5.0 DEVELOPMENT and EVALUATION of ALTERNATIVES

The purpose of this section is to document the development and evaluation of alternatives for the TH 14 West Corridor using the goals and objectives as defined in Chapter 1. In Chapter 3, the corridor was divided into eight segments with unique operational characteristics, and evaluated by the number of access points on TH 14, traffic operations, no passing zones, vehicle mobility, and roadway safety. Chapter 4 identifies the deficiencies within each segment, supporting the need for the project and defining locations for improvements to the TH 14 Corridor. This chapter documents the development and evaluation of alternatives to address the identified deficiencies.

5.1 UNIVERSE OF ALTERNATIVES

This section defines the process used to develop a universe of alternatives that will be screened using the evaluating criteria. Both design and location alternatives were developed.

5.1.1 Development of Alternatives

The development of a universe of alternatives is an iterative process that follows a series of steps, including: identification of deficiencies; public input to identify opportunities and constraints; avoidance of environmental resources; and consistency with local land use plans and Mn/DOT design guidelines. Each step in the process is described in more detail in the following paragraphs and is shown on **Figure 5.1-1.**

Identify Deficiencies

The alternatives development process starts with identifying deficiencies to determine if there is a need for improvements and the extent of those improvements. If there are no deficiencies, then the process stops. For this project there are a number of deficiencies that need to be addressed that include safety, operations and geometric design deficiencies that are outlined in Chapter 3: Existing and Forecast Conditions and in Chapter 4: Identification of Deficiencies.

Public and Agency Input

Public and agency input is integral to identifying issues along the corridor. (The Public Involvement Program is outlined in Chapter 2.) An Advisory Committee, Project Management Team, and input at the Public Information Open House have confirmed the issues identified in the technical analysis. The public and agency input helped to identify opportunities and constraints to the development of alternative roadway improvements.

Development of Alternatives Process

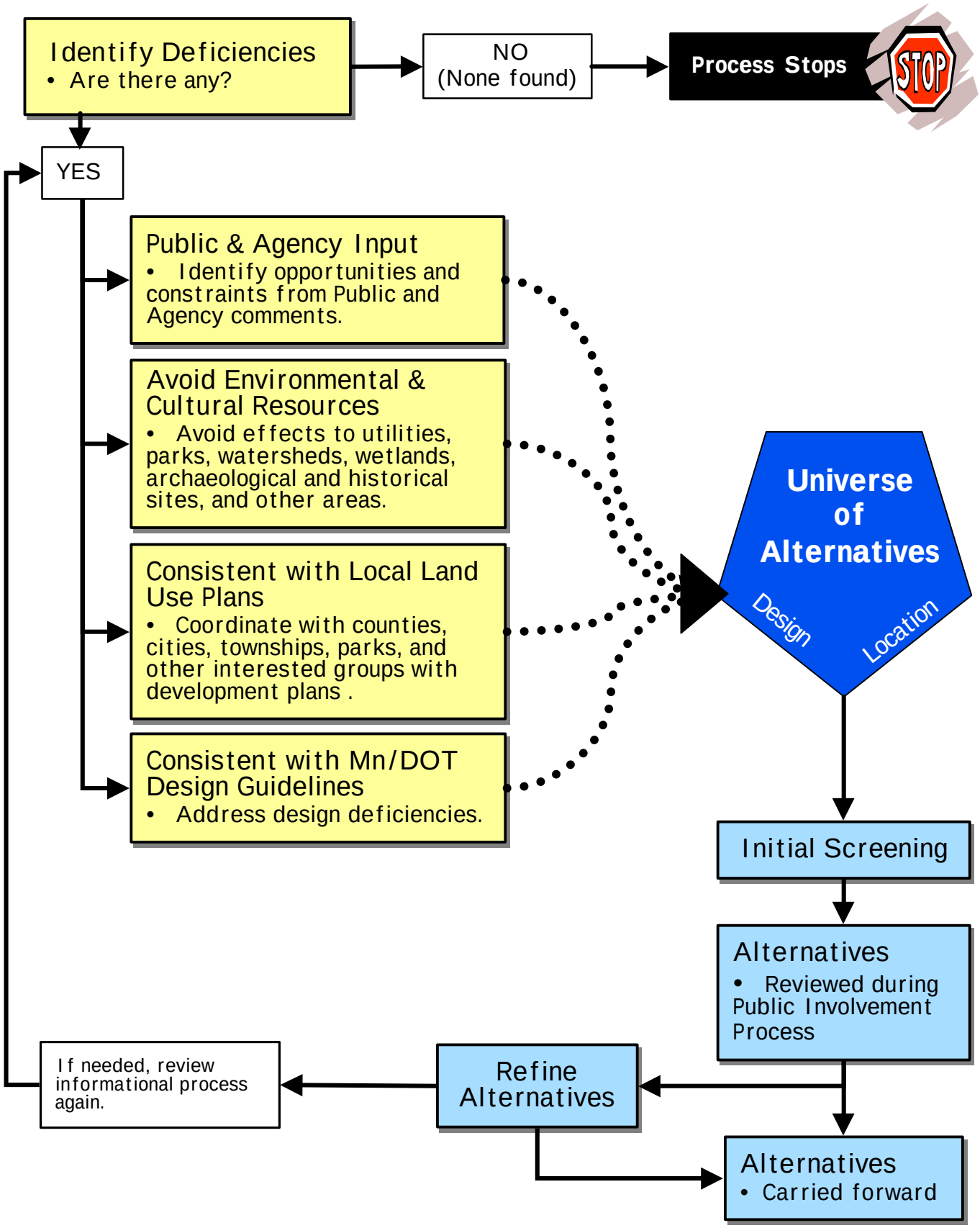


Figure 5.1-1
Development of Alternatives Process

Avoid Known Sensitive Environmental and Cultural Resources

A critical aspect of developing potential alternatives is to use a proactive approach by avoiding known sensitive environmental and cultural resources. The MN DNR and the MN PCA have been integral in providing information along the corridor. In this project, the north and south bypass options have taken into consideration and avoided or minimized impacts to parks, wetlands, cemeteries, and the Swan Lake Wildlife Management Area, as well as the sewage treatment ponds south of Nicollet.

Consistent with Local Land Use Plans

Information on existing and future development in the corridor was gathered from the Cities of Courtland and Nicollet and from Nicollet County Environmental Services. Nicollet County has not allowed urban land uses to be located in the agricultural districts of the County since 1981. The City of Courtland's 1998 Comprehensive Land Use Plan shows the relocation of TH 14 to the north of future planned development areas. According to the City of Nicollet 1986 Land Use Plan, the relocation of TH 14 to the south would provide good access to the planned industrial development on the south end of town. All of this input was taken into consideration when developing the conceptual alternatives.

Consistent with Mn/DOT Design Guidelines

Mn/DOT's design guidelines were followed in the development of design alternatives in the corridor. Key design guidelines considered during the preparation of concept alignment layouts included vertical and horizontal curvature, basic number of travel lanes, major intersection locations, and estimated right-of-way requirements.

Aerial photos, United State Geological Survey (U.S.G.S.) maps, and various environmental data bases were examined to determine potential locations for alternative alignments that would address the deficiencies along the corridor while minimizing impacts to the surrounding land uses – natural and cultural resources. The results of the alternatives development process include the location and roadway design alternatives described in the following sections.

5.1.2 No-Build Alternative

The No-Build Alternative represents no change to the transportation facility along the TH 14 West Corridor beyond already committed projects. This includes only those roadway improvements defined in the appropriate agencies' Long Range Transportation Plan for which funding has been committed. Committed projects for this section of TH 14 include an overlay of TH 14 from TH 15 to Nicollet, and safety improvements at the intersections of TH 14/TH 15 and at TH 14/CSAH 37. The No-Build Alternative provides a basis for comparison of the Build alternatives to determine the future impacts if no major construction improvements are implemented in the study area.

5.1.3 Roadway Design Alternatives

Roadway design alternatives were developed to evaluate three typical roadway designs: an improved two-lane rural roadway, a four-lane urban roadway, and a four-lane rural roadway, and their ability to meet the needs of the TH 14 Corridor. Typical roadway and right-of-way widths for each design alternative are shown on **Figure 5.1-2** and a description of additional roadway characteristics follows:

Alternative A: Improved Two-Lane Rural Roadway

A modern, rural two-lane roadway typically has:

- A 44-foot roadway width, which includes: one 12-foot through-lane in each direction and 10-foot paved shoulders.
- 150 feet of right-of-way.
- Minimum design speed of 60 miles per hour (mph), (the speed limit would be posted at 55 mph consistent with state law).
- Left and right turn lanes at key intersections.
- Managed access.

Alternative B: Four-Lane Urban Roadway

A modern, four-lane urban roadway typically has:

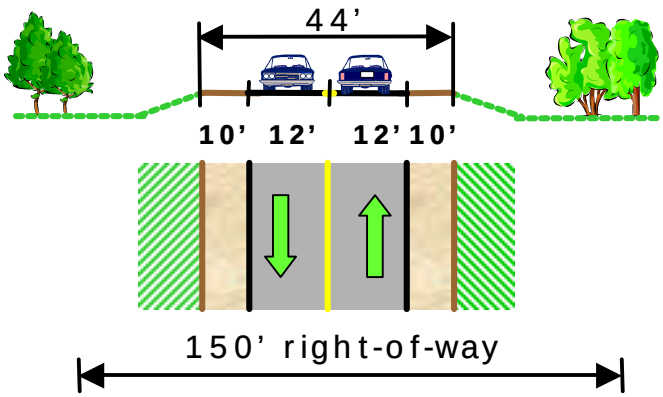
- A 90-foot roadway width which includes: two 12 foot lanes in each direction, 22-foot raised concrete medians (includes 2-foot curb and gutter), 10 foot paved outside shoulders (includes 2-foot curb and gutter), and an enclosed drainage system.
- 150 feet of right-of-way.
- Minimum design speed of 60 mph (the speed limit for similar facilities is typically posted at 35-45 mph depending on specific location, traffic volume, and access features).
- Left and right turn lanes at key intersections.
- Managed access.

Alternative C: Four-Lane Rural Roadway

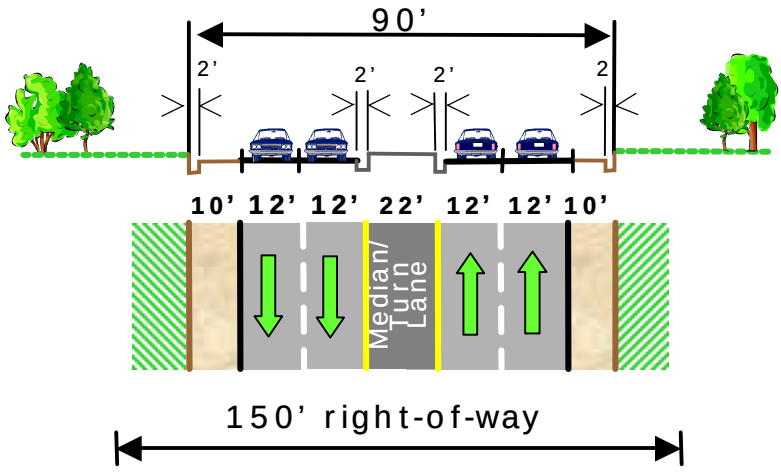
A modern, four-lane rural roadway typically has:

- A 137-foot roadway width which includes: two 12-foot through-lanes in each direction, 11.5-foot outside shoulders (10-foot paved), 5.5-foot inside shoulders (four foot paved), and a 55-foot depressed center grass ditch median (or 66-feet from edge of traveled lane to edge of traveled lane at intersections).
- 300 feet of right-of-way
- Design speed of 70 mph (the speed limit would be posted at 65 mph consistent with state law).
- Left and right turn lanes at key intersections.
- Managed access.

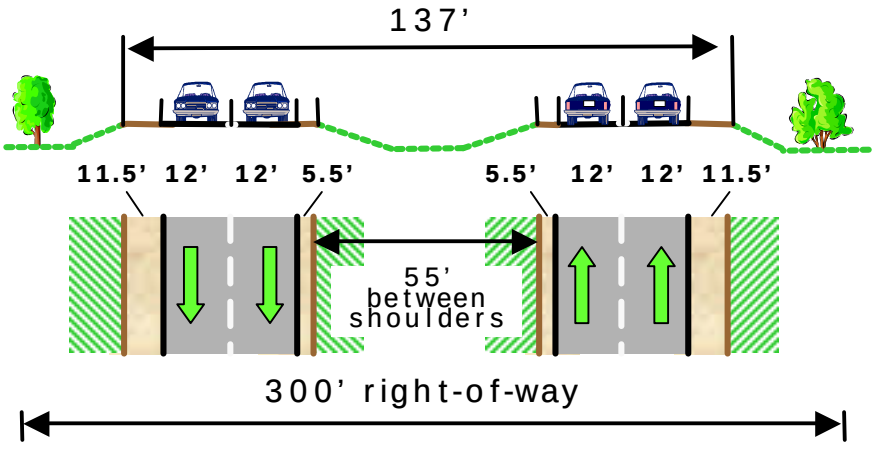
Alternative A: Improved Two-Lane Rural Roadway



Alternative B: Four-lane Urban Roadway



Alternative C: Four-Lane Rural Roadway



14 West IRC

Not to scale

Figure 5.1-2
Roadway Design Alternatives

5.1.4 Location Alternatives

A universe of location alternatives was identified to address the purpose and need for the project. Alternatives were selected based on the deficiencies identified during the analysis of existing and forecast conditions, the results of the origin-destination study, and input from the Advisory Committee and the communities along the TH 14 Corridor.

In Chapter 3, the TH 14 Corridor was divided into eight segments with similar traffic characteristics and adjacent land use to help in the identification and evaluation of deficiencies. The Summary of Deficiencies in Chapter 4 indicates there are five segments that have over five deficiencies each (**Figure 4.2-1)**:

- *Segment 1* - TH 15/CSAH 21 East of New Ulm to CSAH 37
- *Segment 2* - CSAH 37 to Zieske Road west of Courtland
- *Segment 4* - CSAH 12 in Courtland to CSAH 25 East of Courtland
- *Segment 6* - TH 99 in Nicollet to TH 111/CSAH 23 in Nicollet
- *Segment 7* - TH 111/CSAH 23 in Nicollet to CSAH 72 East of Nicollet

Seventy percent of the deficiencies within Segment 1 were related to the TH 14/TH 15/CSAH 21 intersection, while deficiencies within Segment 2 consisted of a mix of intersection and segment deficiencies. The deficiencies within Segments 4, 6, and 7 and the results of the origin-destination study (**Section 3.4.4**) suggest a bypass of the Cities of Nicollet and Courtland as feasible alternatives.

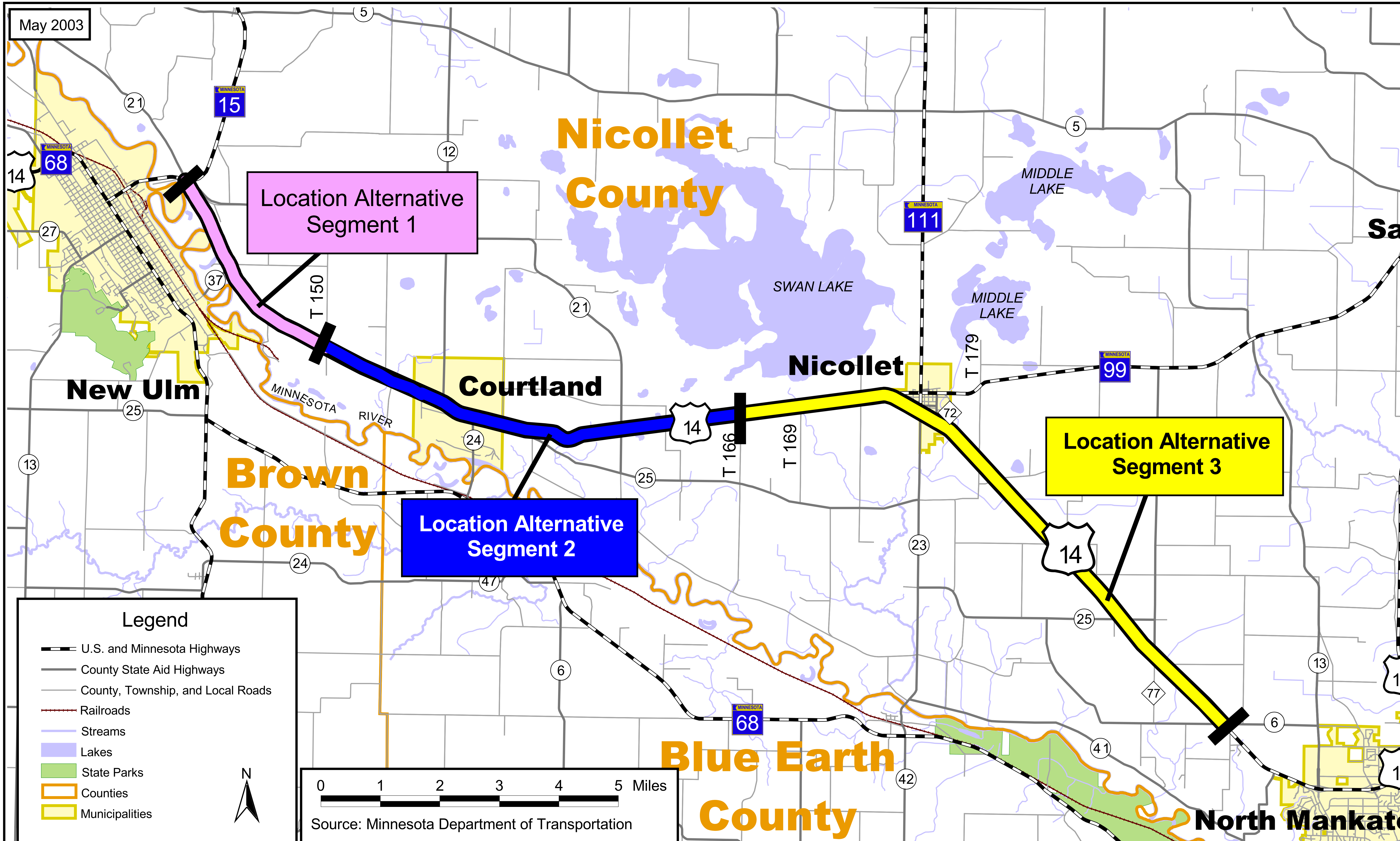
Location Alternative Segments

Since the bypasses span multiple segments, the Corridor was divided into three location alternative segments for the identification and evaluation of alternatives to address the corridor deficiencies. Starting at the west end of the corridor, alignments were developed for: the area in the vicinity of the TH 14/TH 15/CSAH 21 intersection, Courtland, and Nicollet with reasonable connections between them in the rural areas. **Figure 5.1-3** shows the TH 14 segments including:

- *Segment 1 - TH 15/CSAH 21 to Township Road (T) 150*
- *Segment 2 - T 150 to T 166*
- *Segment 3 - T 166 to CSAH 6*

The Universe of Location Alternatives (**Figure 5.1-4)** was developed for each of the three segments using the existing and new alignment options. Alternatives nomenclature system was created to describe each alternative by a code.

A = No-Build: Existing alignment, two-lane design
B = Existing alignment, four-lane design
N = North of existing TH 14
S = South of existing TH 14
1 = Closest to existing TH 14
2 = Furthest from existing TH 14


May 2003
Nicollet County
Brown County
Blue Earth County
New Ulm
Courtland
Nicollet
North Mankato
SWAN LAKE
MIDDLE LAKE
MIDDLE LAKE
MINNESOTA RIVER
Location Alternative Segment 1
Location Alternative Segment 2
Location Alternative Segment 3
T 150
T 166
T 169
T 179
Legend
U.S. and Minnesota Highways
County State Aid Highways
County, Township, and Local Roads
Railroads
Streams
Lakes
State Parks
Counties
Municipalities
N
0 1 2 3 4 5 Miles
Source: Minnesota Department of Transportation

14 West Interregional Corridor:
North Mankato to New Ulm

Figure 5.1-3
Roadway Location Alternative Segments

May 2003

Courtland/Top of Bluff Alignment

Courtland/Hilltop Alignment

Hwy 21 Alignment

River Valley Alignment

Hwy 14/15 Top of Bluff Alignment

Hwy 14/15/37 Alignment

Courtland Southern Bypass

Courtland Northern Bypass # 2

Courtland Northern Bypass # 1

Courtland - Nicollet Bypass Connection

Hwy 25 Alignment

Hwy 68 Alignment

Nicollet Northern Bypass

Nicollet Southern Bypass #1

Nicollet Southern Bypass # 2

Existing Alignment

Nicollet County

Brown County

Courtland

New Ulm

Nicollet

North Manka

MIDDLE LAKE

SWAN LAKE

MINNESOTA RIVER

T 150

T 169

T 166

T 179

Legend

- Project Corridor
- U.S. and Minnesota Highways
- County State Aid Highways
- County, Township, and Local Roads
- Railroads
- Streams
- Lakes
- State Parks
- Counties
- Municipalities

N

0 1 2 3 4 5 Miles

Source: Minnesota Department of Transportation

Minnesota Department of Transportation — Moving Minnesota

14 West Interregional Corridor:
North Mankato to New Ulm

Figure 5.1-4
Universe of Alignment Alternatives

Segment 1 – TH 15/CSAH 21 to T 150

Deficiencies within Segment 1 included safety, future year operations, existing and future traffic mobility, access spacing, risk for future traffic signals, limited no passing lanes, and roadway geometry. A majority of deficiencies relate to the intersection of TH 14/TH 15/CSAH 21. The intersection currently is experiencing safety deficiencies, and is expected to perform below the operational goals for the corridor by Year 2025. In addition, this intersection is at risk of traffic signal installation in the future.

The Thru-STOP condition at this intersection forces traffic traveling west on TH 14 to come to a complete stop at the intersection and make a left turn to continue along the route even though it carries the highest volume of vehicular traffic. East bound traffic on TH 14 has a free-right turn and slows to 15 mph to make the turn. Except for the four-lane design on existing alignment, all location alternatives for this segment make TH 14 the through movement. Because of the unique configuration of this intersection, the connections of TH 15 and CSAH 21 will require realignment, construction of frontage roads, additional roadway structures, or a combination of these in order to meet the desired one-mile access spacing as defined on **Table 4.1-5**. Location alternatives for Segment 1 are shown on **Figure 5.1-5** and include alignments to allow improvements to this intersection. Descriptions of the alternatives are as follows:

- **Existing Alignment (B)** – The existing alignment of TH 14 is located between the Minnesota River and the bluff and maintains the Thru-STOP movement for TH 14. It provides limited space for improvements to the intersection of TH 14/TH 15/CSAH 21.
- **River Valley Alignment (N1)** – This alignment is located on the existing TH 14 roadway connecting both legs of TH 14 with a 60 mph horizontal design curve making TH 14 the through movement. TH 15 can be connected to new TH 14 with either an at-grade intersection or an interchange.
- **Hwy 14/15 Top of the Bluff Alignment (N2)** – This alignment is located just east and on top of the Minnesota River Bluff, leaving the existing alignment just west of the intersection of TH 14/CSAH 37. Since this alternative is above the bluff line, more right-of-way is available for intersection improvements.
- **Hwy 14/15/37 Top of the Bluff Alignment (N3)** – This alternative is located just east and parallel to the existing alignment on the top of the Minnesota River Bluff. The realignment begins about 4,000 feet east of the TH 14/CSAH 37 intersection, and connects with the existing TH 14/TH 15 Minnesota River Bridge. The CSAH 37 Corridor can be extended to meet the new alignment at a location further east. Since this alternative is above the bluff line, more right-of-way is available for intersection improvements.
- **Courtland/Top of the Bluff Alignment (N4)** – This location alternative moves TH 14 to a new alignment just above the bluff line from the intersection of TH 14/TH 15/CSAH 21 to the City of Courtland where it connects with the Courtland northern bypass alternatives. CSAH 37 can be extended to meet the new alignment at a location further east. Since this alternative is above the bluff line, more right-of-way is available for intersection improvements.

May 2003

New Ulm

MINNESOTA 15

MINNESOTA 68

14

River Valley Alignment

Hwy 14/15 Top of Bluff Alignment

Hwy 14/15/37 Alignment

Existing Alignment

Courtland/Hilltop Alignment

Courtland/Top of Bluff Alignment

Hwy 21 Alignment

21

37

12

T 150

Courtl

14

Legend

- Project Corridor
- U.S. and Minnesota Highways
- County State Aid Highways
- County, Township, and Local Roads
- Railroads
- Streams
- Lakes
- State Parks
- Counties
- Municipalities

N

0 0.5 1 1.5 2 Miles

Source: Minnesota Department of Transportation

Moving Minnesota

14 West Interregional Corridor:
North Mankato to New Ulm

Figure 5.1-5
Segment 1 - Universe of Alignment Alternatives

- **Hwy 21 Alignment (N5)** – This alternative follows the CSAH 21 alignment, bypassing the City of Courtland. The western connection of the alternative connects with TH 15 at a location further north, relocating the TH 14/TH 15/CSAH 21 intersection to an area above the bluff line, creating additional available right-of-way for intersection improvements.
- **Courtland/Hilltop Alignment (N6)** – This alternative is on new alignment, going north from the northern bypass alternative within the City of Courtland on a half section line and connecting to TH 15 north of existing CSAH 21. Since this alternative is above the bluff line, more right-of-way is available for intersection improvements.

Segment 2 –T 150 to T 166

Most of the deficiencies in Segment 2 are located within the City of Courtland, including future congestion, existing and future mobility, access spacing, moderate risk of meeting traffic volume guidelines for signal installation at county highway intersections by Year 2025, and geometric deficiencies. Findings for this segment include:

- There is a high percentage of no passing zones just west of the City of Courtland.
- The results of the origin-destination study show that 50 percent of the traffic on the TH 14 Corridor traveled through the Cities of Courtland and Nicollet, indicating that a bypass of Courtland would be economically feasible.
- The City of Courtland is in support of the realignment of the TH 14 Corridor.

For these reasons, the alternatives for this segment include bypasses of the City of Courtland. Location alternatives for Segment 2 are shown on **Figure 5.1-6** and descriptions are as follows:

- **Existing Alignment (B)** – The existing TH 14 alignment is located in the heart of the City of Courtland, separating residential housing on the north from the commercial property on the south.
- **Courtland Northern Bypass #1 (N1)** – This alternative relocates the TH 14 roadway approximately one-quarter to one-half mile north of existing TH 14 between T 150 and CSAH 21, following the bluff line within the City limits of Courtland. This bypass location was identified in the City of Courtland Comprehensive Plan, 1999.
- **Courtland Northern Bypass #2 (N2)** – This alternative is located along the northern city limits of Courtland approximately one mile north of existing TH 14 from T 150 to just west of CSAH 21. This is approximately a half-mile north of Northern Bypass #1.
- **Hwy 21 Alignment (N3)** – This alternative follows the CSAH 21 alignment, bypassing the City of Courtland. The western connection of the alternative connects with TH 15 at a location north of the existing connection, relocating the TH 14/TH 15/CSAH 21 intersection to an area above the bluff line.
- **Courtland Southern Bypass (S)** – This alternative realigns the roadway south of existing TH 14 from T 150 to just east of CSAH 21 as a southern bypass of

May 2003

Courtland/Hilltop Alignment

Hwy 21 Alignment

Existing Alignment

Courtland Northern Bypass # 1

Courtland Northern Bypass # 2

Courtland Southern Bypass

Hwy 68 Alignment

Courtland - Nicollet Bypass Connection

Hwy 25 Alignment

21

12

37

14

24

25

T 150

T 166

SWAN LAKE

MINNESOTA RIVER

MINNESOTA 68

Legend

- Project Corridor
- U.S. and Minnesota Highways
- County State Aid Highways
- County, Township, and Local Roads
- Railroads
- Streams
- Lakes
- State Parks
- Counties
- Municipalities

N

0 0.5 1 1.5 2 2.5 Miles

Source: Minnesota Department of Transportation

Moving Minnesota

14 West Interregional Corridor:
North Mankato to New Ulm

Figure 5.1-6
Segment 2 - Universe of Alignment Alternatives

Courtland. The alignment is located along the top of the ridge between the commercial/industrial area to the north and the residential section to the south.

Segment 3 – T 166 to CSAH 6

Deficiencies in Segment 3 are located in the City of Nicollet, and include existing and future level-of-service, intersection safety, existing and future mobility, access, limited passing zones, risk of an intersection meeting one or more traffic signal warrants by Year 2025, and geometric deficiencies. The City of Nicollet is concerned about safety at the intersection of TH 14/TH 11/CSAH 23 because a fatal accident occurred there in 2001. The City of Nicollet has indicated support for a south realignment of the TH 14 Corridor to allow for future development to the south of present TH 14. The origin-destination study indicated about half of the vehicles traveling along this Corridor do not have an origin or destination within the City of Courtland or Nicollet but rather pass through the cities. Therefore, the alternatives for Segment 3 include alignments bypassing the City of Nicollet. Location alternatives for Segment 3 are shown on **Figure 5.1-7** and descriptions are as follows:

- **Existing Alignment (B)** – The existing TH 14 alignment connects to TH 111 and TH 99 within the southern portion of Nicollet.
- **Nicollet Northern Bypass (N)** – The northern bypass of Nicollet is realigned from T 169 on the west to T 179 to the east, along the northern city limit of Nicollet.
- **Nicollet Southern Bypass #1 (S1)** – This bypass is located on the south edge of the City of Nicollet, allowing ample room for expansion of the sewer treatment ponds. The alignment is less than ½ mile south of the existing alignment.
- **Nicollet Southern Bypass #2 (S2)** – This alternative is about 1½ mile south of the existing alignment, allowing land for additional growth south of the existing Nicollet city limits.
- **Courtland – Nicollet Southern Bypass Connection (S3)** – If a south bypass alignment was determined to be the best alternative for both the Cities of Courtland and Nicollet, this alternative would connect the two without reconnecting to the existing TH 14 alignment between the two cities. The alignment was developed on half section lines as to avoid possible access management issues.
- **Hwy 25 Alignment (S4)** – This alternative bypasses Nicollet by using the existing CSAH 25 Corridor.

Additional Alternatives

During the public involvement process, interest was expressed in using the TH 68 Corridor as the main east-west route from New Ulm to Mankato. TH 68 is located south of the Minnesota River, running parallel to TH 14.

May 2003

Nicollet Northern Bypass

MIDDLE LAKE

SWAN LAKE

Nicollet Southern Bypass #1

Nicollet

MINNESOTA 111

MINNESOTA 99

21

72

T 179

T 169

Existing Alignment

23

25

T 166

17

Hwy 25 Alignment

Courtland Southern Bypass

Courtland - Nicollet Bypass Connection

14

Nicollet Southern Bypass # 2

Hwy 68 Alignment

25

6

77

6

41

Legend

- Project Corridor
- U.S. and Minnesota Highways
- County State Aid Highways
- County, Township, and Local Roads
- Railroads
- Streams
- Lakes
- State Parks
- Counties
- Municipalities

N

0 0.5 1 1.5 2 2.5 Miles

Source: Minnesota Department of Transportation

Minnesota Department of Transportation — Moving Minnesota

14 West Interregional Corridor:
North Mankato to New Ulm

Figure 5.1-7
Segment 3 - Universe of Alignment Alternatives

5.2 EVALUATION OF ALTERNATIVES

At the beginning of the study process, the Advisory Committee developed a list of goals and objectives for the TH 14 Corridor. Some of these goals and objectives were formed using guidance from *Mn/DOT's Interregional Corridor: A Guide for Plan Development and Corridor Management*, while other goals were developed to meet the distinctive needs of the corridor. In order to determine alternatives that best meet the needs in the TH 14 Corridor, each alternative was screened using evaluation criteria developed from the goals and objectives listed in Chapter 1. The goals for the corridor are as follows:

- **Goal 1: Safety** - ***Provide safe operating conditions throughout the corridor consistent with Mn/DOT guidelines.***
- **Goal 2: Mobility** - ***Provide level of mobility consistent with the functional classification of the roadway and Mn/DOT's IRC performance target.***
- **Goal 3: Environmental** – ***Preserve key environmental resources in the corridor.***
- **Goal 4: Social** – ***Maintain consistency with local land use plans.***
- **Goal 5: Economic**– ***Support economic vitality in the corridor and region.***

5.2.1 Description of Evaluation Criteria/Measures of Effectives

Alternatives for the TH 14 Corridor were evaluated in a two-step screening process. First the design alternatives were evaluated to determine which roadway section would best serve the level of traffic operation and mobility as defined in *Mn/DOT's Interregional Corridor Guidance*. The criteria are as follows:

- Maintain a level-of-service at or above the C-D boundary.
- Meet Mn/DOT's IRC mobility performance target for medium priority corridors of maintaining an average speed of over 55 mph.

Second, location alternatives were evaluated. The evaluation criteria were developed, using specific objectives to support the five goals listed above, as follows:

Safety

- Existing Segment Crash Rate – Expected impact on crash rates for the segment using Mn/DOT statewide averages.
- Existing Intersection Crash Rate – Expected impact on crash rates for intersection within the segment as compared to Mn/DOT statewide averages for similar intersections.

Mobility

- Segment LOS – Ability of the segment to achieve Mn/DOT's goal of the LOS C/D Boundary in the existing and future years.
- Intersection LOS – Ability of the intersections within the segment to achieve Mn/DOT's goal of the LOS C/D Boundary in the existing and future years.
- Mobility – Ability of the segment to meet Mn/DOT's IRC goal of average speeds above 55 miles per hour through the segment for existing and future years.
- Signal Proliferation – The potential for an intersection within the segment to meet traffic signal warrants by Year 2025.

Access Management

- Mn/DOT Access Averages – Capability of the alternative to be below Mn/DOT's average of 8 accesses per mile in rural areas and 28 accesses per mile in urban areas.
- IRC Access Management Guidelines – Ability of the alternative to follow Mn/DOT's intersection spacing guidelines for medium priority interregional corridors.

Environmental Impacts

- Wetlands – Assessment of potential for impacts to wetlands identified on the National Wetland Inventory.
- Public Waters – Assessment of potential for impacts to water resources meeting the definition of Public Waters according to the MN DNR.
- Threatened & Endangered Species, Rare Natural Features, Biodiversity – Assessment of potential for impacts to ecological resources identified by the MN DNR.
- Parks and Wildlife Management Areas – Assessment of potential impacts to recreation areas identified in city planning documents and MN DNR databases.
- Noise – Assessment of potential for impacts to significant numbers of noise receptors.

Cultural Resource Impacts

- Historical – Review of MnModel database to determine potential for impacts to NRHP buildings/districts.
- Archeological – Review of MnModel database to determine potential for archaeological sites.
- Cemeteries – Assessment of potential to impact active and inactive cemetery sites.

Visual

- Scenic Views – Assessment of potential to impact scenic Minnesota River Valley views.

Economic and Social

- Consistency with Local Land Use Plans – Assessment of coordination with cities planning documentation.
- Community Qualities – Assessment of consistency with community qualities.
- Economic Development – Ability for reliable travel for freight haulers.

Right-of-Way

- Number of Parcels Impacted – Assessment of quantity of parcels impacted.

- Total Right-of-way Acquisition – Assessment of quantity of total property acquisition.

5.2.2 Design Alternative Evaluation

This section documents the analysis of each of the design alternatives.

Alternative A: Improved Two-Lane Rural Roadway

The improved two-lane rural section is *not recommended for further study*. This design alternative does not address the primary deficiencies of safety and traffic operations along the TH 14 roadway. A two-lane design does not meet the purpose and need for the project because it does not meet the mobility objectives with the forecast traffic volumes.

For example, with the No-Build Alternative the future LOS for TH 14 using future traffic volumes and existing roadway geometry is LOS "E". The future LOS for TH 14 using future traffic volumes and decreasing the no-passing zones to meet Mn/DOT's recommended levels would still be LOS "E". Therefore, an improved two-lane roadway on new alignment would also operate at a LOS "E" and fails to meet the mobility objectives for the corridor. See **Section 4.1.2** for more details.

Alternative B: Four-Lane Urban Roadway

The four-lane urban roadway design is *recommended for further study* for the existing TH 14 alignment through the Cities of Nicollet and Courtland. This alternative is consistent with the purpose and need for the project, addresses safety and operational deficiencies, and would reduce environmental effects and right-of-way acquisition compared to the width of a four-lane rural design. This four-lane design would be appropriate for the existing alignment through the Cities of Courtland and Nicollet, but not in the rural areas where a curb, gutter, and enclosed drainage system design would not be needed and would increase construction costs.

Alternative C: Four-Lane Rural Roadway

The four-lane rural roadway design is *recommended for further study*. This alternative is consistent with the purpose and need for the project, addresses safety and operational deficiencies, best addresses mobility goals for the corridor, and is consistent with Mn/DOT's long-range plan for the roadway, although it has the potential for the greatest environmental impacts because of the right-of-way width.

5.2.3 Location Alternative Evaluation

This section documents the analysis of each of the location alternatives. **Table 5.2-1** shows the rating of each alternative for each of the measures of effectiveness as defined in **Section 5.2.1**. Discussion of the evaluation by segment for each location alternative follows.

Table 5.2-1
Evaluation of Alternatives

Alternatives			Measures of Effectiveness																								
			Traffic Safety		*Mobility and Traffic Operations*							*Access Management*		*Environmental Impacts*					*Cultural Impacts*			*Visual*	*Economic and Social*			*Right-of-Way*	
Segment	**Alternative Code**	**Alternative Description**	**Existing Segment Crash Rate**	**Existing Intersection Crash Rate**	**Existing Segment LOS**	**Future Segment LOS**	**Existing Intersection LOS**	**Future Intersection LOS**	**Existing Mobility Meets Goals**	**Future Mobility Meets Goals**	**Risk for Signal Proliferation**	**Meets MnDOT Access Averages**	**Meets IRC Access Management Guidelines**	**Wetlands**	**Public Waters**	**T & E Species, Rare Natural Features, Biodiversity**	**Parks and Wildlife Management Areas**	**Noise**	**Historical**	**Archeological**	**Cemetery**	**Scenic Views**	**Consistent with Local Land Use Plans**	**Consistent with Community Qualities**	**Supports Economic Development**	**Number of Parcels Impacted**	**Total Takes**
TH 15/CSAH 21 to T 150	I	Existing Alignment	1.4	1.5	A	A/B	A	F	Yes	No	High	Yes	No	Moderate	Low / Moderate	Moderate	Low	Low	Moderate	Moderate	Low	High	- -	- -	- -	NA	NA
	IN1	Hwy 14/15/37 Realignment	-35%	-70%	A	A	A	A	Yes	Yes	Low	Yes	Yes	Low	Moderate	Low / Moderate	Low	Low	Low	Moderate	Low	High	- -	Yes	Yes	6	High
	IN2	Courtland/Hilltop Alignment	-35%	-70%	A	A	A	A	Yes	Yes	Low	Yes	Yes	Moderate	Moderate	Low / Moderate	Low	Low	Low	Moderate	Low	Low	- -	Yes	Maybe	6	High
	IN3	Hwy 21 Alignment	-35%	-70%	A	A	A	A	Yes	Yes	Low	Maybe	Maybe	Moderate	Moderate	Low	Low	Low	Low	Moderate	Low	Low	- -	Yes	Maybe	1	Low
T 150 to T 166	C	Existing Alignment	1.1	- -	A	A	A	A	Yes	No	Moderate	No	No	Low	Low / Moderate	Low	Moderate	High	High	Moderate	Moderate	Moderate	No	No	No	NA	NA
	CN1	Courtland Northern Bypass #1	-15%	- -	A	A	A	A	Yes	Yes	Low	Yes	Yes	Low	Low	Low	Low	Moderate	Low	Moderate	High	Low	Yes	Yes	Yes	1	Moderate
	CN2	Courthland Northern Bypass #2	-15%	- -	A	A	A	A	Yes	Yes	Low	Yes	Yes	Low	Low	Low	Low	Moderate	Low	Moderate	Low	Low	Maybe	Yes	Yes	1	Moderate
	CN3	Hwy 21 Alignment	-15%	- -	A	A	A	A	Yes	Yes	Low	Maybe	Maybe	Low	Low	Low	Low	Low	Low	Moderate	Low	Low	No	No	Maybe	1	Low
	CS	Courthland Southern Bypass	-15%	- -	A	A	A	A	Yes	Yes	Low	Yes	Yes	Low / Moderate	Low	Low/Moderate	Low	High	Low	Moderate	Low	High	No	No	Yes	2	Moderate
T 166 to CSAH 6	N	Existing Alignment	0.7	1.1	A	B	A	C	Yes	No	High	No	No	Low	Moderate/ High	Low	High	High	Low / Moderate	Moderate	Low	Low	No	No	No	NA	NA
	NN	Nicollet Northern Bypass	Unch.	-60%	A	A	A	B	Yes	Yes	Moderate	Yes	Yes	Low / Moderate	Moderate/ High	Low	Low	Moderate	Low	Moderate	Low	Low	No	No	Maybe	1	Low
	NS1	Nicollet Southern Bypass #1	Unch.	-60%	A	A	A	B	Yes	Yes	Moderate	Yes	Yes	Low	Low	Low	Low	Moderate	Low	Moderate	Low	Yes	Maybe	Yes	Yes	0	Moderate
	NS2	Nicollet Southern Bypass #2	Unch.	-60%	A	A	A	B	Yes	Yes	Moderate	Yes	Yes	Low / Moderate	Moderate/ High	Low	Low	Low	Low	Moderate	Low	Yes	Yes	Maybe	Maybe	1	Moderate
	NS3	Courtland - Nicollet Southern Bypass Connection	Unch.	-60%	A	A	A	B	Yes	Yes	Moderate	Yes	Yes	Low / Moderate	Moderate	Low	Low	Low	Low	Moderate	Low	Yes	Maybe	Maybe	Maybe	3	High
	NS4	Hwy 25 Alignment	Unch.	-60%	A	A	A	B	Yes	Yes	Moderate	Maybe	Maybe	Low	Moderate	Moderate	Low	Low	Moderate	Moderate	High	Yes	Maybe	Maybe	Maybe	0	Low

Source: Howard R. Green Company

02/21/03

Segment 1 - TH 15/CSAH 21 to T 150

- Traffic Safety – Crash and severity rates at the intersection of TH 14/TH 15 /CSAH 21 are higher than expected. TH 14 currently has, and is expected in the future to have, higher vehicular traffic volumes than TH 15; therefore, the existing Thru-STOP condition violates motorists' expectations. The **Existing Alignment** is the only alternative that does not make TH 14 the through movement; therefore, with any of the new alignments, the crash rate would be expected to drop by about 70 percent at the intersection of TH 14/TH 15/CSAH 21.

- Mobility and Traffic Operations – In the previous design alternative analysis, a two-lane facility was not recommended due to its inability to meet the operational goals for the corridor. As a four-lane expressway, the TH 14 Corridor would be expected to have a LOS A/B in future years. The **Existing Alignment** is not expected to meet the future mobility needs of the corridor because of the expected increase in delay caused by TH 14 being forced to stop at the intersection of TH 14/TH 15/CSAH 21, while in all the other alternatives, TH 14 is designed to be the through movement. It should be noted that traffic volumes are not expected to change significantly with the new alignments; therefore all alignments are at risk for signalization. The five alternatives; **Hwy 14/15 Top of the Bluff Alignment**, **Hwy 14/15/37 Top of the Bluff Alignment**, **Courtland/Top of the Bluff Alignment**, **Hwy 21 Alignment**, and **Courtland/Hilltop Alignment** move the TH 14/TH 15/CSAH 21 intersection to the east above the Minnesota River Bluff, allowing additional right-of-way for intersection improvements to assist in achieving Mn/DOT's mobility goals.

- Access Management – Access spacing along the **Existing Alignment** currently falls below Mn/DOT's average access of eight accesses per mile in rural areas, but it fails to meet IRC Access Management Guidelines. Since **Hwy 21 Alignment** is an existing road, access may be an issue because of existing residential access to the corridor, but access could be resolved through the use of frontage roads. All new alignments would be designed following Mn/DOT's access guidelines; but because of the unique configuration of the TH 14/TH 15/CSAH 21 intersection, the connections of TH 15 and CSAH 21 will require realignment, construction of frontage roads, additional roadway structures, or a combination of these measures.

- Environmental Impacts – All alternatives have moderate environmental impacts, including wetlands, public waters, and Threatened & Endangered species, rare natural features, and biodiversity.

- Cultural Resource Impacts – The **Existing Alignment** and the **River Valley Alignment** have moderate impacts to historical sites, and all alternatives have a moderate impact to archeological sites.

- Visual – The **Existing Alignment** and the **River Valley Alignment** provide scenic views because of their proximity to the Minnesota River.

- Economic and Social – Since Segment 1 is not located within any city boundaries, no land use plan for this corridor exists. The major concern for this segment during the public involvement process was the impact of the roadway on mobility for the trucking industry with a focus on the intersection of TH 14/TH 15/CSAH 21. In addition, a truck survey completed by the Region Nine Development Commission supported the importance of the connection of TH 14 and TH 15. Currently, unloaded truck traffic uses CSAH 37 to bypass the City of New Ulm, making this vital economic connection. While all the realignment alternatives allow for intersection improvements, the **Hwy 21 Alignment** and the **Courtland/Hilltop Alignment** have the least amount of connectivity with CSAH 37.

- Right-of-Way – Widening existing corridors as in the **Existing Alignment**, the **River Valley**, and the **Hwy 21 Alignment** would result in a small amount of right-of-way acquisition. Any alternative on new alignment (**Hwy 14/15 Top of the Bluff Alignment**, **Hwy 14/15/37 Top of the Bluff Alignment**, **Courtland/Top of the Bluff Alignment**, and **Courtland/Hilltop Alignment**) would require a substantial amount of acquisition in undeveloped areas.

Segment 2 –Courtland, T 150 to T 166

- Traffic Safety – None of the intersections or the overall segment is experiencing crash rates above the critical rate throughout this segment. If the TH 14 Corridor was improved to a four-lane expressway, the crash rate is expected to drop by about 15 percent.

- Mobility and Traffic Operations – In the previous design alternative analysis, a two-lane facility was not recommended due to its inability to meet the operational goals for the corridor. As a four-lane expressway, the TH 14 Corridor would be expected to have a LOS A in future years. The **Existing Alignment** is not expected to meet the future mobility needs of the corridor because of the reduced speed within the City of Courtland.

- Access Management – Access spacing along the **Existing Alignment** is well above Mn/DOT's average of 28 accesses per mile in urbanized areas, and does not meet IRC Access Management Guidelines. Access management strategies within this segment are limited due to a lack of a supporting road network within the City of Courtland and the proximity of the development to TH 14. New alignments: the **Courtland Northern Bypass #1,** the **Courtland Northern Bypass #2**, and the **Courtland Southern Bypass** would be designed with limited access when constructed. Since the **Hwy 21 Alignment** is an existing road, access may be an issue because of existing residential access to the corridor.

- Environmental Impacts – A high risk for noise impacts exists with the **Existing Alignment** and the **Courtland Southern Bypass** because of their proximity to residential housing.

- Cultural Resource Impacts –The **Existing Alignment** has a high risk of impacts to historical sites and a moderate risk of impacts to a cemetery, and all alternatives have a

moderate risk to impact archeological sites. The **Courtland Northern Bypass #1** which follows the City of Courtland's Comprehensive Plan, has a high risk of impacting a cemetery.

- Visual – The **Existing Alignment** and **Courtland Southern Bypass** provide scenic views because of their proximity to the Minnesota River.

- Economic and Social – The **Courtland Northern Bypass #1** is consistent with the City of Courtland's Comprehensive Plan and community qualities, while the City has also shown support for the **Courtland Northern Bypass #2**. The **Existing Alignment** currently is located in downtown Courtland near residential development. In addition, the City's future planning indicates more development surrounding the existing alignment on the west end of town. The **Courtland Southern Bypass** divides the residential housing to the south from the City's commercial development. The City of Courtland has indicated the distance of the **Hwy 21 Alignment** from the City is too far to support economic development within the City.

- Right-of-Way – Widening existing corridors as in the **Existing Alignment** and the **Hwy 21 Alignment** would require a small amount of right-of-way acquisition although it would be expensive because of impacts to existing development. Any alternative on new alignment (**Courtland Northern Bypass #1**, **Courtland Northern Bypass #2**, and **Courtland Southern Bypass**) would require a substantial amount of right-of-way acquisition.

Segment 3 – Nicollet, T 166 to CSAH 6

- Traffic Safety – Although the existing segment crash rate is below the expected rate, the crash rate at the intersection of TH 14/TH 111/CSAH 23 may see reductions of nearly 60 percent if moved to a new alignment.

- Mobility and Traffic Operations – The existing and future segment and intersection LOS meets Mn/DOT's goals for this corridor. Nevertheless, the intersection of TH 14/TH 111/CSAH 23 is at high risk for meeting two or more traffic signal warrants by the Year 2025, causing an expected reduction in the overall mobility of the corridor. Each of the bypass alternatives relocates this intersection out of town, but traffic on TH 111 is not expected to decrease significantly; therefore the new alignment would still be at risk for signalization.

- Access Management – Access spacing along the **Existing Alignment** does not currently meet IRC Access Management Guidelines. Direct access to residential housing makes managing access difficult. New alignments **Nicollet Northern Bypass**, the **Nicollet Southern Bypass #1**, the **Nicollet Southern Bypass #2**, and the **Courtland – Nicollet Southern Bypass Connection** were placed on half section lines where no existing access exists, and access would be limited when constructed. Since the **Hwy 25 Alignment** is an existing road, access maybe an issue because of existing residential access to the corridor.

- Environmental Impacts – All alternatives (with the exception of the **Nicollet Southern Bypass #2**) have a moderate or high risk of impact to public waters. Alignments closest to Nicollet (**Existing Alignment**, the **Nicollet Northern Bypass**, and the **Nicollet Southern Bypass #1**) have the highest risk of noise impacts to local residents.

- Cultural Resource Impacts – All alignments have a moderate risk of impacting archeological sites. The **Hwy 25 Alignment** has additional cultural resource impacts including cemeteries and historical sites.

- Visual – The **Courtland – Nicollet Southern Bypass Connection** and the **Hwy 25 Alignment** provide scenic views because of their proximity to the Minnesota River.

- Economic and Social – Future plans within the City of Nicollet have indicated most growth to the north and southwest. In addition to dividing the southwest development from the City's core, the **Existing Alignment** also parallels residential development on both the north and south. The City of Nicollet has expressed interest in relocating the TH 14 Corridor to the south to improve the quality of their community. All four south alternatives are consistent with the City of Nicollet's development plans, but the **Nicollet Southern Bypass #1** is viewed by the community as the best economic alternative for the City as it provides the least inconvenience for commuters and still attracts travelers to local businesses.

- Right-of-Way – Widening existing corridors as in the **Existing Alignment** and the **Hwy 25 Alignment** would require a small amount of right-of-way acquisition, although it would be expensive because of impacts to existing development. Any alternative on new alignment (**Nicollet Northern Bypass**, **Nicollet Southern Bypass #1**, **Nicollet Southern Bypass #2**, and **Courtland – Nicollet Southern Bypass Connection**) would require a significant amount of acquisition. Since the **Courtland – Nicollet Southern Bypass Connection** is completely on new alignment from Nicollet to Courtland, it would result in the largest amount of right-of-way acquisition.

TH 68 Alternative

- Traffic Safety – The existing crash rates along this corridor have not been analyzed.

- Mobility and Traffic Operations – The TH 68 Alternative would be expected to operate at a LOS A in the existing and future year traffic conditions. The low volume of traffic is one of the reasons it is a known bicycle route.

- Access Management – Since *TH 68* is an existing road, access maybe an issue because of existing access to the corridor.

- Environmental Impacts – Widening of TH 68 would risk impacts to wetlands, public waters, and Threatened & Endangered species, rare natural features, and biodiversity.

- Cultural Resource Impacts – Improvements to TH 68 may have moderate impacts to historical and archeological sites.

- Visual – TH 68 provides a scenic view, which is one of the reasons it is a known bicycle route.

- Economic and Social – TH 68 is not consistent with any local land use plans. The distance of the corridor from the Cities of Nicollet and Courtland would limit their potential for commercial development and economic growth. Trucking companies within the region would face additional economic impacts. According to a survey completed by the Region Nine Development Commission, TH 68 is not a preferred route.

- Right-of-Way – TH 68 would require a substantial amount of cut and fill because of the geography of the area. In addition, improvements would also need to be made to connect the corridor with TH 111 as required by the Constitutional Trunk Highway Routes.

5.3 ACCESS MANAGEMENT PLAN

The range of improvements represented by the universe of alternatives indicates that TH 14 would be classified as a Category 2A according to Mn/DOT's Access Spacing Guidelines (March 2002) and outlined in Section 4.1.3 of this CMP. A Category 2A is a Rural/Exurban and Bypass facility for Medium Priority Interregional Corridors. Upon completion of the improvements, the goals for this category suggest an access management strategy consisting of:

- No private accesses (private access by special exception only)
- Primary/full movement intersections spaced at one mile intervals
- Right-In/Right-Out and ¾ Access intersections at half-mile intervals
- Traffic signals are strongly discouraged (allowed only under limited circumstances)

Access management strategies to remove private access to TH 14 would range from diverting driveways off of TH 14 to providing new frontage roads and local roadways to support shorter trips for local circulation.

In order to achieve the one-mile spacing goal along the 22-mile corridor, it is suggested to have an access budget of no more than 22 full access intersections. These intersections would only be public roadways and would give the highest priority first to Trunk Highways, then County State Aid Highways, other County Roads, and possibly some city streets/township roads.

With an access budget of 22 accesses for the corridor, the following roadways would be given the highest priority for access to TH 14:

- TH 15/CSAH 21
- CSAH 37
- Bypass connection west of Courtland
- CSAH 12/CSAH 24
- Bypass connection east of Courtland
- CSAH 11
- Bypass connection west of Nicollet
- TH 111/CSAH 23
- Bypass connection east of Nicollet
- CSAH 25 or CSAH 17/CR 77
- CSAH 6

This leaves a balance of 11 additional full access intersections that, if they are needed, can be spaced at one-mile spacing along the roadway.

In between the full access locations spaced one mile apart, there is an opportunity for limited access to other public roads. The movements at these intersections would be restricted to right-in/right-out or ¾ access through the use of medians on TH 14.

A review of current and forecast future traffic volumes indicates that there are three intersections that would likely meet the guidelines for the installation of traffic signals in the near future. They are:

- TH 14/TH 15/CSAH 21
- TH 14/CSAH 37
- TH 14/TH 111/CSAH 23

Because of the desire to restrict and/or eliminate the use of signals on high-speed rural roadways, such as TH 14, these intersections would be candidates for grade-separated interchanges.

In addition to the above, other grade-separated crossings of TH 14 could be considered. This would allow for local circulation that would not conflict with the through movements on TH 14.