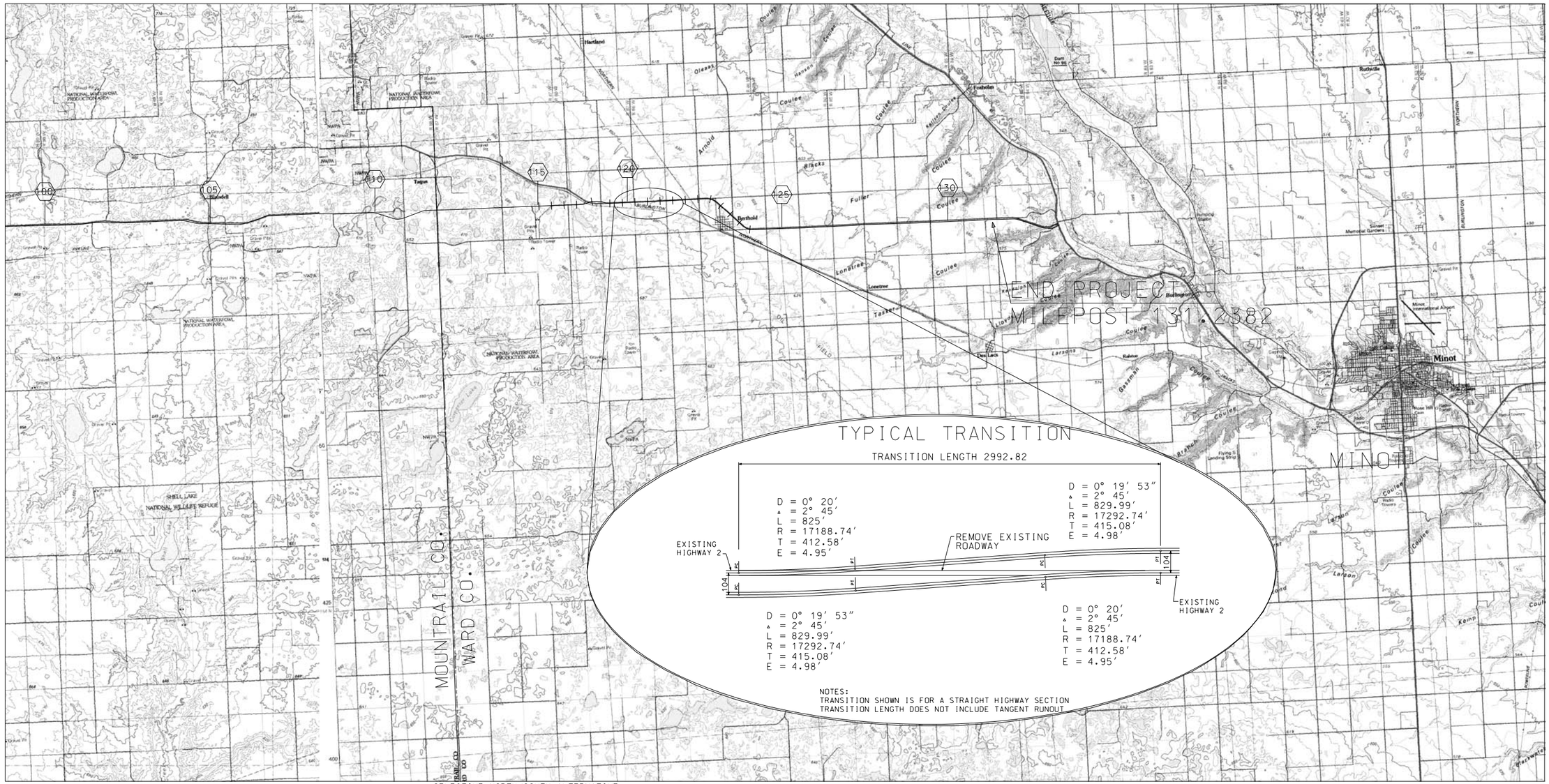
LEGEND

= HIGHWAY SEGMENT WITH NEW LANE TO THE SOUTH

= HIGHWAY SEGMENT WITH NEW LANE TO THE NORTH

= USE EXISTING ROADWAY

FIGURE 2-7 (2 of 3)
TRANSITION LOCATIONS FOR
SELECTIVE NORTH-SOUTH ALIGNMENT



(50) = MILEPOINT MARKER

N

8000 0 8000 16000
Scale Feet

SELECTIVE NORTH/SOUTH ALTERNATIVE

Highway Segment	LANE LOCATION FROM PRESENT ROAD
Milepost 31.93 to Milepost 52.88	New Lane to the South
Milepost 52.88 to Milepost 54.20	Existing Section (Ray, ND)
Milepost 54.20 to Milepost 81.92	New Lane to the South
Milepost 81.92 to Milepost 83.59	New Lane to the South (Ross, ND)
Milepost 83.59 to Milepost 84.20	New Lane to the South
Milepost 84.20 to Milepost 85.60 *	New Lane to the North
Milepost 85.60 to Milepost 89.26	New Lane to the South
Milepost 89.26 to Milepost 91.29	Existing Section (Stanley, ND)
Milepost 91.29 to Milepost 114.90	New Lane to the South
Milepost 114.90 to Milepost 116.15 *	New Lane to the North
Milepost 116.15 to Milepost 120.50	New Lane to the North
Milepost 120.50 to Milepost 124.14 *	New Lane to the North (Berthold, ND)
Milepost 124.14 to Milepost 128.95	New Lane to the South
Milepost 128.95 to Milepost 130.18 *	New Lane to the South
Milepost 130.18 to Milepost 131.24	New Lane to the South

* Includes Transition Zones.

LEGEND

= HIGHWAY SEGMENT WITH NEW LANE TO THE SOUTH

= HIGHWAY SEGMENT WITH NEW LANE TO THE NORTH

= USE EXISTING ROADWAY

SOURCE:
BASE MAP ASSEMBLED FROM U.S.G.S 1:100.000 SCALE TOPOGRAPHIC MAPS

FIGURE 2-7 (3 of 3)
TRANSITION LOCATIONS FOR THE
SELECTIVE NORTH-SOUTH ALIGNMENT