Chapter 6 Alignment Selection

6.1 Issues and Deficiencies

Based on the evaluation of the existing conditions of US 93 within the study area, roadway issues and deficiencies were identified if they did not meet current MDT design standards. Design standards that were not met included alignment geometry, roadway surface width, and higher crash trends compared to similar routes statewide. Additionally, the number of access points along US 93 is less than desirable. The identified roadway issues are presented below.

6.1.1 Vertical Alignment

The vertical alignment of US 93 does not meet current design standards at five locations. These include:

1. From RP 57.2 to 57.8, the northbound grade goes from 5.9% to 5.7%, respectively. The nearly 6% grade exceeds the maximum allowable grade of 4% for a 60 mph rural design speed in rolling terrain. **A design exception was approved for this grade in April 2004.**

2. From RP 57.2 to 57.7, the southbound grade is 5.5% which exceeds the maximum grade of 4% recommended for a 60 mph rural design speed in rolling terrain. **A design exception was approved for this grade in April 2004.**

3. At RP 57.7, the vertical sag curve k-value of 130.15 does not meet the minimum k-value of 136. **A design exception was approved for this grade in December 2010.**

4. At RP 62.5, the grade of 4.8% exceeds the maximum grade of 4% recommended for a 60 mph rural design speed in rolling terrain. This section of roadway along US 93 was constructed to design standards in 1955. However, these design standards have changed since 1955; therefore, the vertical alignment does not meet current design criteria.

5. At RP 62.5, the vertical sag curve k-value of 128.81 does not meet the minimum k-value of 136.

The length and steepness of grades directly affects the operational characteristics of the roadway.

6.1.2 Roadway Surface Width

The existing roadway surface width throughout the study area varies from 28 feet to 71 feet. The varying width does not meet the suggested surface width for US 93. According to the MDT NHS Route Segment Map reference, the suggested roadway surface width for US 93 is 40 feet or greater. However, the Route Segment Plan no longer defines a standard roadway width. The MDT Roadway Width Committee would determine the appropriate width during future project development. Due to certain constraints, the Route Segment Plan does not extend into urban areas. Therefore, the section from RP 60.851 to 63.0 does not meet the current suggested surface width of 40 or greater.

6.1.3 Crash Trends

Safety concerns were documented along the existing US 93 route through an evaluation of crash rates for the rural and urban-like portions of the roadway, and compared to statewide averages for roadways of similar type (see section 2.11). For the "rural" segments of US 93, the crash rate for all vehicles is higher than the average comparable rural routes throughout the state of Montana for the same analysis period. These "rural" segments include the southern portion of US 93, between Caffrey Road and MT-35 (all vehicle crash rate of 1.58), and the northern portion of US 93 between Irvine Flats Road and RP 65 (all vehicle crash rate of 1.32). The average comparable all vehicle crash rate for rural routes statewide is 1.07. The section of US 93 between MT-35 and Irvine Flats Road exhibits "urban" characteristics, and therefore the all vehicle crash rate was compared to the average comparable all vehicle crash rate for urban routes throughout the state of Montana for the same analysis period. The "urban" segment of US 93 all vehicle crash rate of 2.33 was much less that the average comparable statewide urban route all vehicle crash rate of 5.06.

6.2 Alignment Selection Development

Potential alternate alignments for US 93 were evaluated by reviewing all existing engineering and environmental resource information and soliciting input from the community, stakeholders, and resource agencies. As previously described in Chapter 5, eleven potential alignments were established to address the needs and objectives for the US 93 corridor. These alignments are recognized as various alternate routes that have the potential to be developed to satisfy the long-term needs of US 93. The development and locations of the potential alignments are best considered in terms of general corridor “swaths”. Exact centerline locations are not known at this time, so “swaths” represent approximate locations of potential alignment options.

Screening criteria were developed to assist in the evaluation of the potential alignments of US 93 between RP 56.5 and RP 63.0. Screening criteria provide a means of reducing the range of potential alignments for consideration by comparing them both quantitatively and qualitatively with a set of specific measures. The screening process was a high level evaluation that was utilized to identify alignment options that satisfied the needs and objectives laid forth previously, and subsequently could be carried forward for further consideration if a project moves forward.

The screening process described in the following section illustrates each alignment’s ability to meet the screening criteria and each alignment’s respective scoring.

6.3 Screening Process

In this screening process, rating factors were developed. Low, medium and high rating factors were assigned to each screening criterion for each alignment. The factors represented the likelihood of a screening criterion to meet the needs and objectives established for the corridor. Table 6.1 describes the impact rating factors.

Table 6.1 Initial Screening Criteria Rating Factors

○	◐	●
Low Impact Best Able to Meet Need & Objectives	Medium Impact Moderately Able to Meet Need & Objectives	High Impact Least Able to Meet Need & Objectives

The needs and objectives previously defined for the US 93 corridor through Polson informed the development of 18 screening criteria. The screening criteria were developed based on input by the TOC and general community. The screening evaluates 11 alignment options against the 6 needs and their respective objectives.

The primary concerns for the US 93 corridor are as follows:

- system linkage and function,
- transportation demand and operation,
- roadway geometrics,
- safety,
- livability and connectivity, and
- truck traffic.
- The sections that follow describe a qualitative and quantitative comparison of each alignment against the needs of the US 93 corridor described above. A matrix summary of the results of the screening process is shown in Table 6.21.

System Linkage and Function

System linkage and function of an alignment relates to the ability to implement access control, and to maintain principal arterial speed. Two screening criteria were developed based on this need.

Access Control

Access control is the condition in which the right of owners or occupants of land abutting a highway is fully or partially controlled by public authority. Access control limits the conflicts with through traffic by limiting the location and number of private and public approaches. (Pizzini 2007) Access control is more difficult to implement in a developed corridor because of the multiple existing private and public approaches that exist. From an access control perspective, the rating factors take into consideration the general distance which an alignment travels through types of land as follows:

Range of Access Control	Rating Factor
Less Developed Land	○
Some Developed Land	◐
Mostly Developed Land	●

Table 6.2 Access Control Rating Factor

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Rating Factor	●	○	○	●	◐	○	●	●	○	○	○

Principal Arterial Speeds

The second criterion under System Linkage and Function is the principal arterial speed of the alignments. The concept of traffic channelization provides for a hierarchy of highway systems that allows for functional specialization in meeting both access and mobility requirements. Principal arterials are designed to provide a high level of mobility for through movement. Alignments that cross developed areas, such as the city, are considered urban and would therefore be subject to speed reduction. Conversely, alignments that stay within rural land would be able to maintain the higher speeds assigned to rural principal arterials. From a principal arterial speed perspective, the rating factors are measured against the distance which an alignment travels within city limits as follows:

Range for Principal Arterial Speeds	Rating Factor
Does not enter City Limits	○
Some Distance within City Limits	◐
Mostly within City Limits	●

Table 6.3 Rating for Principal Arterial Speed

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Rating Factor	●	◐	○	●	◐	◐	●	●	○	○	◐

Transportation Demand and Operation

To accommodate existing and future transportation demand on US 93 through the planning horizon of the year 2030 and fulfill the needs and objectives, an alignment must maintain roadway traffic flow at a LOS B or better for rural principal arterials and LOS C or better for urban principal arterials. Additionally, an alignment would need to have right-of-way available to provide for non-motorized users. There are three screening criteria under this need.

Rural Arterials

Arterials provide the highest level of mobility, at the highest speed, for long uninterrupted travel. The roadway operational performance standard for a rural principal arterial is a LOS B or better. To quantify the operational performance of those segments of the various alignments that are likely to perform as a rural principal arterial, the TransCad travel demand model was utilized. The TransCad model was used to evaluate each of the 11 alignments, and the volume-to-capacity (v/c) ratios were examined along both the existing US 93 corridor and the proposed alignment. For the screening, v/c ratios that were less than 0.59 were identified for all of the alignments under existing year conditions (2010) as well as future year conditions (year 2030). V/c ratios less than 0.59 correspond to a LOS B or better. Accordingly, all proposed alignments were found to operate at a LOS B or better under 2010 and 2030 traffic conditions, and are therefore not explicitly included in Table 6.4. However, the ability of each alignment to pull traffic off US 93 caused a variance in the v/c ratios on the existing US 93. Table 6.4 describes the percentage of the existing US 93, outside of city limits, that operates at a LOS C or worse once traffic is diverted to the respective proposed alignments. The range developed for the rating factors were initially based on third points between 0 and 100 percent, however in reviewing the actual data it was determined to use a range of less than 20 percent, and greater than 60 percent, to realize rating factors that correlated better to the data observed.

Range for Rural LOS B	Rating Factor
Less than 20 percent	○
20 to 60 percent	◐
Greater than 60 percent	●

Table 6.4 Future (2030) Rural Arterials' Rating

Existing US 93 Rating Factor	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Percent of US 93 (Rural) >0.59	100%	23%	23%	11%	23%	23%	11%	11%	23%	11-16%	23%
2030 Rating Factor	●	◐	◐	○	◐	◐	○	○	◐	◐	◐

Urban Arterials

The urban principal arterial system serves major metropolitan centers, corridors with the highest traffic volumes, and those with the longest trip lengths. It carries most trips entering and leaving urban areas, and it provides continuity for all rural arterials that intercept urban boundaries. (State of Montana Department of Transportation 2008)

The roadway operational performance standard for an urban principal arterial is a LOS C or better. To quantify the operational performance of those segments of the various alignments that are likely to perform as an urban principal arterial, the TransCad travel demand model was utilized. The TransCad model was used to evaluate each of the 11 alignments, and the v/c ratios were examined along the existing US 93 corridor and the proposed alignment. For the screening, v/c ratios that were less than 0.79 were identified for all of the alignments under existing year conditions (2010), as well as future year conditions (year 2030). Accordingly, all proposed alignments were found to operate at a LOS C or better under 2010 and 2030 traffic conditions, and are therefore not explicitly included in Table 6.5. However, Table 6.5 does include ratings for the existing US 93 performance under future conditions (year 2030), as noted. The range developed for the rating factors were based on third points between 0 and 100 percent.

Range for Urban LOS C	Rating Factor
Less than 33 percent	○
33 to 67 percent	◐
Greater than 67 percent	●

Table 6.5 Future (2030) Urban Arterials' Rating

Existing US 93 Rating Factor	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Percent of US 93 (Urban) >0.79	28%	29%	41%	29%	29%	27%	25%	29%	42%	29-41%	29%
2030 Rating Factor	○	○	◐	○	○	○	○	○	◐	◐	○

Right-of-Way for Non-motorized Users

The availability of right-of-way needed to provide for non-motorized users depends on the current land use of the area through which an alignment crosses. In an urban/developed area, there are multiple buildings and other constraints that could impede the acquisition of land needed for a smaller facility such as a sidewalk or shared bicycle/pedestrian path to accommodate non-motorized users. In areas where there are numerous existing buildings and/or other constraints, the area was considered to be "highly constrained". If the area an alignment crosses is primarily vacant pasture or agricultural land with few existing buildings and/or other constraints, the area was considered to be "minimally constrained". Rating factors were assigned based on field observations regarding the built-up nature along the alignment "swaths", as well as a review of aerial photographs. Rating factors for this screening criterion are as follows:

Range for Right-of-Way Available	Rating Factor
Minimally Constrained Area	○
Moderately Constrained Area	◐
Highly Constrained Area	●

Table 6.6 Right-of-Way Available for Non-motorized Users Rating

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Rating Factor	●	○	○	●	◐	○	●	●	○	○	○

Roadway Geometrics

To provide a facility that accommodates the diversity of vehicle types and fulfills the objectives for the US 93 corridor, potential screening criteria were developed that would meet the roadway geometric needs and objectives. In order to meet these objectives and needs, an alignment would need to meet design standards for horizontal curve, and road and bridge width. There are two screening criteria under this need.

Horizontal Curves

Each alignment was reviewed to see if it would meet horizontal curve design standards for the design speed of 65 mph for rural roadways and 45 mph for urban roadways. As described previously, EIS Alignment 1 currently passes horizontal curve design standards for both rural and urban sections as seen in Figure 2-5. Additionally, all new alignments would be designed to meet the MDT's geometric design standards. Conversely, EIS alignments 4, 7, and 8 are not designed to meet urban design standards of 45 mph at intersections where curves are incorporated.

Range for Horizontal Curves Design Criteria	Rating Factor
Meet Design Criteria at 65 mph rural/ 45 mph urban	○
Not Able to Meet Design Criteria at 65 mph rural/ 45 mph urban	●

Table 6.7 Horizontal Curve Design Criteria Rating

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Rating Factor	○	○	○	●	○	○	●	●	○	○	○

Bridge and Road Width

The existing Flathead River Bridge does not meet width requirements. The existing bridge could not be expanded to incorporate additional lanes with the current substructure in place. Since all alignments would require the construction of a new bridge structure, all new bridge structures would be designed to meet bridge width standards, and therefore pass the bridge width screening criterion. In terms of roadway width, any new roadway would be designed to meet the MDT's road width standards. Conversely, existing roadways would be more difficult to facilitate such a request. Rating factors for design width criteria are as follows:

Range for Width Design Criteria	Rating Factor
Meet Road and Bridge Design Width	○
Not Able to Meet Road and Bridge Design Width	●

Table 6.8 Road and Bridge Design Criteria Rating

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Rating Factor	●	○	○	●	○	○	●	●	○	○	○

Safety

As stated previously, there is a need to select an alignment that can maintain travel speeds for a principal arterial. In order to maintain the safest roadway environment possible with the desired travel speeds, the selected alignment must manage public access points and private approaches. One way to measure the ability to meet this need is by investigating access density per mile. This is the only screening criterion under this need.

Access Density

In this analysis the total number of access points along each alignment was counted. Access points included each business entrance, private driveway, and street connection. To make this comparison relative to a common unit, the final number of accesses was divided by the total alignment length, in miles, to obtain a density of accesses per mile. Table 6.9 shows the results of this analysis, along with the assigned rating factor.

Range for Access Densities per Mile	Rating Factor
Less than or equal to 5	○
6 less than or equal to 14	◐
Greater than or equal to 15	●

Table 6.9 Access Density per Mile Rating

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Access Density per Mile	20	4	4	15	3	3	20	18	4	4	5
Rating Factor	●	○	○	●	○	○	●	●	○	○	○

Livability and Connectivity

To minimize impacts to neighborhoods and to environmental, sensitive, and recreational resources, each alignment was compared with regard to the number of potential 4(f) / 6(f) resources, residential parcels, sensitive areas, and identified wetlands impacted, as well as the connectivity to community parks and recreation. There are five screening criteria under this need.

4(f) / 6(f) Resources

The number of potential 4(f) / 6(f) resources possibly impacted by an alignment ranges from 0 to 4. Potential 4(f) / 6(f) resources impacts, along with their respective rating factors for each alignment, are described in Table 6.10. A possible impact to a potential 4(f) / 6(f) resource was noted if any portion of an alignment “swath”, as shown on Figure 6-1, appeared to touch or cross a defined resource. This was assessed in the manner of a “worst case” scenario. The accounting of potential 4(f) / 6(f) resource impacts does not include potential impacts to eligible historic homes and/or other structures, as the level of design detail related to specific alignments is unknown at this time.

Range for 4(f) / 6(f) Resources	Rating Factor
No resource impacted	○
1 or 2 resources impacted	◐
3 or 4 resources impacted	●

*Table 6.10 **4(f) / 6(f) Resources Rating***

Alignment ID		4(f) / 6(f) Resource(s) Potentially Impacted *	Number of 4(f) / 6(f) Resources**	Rating Factor
EIS Alignments	1	Ducharme Park, Waterfront Facilities, Riverside Park, Polson 5-6	4	●
	2	Sports Complex	1	◐
	3	--	0	○
	4	Cherry Valley School, Sports Complex	2	◐
	5	--	0	○
	6	Sports Complex	1	◐
	7	Linderman Elementary School, Riverside Park	2	◐
	8	Polson 5-6	1	◐
QUANTM Alignments	Southern Bridge	--	0	○
	Central Bridge	--	0	○
	North Bridge	Sports Complex	1	◐

* Note: This analysis does not include potential impacts to eligible historic homes and/or other structures.

**Note: A public comment received suggested an additional 4(f) resource commonly known as Travis Dolphin Dog Park could be potentially impacted by the alignments. This park was not identified as a 4(f) property during the Environmental Scan Report. Any alignments forwarded from the corridor study into project development will need to be evaluated to determine if the project has the potential to impacts 4(f) or 6(f) resources.

Wetlands

Wetlands were identified using National Wetland Inventory maps throughout the study area and are documented in the Environmental Scan Report. The number of wetlands potentially impacted by an alignment ranges from zero to four. Comparative results of this analysis are shown in Table 6.11.

Range for Wetlands	Rating Factor
No wetlands impacted	○
1 or 2 wetlands impacted	◐
3 or 4 impacted wetlands	●

Table 6.11 Wetlands Rating

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Wetlands Impacted	1	0	1	1	1	2	1	2	0	2	4
Rating Factor	◐	○	◐	◐	◐	◐	◐	◐	○	◐	●

Residential Parcels

The number of residential parcels impacted by an alignment ranges from 4 to 132. To determine the rating factor for this category, the range of residential parcels potentially impacted was divided evenly into three groups: low, medium and high impact. Table 6.12 shows the number of potentially impacted parcels, and rating factor, for each of the alignments.

Range for Residential Parcels	Rating Factor
low impact: 0 to 46 parcels impacted	○
medium impact: 47 to 89 parcels impacted	◐
high impact: > 90 parcels impacted	●

Table 6.12 Residential Parcels Impacted

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Impacted Parcels	71	29	19	68	61	68	<46*	132	26-27	17	4-18
Rating Factor	◐	○	○	◐	◐	◐	○	●	○	○	○

**Note: This assumes the existing roadway for EIS Alignment 7 (one-way couplet) would be reconfigured within the existing right-of-way prism which would therefore only result in impacts where right-of-way for construction would be needed.*

Sensitive Areas

Many sensitive areas were identified throughout the study area as documented in the Environmental Scan Report. The number of sensitive areas potentially impacted by an alignment ranges from 0 to 2. Comparative results of this analysis are shown in Table 6.13.

Range for Sensitive Areas	Rating Factor
No sensitive area impacted	○
1 sensitive area impacted	◐
2 sensitive areas impacted	●

Table 6.13 ***Sensitive Areas Rating***

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Areas Impacted	1	1	0	0	1	0	0	0	2	1	2
Rating Factor	◐	◐	○	○	◐	○	○	○	●	◐	●

Connectivity to Community Parks and Recreation

Based on local input, an element of the screening process needed to be responsive to land use plans such as connectivity to community parks and recreation wherever practicable. Rating factors were assigned based on the relative distance through which the alignments traversed the grid system within the city limits. Alignments that were far away from the grid system, or only entered the system for a few blocks, would not provide this desired connectivity. Conversely, alignments that were within the grid of the city had more potential to connect community parks and recreational areas, and were therefore given a more desirable rating. This analysis is shown below.

Range for Connectivity	Rating Factor
Mostly Within City Grid System	○
Within Grid and Remote Locations	◐
Mostly Remote Location	●

Table 6.14 ***Parks and Recreation Connectivity Rating***

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Rating Factor	○	◐	●	○	◐	◐	○	○	●	●	◐

Truck Traffic

In the corridor study area, US 93 realizes a diverse mix of traffic, including trucks, recreational vehicles, and tourism related traffic and passenger vehicles. To minimize the impacts of truck traffic to the existing US 93, and fulfill the needs and objectives previously discussed, the TOC found it important to screen alignments based on the length of grades greater than 4 percent. This is the only screening criterion under this need.

Length of Grades

Vertical grades greater than four percent require a design exception. Not only do these steeper grades require a design exception, but they are undesirable for truck drivers. Alignments with steep grades may not draw the desired truck traffic away from the existing US 93 facility, especially in the downtown area. Therefore, the longer lengths of grade, greater than the current MDT design standard of four percent, receive a less desirable rating. To determine the rating factor for this category, the range of lengths was divided into three groups as listed below. Table 6.15 shows the rating factor for each of the alignments.

Range for Length of Grades	Rating Factor
Less than 5000 feet	○
5000 to 7500 feet	◐
Greater than 7500 feet	●

Table 6.15 Rating by Length of Grade Greater than Four Percent

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Length (ft)	8600	6790	6740	>7500	7770	7040	>7500	>7500	4050	6300-8840	8540
Rating Factor	●	◐	◐	●	●	◐	●	●	○	●	●

Other

The TOC identified four other criteria in which to screen the alignments. These include the overall planning level cost, the ability of utilities to be incorporated into bridge location and design, community preference, and maintenance cost. Each of these final screening criteria is described herein.

Planning Level Cost

High level planning cost estimates were prepared for each of the eleven potential alignments that were considered. The planning level cost estimates were primarily for construction costs (i.e., did not include detailed right-of-way costs, project development costs, utility relocation costs, inflation, etc.). To develop the planning level cost estimates, line item costs for cut, fill, borrow, demolition, paving, mass haul, retaining walls, culverts, bridges, footprint areas, and road costs were generated for the alignments. The results of the planning level cost estimates are shown in Table 6.16. The rating factors were measured against the highest range of costs for each alignment, with ranges calculated for the three possible ratings:

Range of Planning Level Costs	Rating Factor
Less than $30,000,000	○
Between $30,000,000 and $40,000,000	◐
Greater than $40,000,000	●

Table 6.16 Planning Level Cost Rating

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Planning Level Cost	$23.7 to 28.4M	$34.7 to 41.6M	$30.4 to 36.4M	$27.8 to 33.4M	$41.0 to 44.1M	$45.0 to 48.8M	$22.1 to 26.5M	$26.9 to 32.3M	$37.0 to 47.2M	$36.0 to 43.5M	$33.0 to 39.1M
Rating Factor	○	●	◐	◐	●	●	○	◐	●	●	◐

Incorporation of Utilities into Bridge Location and Design

Based on TOC input, it was agreed that any alignment should attempt to be responsive to local sewer and water planning documents. To uphold the goals set forth in these planning documents, rating factors were assigned based on the ability of utility lines (i.e., water and sewer) to be incorporated into the alignment, coupled with the alignment's ability to perpetuate long-term utility needs in accordance with overall infrastructure requirements. As such, alignments closest to the current bridge were rated higher than alignments with bridge locations that would be constructed further away.

Range of Utilities	Rating Factor
North Bridge Location	○
Central Bridge Location	◐
South Bridge Location	●

Table 6.17 Utilities Incorporation Rating

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Rating Factor	○	○	◐	○	◐	○	○	○	●	◐	○

Community Preference

An additional criterion considered in the screening process was whether the alignment had the support of the community. Community preference is an important screening criterion because if the community does not support an alignment early in the planning process there is likelihood that the alignment will not be supported as a project moves forward. Community preference was solicited on general corridor areas via written and verbal feedback at the informational meetings, solicitation of comments via the study website, and personal conversations with members of the community. Input from the TOC was offered throughout the process to help refine the community's preferences. EIS Alignments 3, 4, 5, 6 and the Central Bridge Crossing received low support due to various factors, including potential impacts to residential housing areas. EIS Alignments 1, 2, and 7 received a relatively equal amount of support and opposition. EIS Alignment 8 and the South and North Bridge Crossing alignments received the highest support from the community. Table 6.18 shows the results of the community preference assessment.

Range of Community Preference	Rating Factor
High Community Preference	○
Medium Community Preference	◐
Low Community Preference	●

Table 6.18 Rating for Community Preference

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Rating Factor	◐	◐	●	●	●	●	◐	○	○	●	○

Maintenance Cost

A query of the statewide average maintenance cost resulted in an average maintenance cost of $4,300 per lane mile. All new alignments include the maintenance cost of not only the new alignment but also of the current US 93 alignment. Since all alignments are two-lane facilities, this factor is primarily dependent upon the length of the alignment.

Range of Maintenance Costs	Rating Factor
Less than $100,000	○
Between $100,000 and $125,000	◐
Greater than $125,000	●

Table 6.19 Maintenance Cost Rating

	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Length (mi)	6.5	5.74	6.48	3.25	5.17	6.64	2.6	2.49	6.65	6.06	5.53
Maintenance. Cost ($1000)	95	127*	133*	105*	122*	135*	100*	99*	135*	130*	125*
Rating Factor	○	●	●	◐	◐	●	◐	○	●	●	◐

**Note: The cost of maintenance to this alignment includes both the current US 93 facility (approximately $77,000) and the new alignment.*

Weighted Average Scoring

Part of the screening process included querying the TOC to identify which criteria were of most importance and least importance to the constituents they represent. Accordingly, each TOC member was asked to rate the screening. For a complete detail of the weighting process, refer to Appendix C of this report. The weighting results from the TOC were divided into four categories of importance. Weighting for the highest importance was given a "1", high importance a "5", medium importance an "8" and lowest importance a "10". Each empty circle was given zero points, each half circle was given half of the category points, and circles that were filled in received the full number of possible points for that screening criterion. Scoring of the objectives is described in Table 6.20.

Table 6.20 Weight Point System Assigned to Screening Criteria

Level of Importance	Highest Possible Points given to Objectives	Corresponding Points for each of the Rating Factors		
		○	◐	●
Highest Importance	1.0	0.0	0.5	1.0
High Importance	5.0	0.0	2.5	5.0
Moderate Importance	8.0	0.0	4.0	8.0
Low Importance	10.0	0.0	5.0	10.0

Screening Results

This scoring system helped identify which alignments could be dropped from further consideration and which alignments should be carried forward if a project moves forward. Options with the lowest overall numerical value were kept for further consideration and are detailed in Table 6.21. The remaining alignments, which were dropped from further consideration, are also presented in Table 6.21 for completeness.

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Table 6.21 ***Summary of Corridor Need & Objectives Screening Criteria***

Corridor Need & Objectives Screening Criteria (highest possible rating value)	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
System linkage and function											
Ability to implement access control (5)	● 5.0	○ 0.0	○ 0.0	● 5.0	◐ 2.5	○ 0.0	● 5.0	● 5.0	○ 0.0	○ 0.0	○ 0.0
Ability to maintain principal arterial speeds (10)	● 10.0	◐ 5.0	○ 0.0	● 10.0	◐ 5.0	◐ 5.0	● 10.0	● 10.0	○ 0.0	○ 0.0	◐ 5.0
Transportation demand and operation											
Maintain 2030 roadway traffic flow at LOS B or better (rural principal arterial) (8)	● 8.0	◐ 4.0	◐ 4.0	○ 0.0	◐ 4.0	◐ 4.0	○ 0.0	○ 0.0	◐ 4.0	◐ 4.0	◐ 4.0
Maintain 2030 roadway traffic flow at LOS C or better (urban principal arterial) (5)	○ 0.0	○ 0.0	◐ 2.5	○ 0.0	○ 0.0	○ 0.0	○ 0.0	○ 0.0	◐ 2.5	◐ 2.5	○ 0.0
Right-of-way available to provide for non-motorized users (5)	● 5.0	○ 0.0	○ 0.0	● 5.0	◐ 2.5	○ 0.0	● 5.0	● 5.0	○ 0.0	○ 0.0	○ 0.0
Roadway geometrics											
Meet horizontal curve design criteria (10)	○ 0.0	○ 0.0	○ 0.0	● 10.0	○ 0.0	○ 0.0	● 10.0	● 10.0	○ 0.0	○ 0.0	○ 0.0
Meet road and bridge width design criteria (8)	● 8.0	○ 0.0	○ 0.0	● 8.0	○ 0.0	○ 0.0	● 8.0	● 8.0	○ 0.0	○ 0.0	○ 0.0
Safety											
Access density per mile (8)	● 8.0	○ 0.0	○ 0.0	● 8.0	○ 0.0	○ 0.0	● 8.0	● 8.0	○ 0.0	○ 0.0	○ 0.0
Livability and connectivity											
Number of 4(f) / 6(f) resources potentially impacted (1)	● 1.0	◐ 0.5	○ 0.0	◐ 0.5	○ 0.0	◐ 0.5	◐ 0.5	◐ 0.5	○ 0.0	○ 0.0	◐ 0.5
Number of wetlands potentially impacted (5)	◐ 2.5	○ 0.0	◐ 2.5	◐ 2.5	◐ 2.5	◐ 2.5	◐ 2.5	◐ 2.5	○ 0.0	◐ 2.5	● 5.0
Number of residential parcels potentially impacted (1)	◐ 0.5	○ 0.0	○ 0.0	◐ 0.5	◐ 0.5	◐ 0.5	○ 0.0	● 1.0	○ 0.0	○ 0.0	○ 0.0
Number of sensitive areas potentially impacted (1)	◐ 0.5	◐ 0.5	○ 0.0	○ 0.0	◐ 0.5	○ 0.0	○ 0.0	○ 0.0	● 1.0	◐ 0.5	● 1.0

Corridor Need & Objectives Screening Criteria (highest possible rating value)	EIS Alignments								QUANTM Alignments		
	1	2	3	4	5	6	7	8	South Bridge	Central Bridge	North Bridge
Connectivity to community parks and recreation (8)	○ 0.0	◐ 4.0	● 8.0	○ 0.0	◐ 4.0	◐ 4.0	○ 0.0	○ 0.0	● 8.0	● 8.0	◐ 4.0
Truck traffic											
Length of grades greater than 4 percent (8)	● 8.0	◐ 4.0	◐ 4.0	● 8.0	● 8.0	◐ 4.0	● 8.0	● 8.0	○ 0.0	● 8.0	● 8.0
Other											
Overall planning level cost (10)	○ 0.0	● 10.0	◐ 5.0	◐ 5.0	● 10.0	● 10.0	○ 0.0	◐ 5.0	● 10.0	● 10.0	◐ 5.0
Ability of utilities to be incorporated into bridge location and design (10)	○ 0.0	○ 0.0	◐ 5.0	○ 0.0	◐ 5.0	○ 0.0	○ 0.0	○ 0.0	● 10.0	◐ 5.0	○ 0.0
Community preference (1)	◐ 0.5	◐ 0.5	● 1.0	● 1.0	● 1.0	● 1.0	◐ 0.5	○ 0.0	○ 0.0	● 1.0	○ 0.0
Maintenance cost (10)	○ 0.0	● 10.0	● 10.0	◐ 5.0	◐ 5.0	● 10.0	◐ 5.0	○ 0.0	● 10.0	● 10.0	◐ 5.0
Screen Result	**57**	**38.5**	**42**	**68.5**	**50.5**	**41.5**	**62.5**	**63**	**45.5**	**51.5**	**37.5**

Based on results of the screening, five (5) alignment options score lowest out of the eleven total alignments considered. These 5 alignments were selected based on their point ratings as measured against all 11 alignments. The point ratings for each alignment that were within a range of ten points or less were identified and selected for consideration. These include the following:

- North bridge crossing (score of 37.5)
- EIS Alignment 2 (score 38.5)
- EIS Alignment 6 (score 41.5)
- EIS Alignment 3 (score 42)
- South bridge crossing (score 45.5)

The remaining six (6) alignments that scored outside the point margin were dropped from further consideration. Reasons for exclusion of each of the alignments are detailed below.

<u>EIS Alignment 1</u>

Alignment 1 was unable to accommodate eight of the 18 screening criteria and was moderately able to accommodate 4 other screening criteria. Because this alignment traverses the heart of Polson's business district, there is a high access density. It would be difficult to implement access control throughout the urban sections of this alignment. It would also be difficult to receive the community's and businesses' support for widening the roadway footprint to accompany non-motorized users, or to bring the roadway up to current MDT design standards.

This alignment has the potential to impact a moderate number of residential parcels and sensitive areas, and has the potential to impact the highest number of 4(f) and 6(f) resources. This alignment received minimal support from members of the community or the TOC.

Although this alignment failed to meet many of the screening criteria and was dropped during the selection process, improvements will be required along the existing US 93 during the twenty-year planning horizon. Potential improvements to the existing US 93 will be identified in the Polson Area Transportation Plan.

<u>EIS Alignment 4</u>

Alignment 4 was unable to meet eight of the 18 screening criteria and was moderately able to meet five other screening criteria. Because this alignment travels through the existing roadway network and residential part of the City of Polson, this alignment has a very high access density throughout its urban section. This alignment would be unable to implement access control.

With the constrained environment surrounding the urban portion of this alignment, this alignment would be unable to provide additional right-of-way needed for non-motorized users or to upgrade the existing transportation facility to the current MDT roadway design standards. Due to the sharp horizontal curves throughout this alignment, the desired standard for a 45 mph urban principal arterial would not be met. This alignment also had steep grades, which would deter trucks from using this route.

This alignment has the potential to impact a moderate number of 4(f) and 6(f) resources and residential parcels, and was not an alignment desired by the community. All of the factors described above caused this alignment to be dropped from further consideration.

EIS Alignment 5

Alignment 5 was unable to meet three screening criteria. It was only moderately able to meet 10 additional screening criteria. Because a large portion of the length of this alignment travels through the city limits of Polson, the posted speed limit would be reduced to that of an urban principal arterial. The slower urban principal arterial speed, coupled with the number of long grades over four percent, could deter trucks from using this route.

This alignment travels through a large amount of remote, virgin terrain which has minimal connections to Polson's transportation grid system. With only minimal connections to the existing transportation system, this alignment is moderately able to provide connectivity to community parks and recreation facilities. A high overall construction cost and moderate maintenance cost also played a factor in this alignment's elimination.

This alignment had the potential to impact a moderate number of residential parcels and sensitive areas. Additionally, this alignment did not receive support from the community and was therefore not a preferred alignment. All of the factors described above caused this alignment to be dropped from further consideration.

EIS Alignment 7

Alignment 7 was unable to meet seven screening criteria and was moderately able to meet four additional screening criteria. Because this alignment travels through the roadway network and residential/commercial part of the City of Polson, this alignment has a very high access density throughout its urban section. This alignment would be unable to accommodate access control.

Due to the horizontal curves near the two bridges for this alignment, the desired criteria for a 45 mph urban principal arterial would not be met. This alignment also had steep grades and a slower speed associated with an urban arterial, which would deter trucks from using this route.

This alignment has the potential to impact a moderate number of 4(f) and 6(f) resources and received mixed feedback regarding its preference from the community. Additionally, this alignment would require two new bridges, and potentially impact the downtown core, especially in light of recent streetscape improvements to Main Street. All of the factors described above caused this alignment to be dropped from further consideration.

EIS Alignment 8

Alignment 8 was unable to meet eight screening criteria and was moderately able to meet three additional screening criteria. Because this alignment travels through the roadway network and residential/commercial part of the City of Polson, this alignment has a very high access density throughout its urban section. Similarly, this alignment would be unable to implement access control.

With the constrained environment surrounding the urban portion of this alignment, this alignment would be unable to provide additional right-of-way needed for non-motorized users or to upgrade the existing transportation facility to the current MDT roadway design standards. Due to the right angle horizontal curve near the bridge for this alignment, the desired criteria for a 45 mph urban principal arterial would not be met. This alignment also had steep grades, which may deter trucks from using this route.

This alignment has the potential to impact a moderate number of 4(f) and 6(f) resources and a large number of residential parcels. All of the factors described above caused this alignment to be dropped from further consideration.

Central Bridge Crossing

The Central Bridge Crossing alignment was unable to meet five screening criteria and was moderately able to meet five additional criteria. A high overall construction cost and maintenance cost played a factor in the Central Bridge Crossing's elimination. All of the factors described above caused this alignment to be dropped from further consideration.

Hybrid/Modified Alignments

Community input, coupled with direction from the TOC, led to slight modifications of the five selected alignments to minimize residential impacts near Ponderrilla Hills. Since the original EIS alignments 2 and 3 are relatively close to the Quantm generated alignments of the southern bridge crossing and the northern bridge crossing, a hybrid was developed between the southern bridge crossing alignment and EIS Alignment 3. A second hybrid was developed between the northern bridge crossing alignment and EIS Alignment 2. These two hybrid alignments, referred to as the "southern bridge crossing hybrid alignment" and the "northern bridge crossing hybrid alignment" respectively, are shown on Figure 6-1. The third alignment under consideration, EIS Alignment 6, was modified slightly from that presented in the 1996 FEIS to avoid the existing residential area known as Ponderilla Hills and is referred to as the "modified EIS alignment 6". The modification is primarily noted south of Ponderilla Hills where it routes closer to the existing irrigation ditch, similar to the other two hybrid alignments.

The three hybrid/modified alignments described above, and shown in Figure 6-1, were initially recommended to be carried forward for further consideration if a project moves forward from this study. These alignments are reflective of the results of the screening process and capture the analysis results accordingly. It is noted that the three alignments are planning level "swaths" that may be subject to additional modifications during the environmental review process if a project is forwarded from this study.

The three alignments were scanned against the 18 screening criteria to gauge whether they would continue to rank similar in the final overall results. Due to the lack of substantial differences between each hybrid alignment and its original state, a brief comparative description of these 18 criteria is provided in the following paragraphs.

Since each hybrid/modified alignment continued to traverse a comparative amount of developed land as its original alignment, similar rankings for the following screening criteria were determined: access control; principal arterial speeds; right-of-way available for non-motorized users; horizontal, road, and bridge design criteria; access density; connectivity to parks and recreation; and incorporation of utilities into bridge location and design. Because the distance and grade of each of the hybrid alignments is similar to their respective original alignments, the ranking for length of grades greater than four percent, LOS for urban and rural roadways, and maintenance costs were determined to be similar to the original rankings. Finally, the hybrid/modified alignments were not shifted near any 4(f)/6(f) sites and therefore each hybrid/modified alignment ranked similar to its original alignment with regard to 4(f)/6(f) properties.

Slight modifications of the alignments from their respective original alignments have the potential to change the results of five screening criteria that follow: potential wetlands impacted, residential impacts, sensitive areas, project costs, and community preference. However, many of these details are dependent on final design which would only be available if a project moves forward from this study. How the community of Polson develops over the next few years will also determine which alternate route is the best option for the community.

Additional information was reviewed pertinent to the modified EIS alignment 6. Local community representatives on the TOC, elected officials, the general public, and the consultant team evaluated the community acceptability of modified EIS alignment 6, and based on all available information it was recommended to eliminate this alignment. Reasons for this conclusion are the greater potential to disturb undeveloped land (as compared to the other two) and the high degree of public opposition to the route. After a review and analysis of this information, it was decided that two of the hybrid/modified alignments, the northern and southern bridge crossing, be carried forward for further consideration if a project moves forward from this study. These two alignments are shown on Figure 6-2.

Figure 6-1 ***Initial Hybrid Alignments Under Consideration***

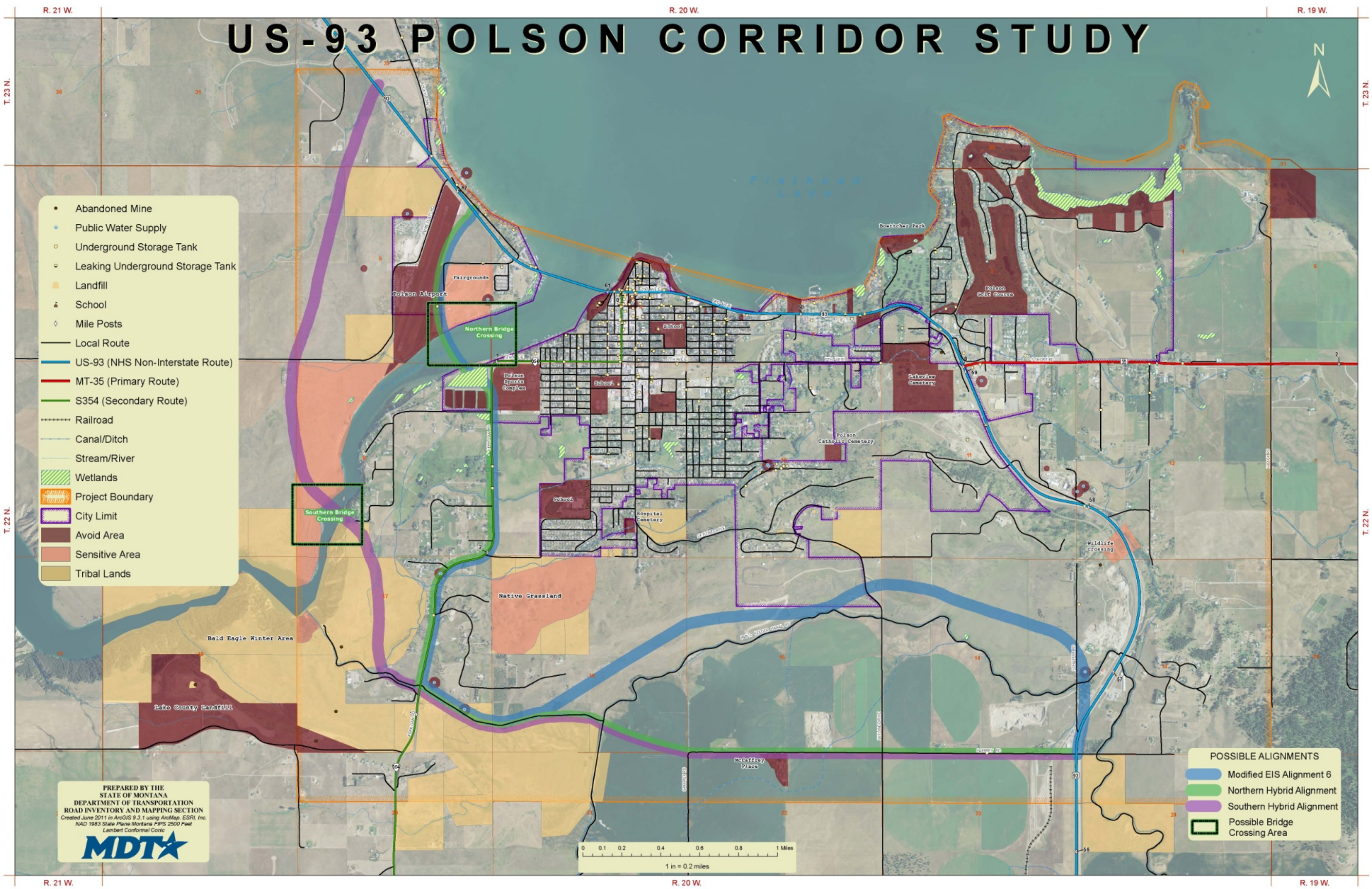
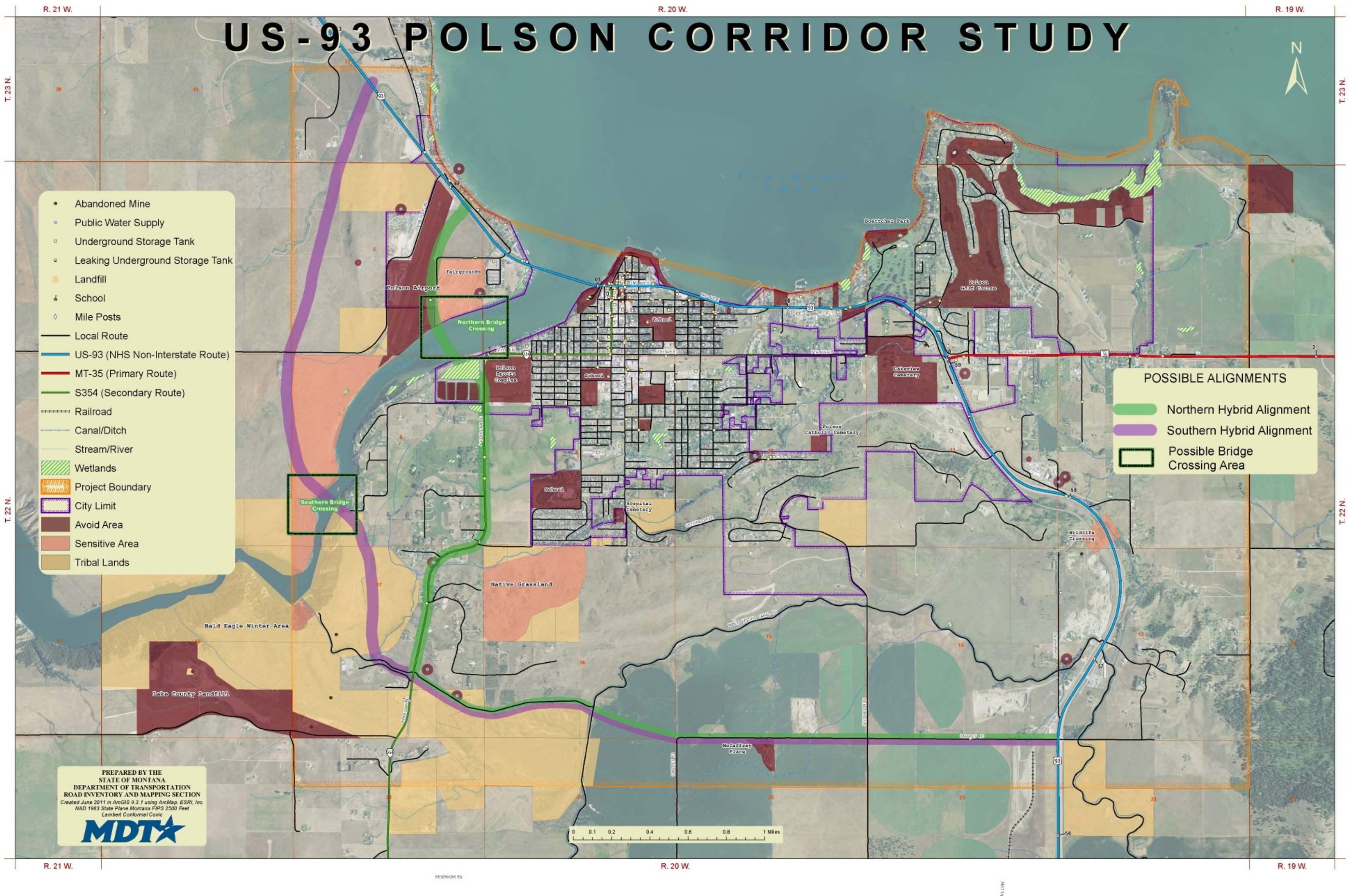


Figure 6-2 Recommended Hybrid Alignments



6.4 Operational Analysis

The conclusion of the screening process was to recommend two alignments if a project moves forward. The two alignments are shown on Figure 6-2 and are referred to as the southern bridge crossing hybrid alignment and the northern bridge crossing hybrid alignment. An operational analysis was conducted to provide further information regarding the two alignments, along with the eliminated modified EIS alignment 6, if a project moves forward.

The operational analysis relies on evaluating the three alignments using four analyses. The four analyses are as follows:

> Analysis No. 1 – Shift in Thru-Truck Traffic: This analysis is intended to evaluate the potential quantity of thru-truck traffic that may be removed from the existing US 93, given the presence of an alternate route.
>
> Analysis No. 2 – Intersection Level of Service: This analysis is intended to quantify several intersections according to its future level of service. This includes identifying those intersections that will operate at an intersection LOS B or better (for rural intersections) or an intersection LOS C or better (for urban intersections) based on the performance of each alignment during the planning year 2030.
>
> Analysis No. 3 – Travel Time: This analysis is intended to predict the travel time that may occur on each alignment. The travel time prediction is extracted from the TransCad travel demand model that was utilized for the three potential alignments
>
> Analysis No. 4 – Cost Comparison: This analysis is used to document the order of magnitude planning level costs for each alignment. These costs are generated by the Quantm route optimization tool and are reflective of construction costs (i.e., do not include detailed right-of-way costs, project development costs, utility relocation costs, inflation, etc.). Although not a true component of the operational analysis, it is included herein for informational purposes based on the desire expressed by the community for current planning-level cost estimates.

For each analysis, the three alignments were given a numerical rating value of one to three, with one being the best and three being the worst. The operational analysis is described in the following sections.

6.4.1 Shift in Thru-Truck Traffic

The "shift in thru-truck traffic" analysis was utilized to evaluate the potential quantity of thru-truck traffic that may be removed from the existing US 93 given the presence of an alternate route. The process used to arrive at the potential shift in thru-truck traffic relies on the use of the TransCAD travel demand model, and the 2009 Truck Origin and Destination (O&D) study completed by the MDT.

Each alignment was modeled in the TransCAD travel demand model to extract the potential change in model traffic volumes, for both the existing US 93 and the proposed alignments, after implementing each of the respective proposed alignments. The TransCad model includes predicted land use changes out to the planning year 2030. From the percent changes, actual known volumes from the count locations along the existing US 93 were adjusted to determine the potential average daily traffic volumes that may be realized on the three alignments for the year 2030.

The 2009 Truck O&D study was intended to analyze the travel patterns of truck and vehicle traffic on both sides of Flathead Lake. The study stated that from 2007 to 2009 the average percentage of truck traffic on US 93 in Polson, when compared to all vehicle traffic, was 8.4 percent. Furthermore, according to MDT's O&D Study, 44 percent of all truck traffic was thru-truck traffic. Based on these percentages, the amount of thru-truck traffic for each alignment was calculated and is shown in Table 6.22.

Table 6.22 Projected (2030) Amount of Thru-Truck Traffic in Polson

Alignment ID	Truck Traffic without alternate route	Truck Traffic with alternate route	Diff.	Thru-Truck Traffic without alternate route	Thru-Truck Traffic with alternate route	Diff.	Rating*
Southern Bridge Crossing Hybrid	1,045	794	251	460	349	111	1
Northern Bridge Crossing Hybrid	1,045	800	245	460	352	108	1
EIS Alignment 6	1,045	796	249	460	350	110	1

**Note: This analysis was based on a rating of one to three with one being the most desirable rating*

All three alignments have the potential to remove similar amounts of truck traffic, including thru-truck traffic, from the existing US 93. Accordingly, all three alignments were assigned a rating value of one for this analysis.

6.4.2 Intersection Level of Service

This analysis is intended to determine which alignment would best accommodate traffic and offer the least amount of intersection difficulties in the projected future year (2030). LOS for an intersection is a qualitative measure developed by the transportation profession to quantify driver perception for such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles. It provides a scale that is intended to match the perception by motorists of the operation of the intersection. LOS provides a means for identifying intersections that are experiencing operational difficulties, as well as providing a scale to compare intersections with each other. The LOS scale represents the full range of operating conditions. The scale is based on the ability of an intersection to accommodate the amount of traffic using it. The scale ranges from "A" which indicates little, if any, vehicle delay, to "F" which indicates substantial vehicle delay and traffic congestion. The LOS analysis was conducted according to the procedures outlined in the Transportation Research Board's Highway Capacity Manual – Special Report 209 using the Highway Capacity Software, version 4.1f.

Existing Level of Service

In order to calculate the existing LOS, 16 intersections were counted during the summer and fall of 2010. These intersections included 5 signalized intersections and 11 unsignalized intersections in the Polson area. Each intersection was counted between 7:00 a.m. to 9:00 a.m. and 4:00 p.m. and 6:00 p.m., to ensure that the intersection's peak volumes were represented. Based upon this data, the operational characteristics of each intersection were obtained. Intersection turning movement counts were completed along the existing US 93 during the month of August, 2010 to capture the peak tourism traffic phenomena. According to data collected through MDT's Automatic Traffic Recorder (ATR) Station A-074 (located on US 93 just south of MT 28) during the year 2010, the months of July and August exhibit the highest peak traffic flows of 150.16% and 139.49 %, respectively, of yearly annual average daily traffic (AADT) flow.

Signalized Intersections

For signalized intersections, recent research has determined that average control delay per vehicle is the best available measure of LOS. The following table identifies the relationship between LOS and average control delay per vehicle. The procedures used to evaluate signalized intersections use detailed information on geometry, lane use, signal timing, peak hour volumes, arrival types and other parameters. This information is then used to calculate delays and determine the capacity of each intersection. Generally, a signalized intersection within city limits (urban) is determined to be functioning adequately if operating at LOS C or better, at all times. Table 6.23 shows the LOS by control delay for signalized intersections.

Table 6.23 Level of Service Criteria (Signalized Intersections)

LOS	Control Delay per Vehicle (sec)
A	< 10
B	10 to 20
C	20 to 35
D	35 to 50
E	50 to 80
F	> 80

Source: The Transportation Research Board's Highway Capacity Manual

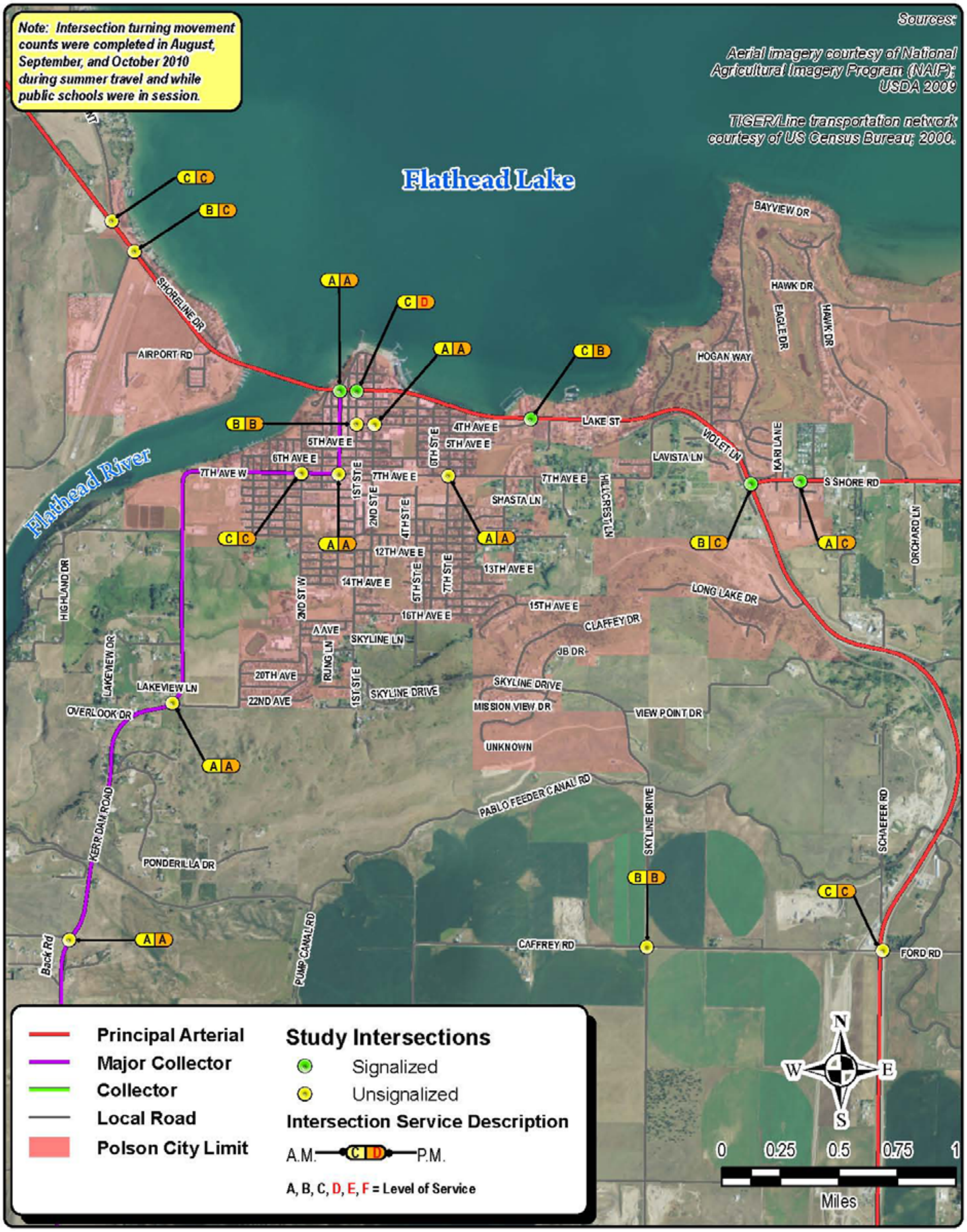
Using the data collected in the summer and fall of 2010, the LOS for the signalized intersections was calculated. Table 3.24 shows the AM and PM peak hour LOS for each individual leg of the intersections, as well as the intersections as a whole. The intersection LOS is shown graphically on Figure 6-2.

Table 6.24 Existing (2010) Level of Service for Signalized Intersections

Intersection	AM Peak Hour					PM Peak Hour				
	EB	WB	NB	SB	INT	EB	WB	NB	SB	INT
US 93 & South Shore Road (MT 35)	-	C	A	B	B	-	C	B	C	C
US 93 (3rd Avenue East) & 4th Avenue East	A	A	F	D	C	A	A	F	D	B
US 93 (2nd Avenue East) & 1st Street East	C	C	C	B	C	C	C	D	C	D
US 93 (2nd Avenue East) & Main Street*	A	A	N/A	E	A	A	A	N/A	E	A
South Shore Road (MT 35) & Heritage Lane	A	A	E	-	A	A	A	F	-	C

(Abbreviations used are as follows: EB = eastbound; WB = westbound; NB = northbound; SB = southbound; INT = intersections as a whole; N/A = not applicable). * Main Street NB approach under construction during time of data collection.

Figure 6-3 Existing (2010) Intersection Level of Service



Unsignalized Intersections

Level of service for unsignalized intersections is based on the delay experienced by each movement within the intersection, rather than on the overall stopped delay per vehicle at the intersection. This difference from the method used for signalized intersections is necessary since the operating characteristics of a stop-controlled intersection are substantially different. Driver expectations and perceptions are entirely different. For two-way stop controlled intersections, the through traffic on the major (uncontrolled) roadway experiences no delay at the intersection. Conversely, vehicles turning left from the minor roadway experience more delay than other movements and at times can experience substantial delay. Vehicles on the minor roadway, which are turning right or going across the major roadway, experience less delay than those turning left from the same approach. Due to this situation, the LOS assigned to a two-way stop controlled intersection is based on the average delay for vehicles on the minor roadway approach.

LOS for all-way stop controlled intersections is also based on delay experienced by the vehicles at the intersection. Since there is no uncontrolled roadway, the highest delay could be experienced by any of the approaching roadways. Therefore, the LOS is based on the approach with the highest delay as shown in Table 6.25. This table shows the LOS criteria for both the all-way and two-way stop controlled intersections.

Table 6.25 Level of Service Criteria (Unsignalized Intersections)

Level of Service	Delay (seconds/vehicle)
A	< 10
B	10 to 15
C	15 to 25
D	25 to 35
E	35 to 50
F	> 50

Source: The Transportation Research Board's Highway Capacity Manual

Using the above guidelines, the data collected in the summer and fall of 2010 and calculation techniques for two-way stop controls and all-way stop controls, the LOS was calculated for 11 intersections. Table 6.26 shows the detailed results of the performance level of service by turning movement for each unsignalized intersection.

Table 6.26 Existing (2010) Level of Service for Unsignalized Intersections

Unsignalized Intersection	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
US 93 & Rocky Point Road				
Eastbound Left/Thru	7.6	A	8.3	A
Southbound Left/Right	16.3	C	15.6	C
US 93 & Irvine Flats Road				
Eastbound Left/Thru/Right	7.7	A	8.2	A
Westbound Left/Thru/Right	8.6	A	8.0	A
Northbound Left/Thru/Right	11.8	B	13.4	B
Southbound Left/Thru/Right	13.9	B	18.8	C
US 93 & Caffrey Road				
Eastbound Left/Thru/Right	12.1	B	12.6	B
Westbound Left/Thru/Right	23.6	C	18.5	C
Northbound Left	8.3	A	8.6	A
Southbound Left	8.2	A	8.8	A
4th Avenue East & 1st Street East *				
Eastbound Left/Thru/Right	8.59	A	8.82	A
Westbound Left/Thru/Right	9.62	A	9.92	A
Northbound Left/Thru/Right	10.84	B	11.30	B
Southbound Left/Thru/Right	10.11	B	10.95	B
4th Avenue East & 2nd Street East *				
Eastbound Left/Thru/Right	8.31	A	8.04	A
Westbound Left/Thru/Right	8.25	A	7.87	A
Northbound Left/Thru/Right	7.87	A	8.05	A
Southbound Left/Thru/Right	8.38	A	7.90	A
7th Avenue & Main Street *				
Eastbound Left/Thru/Right	8.45	A	8.85	A
Westbound Left/Thru/Right	8.73	A	9.37	A
Northbound Left/Thru/Right	8.00	A	8.51	A
*Southbound Left/Thru/Right ** *	*N/A*	*N/A*	*N/A*	*N/A*
7th Avenue West & 2nd Street West				

Unsignalized Intersection	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Eastbound Left/Thru/Right	7.4	A	7.6	A
Westbound Left/Thru/Right	8.3	A	7.8	A
Northbound Left/Thru/Right	13.0	B	13.3	B
Southbound Left/Thru/Right	24.8	C	18.4	C
7th Avenue East & 7th Street East *				
Eastbound Left/Thru/Right	8.22	A	9.04	A
Westbound Left/Thru/Right	8.10	A	8.60	A
Northbound Left/Thru/Right	8.18	A	8.60	A
Southbound Left/Thru/Right	7.84	A	8.67	A
Skyline Drive & Caffrey Road				
Eastbound Left/Thru/Right	11.3	B	10.3	B
Westbound Left/Thru/Right	9.2	A	9.2	A
Northbound Left/Thru/Right	7.3	A	7.3	A
Southbound Left/Thru/Right	7.4	A	7.3	A
Kerr Dam Road (S 354) & Grenier Lane				
Westbound Left/Thru/Right	9.4	A	9.5	A
Southbound Left/Thru/Right	7.6	A	7.4	A
Northbound Left/Thru/Right	7.3	A	7.4	A
Kerr Dam Road (S 354) & Back Road				
Eastbound Left/Thru/Right	9.5	A	9.4	A
Southbound Left/Thru/Right	7.4	A	7.3	A
Northbound Left/Thru/Right	7.3	A	7.4	A

*(Abbreviations used are as follows: N/A = not applicable). * HCM methodology does not compute v/c ratios for four–way stop controlled intersections. ** Main Street SB approach under construction during time of data collection.*

Projected Intersection Level of Service

It is important to determine what the Level of Service for each intersection would be like in 20 years if no improvements occur on the transportation system. By calculating the "projected level of service" out to the planning year (2030), a baseline is created to compare improvements to either the existing US 93, or the sensitivity to an alternate alignment. To calculate level of service for intersections during the planning year (2030), the TransCAD modeling software was used to identify the percent change in volumes for individual intersection legs between the year 2010 and 2030. The resulting percent changes were then manually applied to the known intersection counts to arrive at theoretical year 2030 intersection turning movement counts. These "year 2030" intersection counts were then entered into the highway capacity software to determine intersection level of service. Note that the intersection turning movement counts completed along the existing US 93 were generally made during the month of August, 2010 to capture the peak hour tourism phenomena. Tables 6.27 and 6.28 show the year 2030 level of service, for both the urban and rural intersections, without the inclusion of an alternate route or any improvements to the existing US 93.

Table 6.27 Projected (2030) Urban Intersection LOS without Improvements or Alignment

Intersection	AM Peak Hour					PM Peak Hour				
	EB	WB	NB	SB	INT	EB	WB	NB	SB	INT
US 93 & South Shore Road (MT 35)*	-	D	A	C	**B**	-	C	B	C	**C**
US 93 (3rd Avenue East) & 4th Avenue East*	A	A	F	D	**C**	A	A	F	D	**F**
US 93 (2nd Avenue East) & 1st Street East*	C	C	C	B	**C**	D	D	D	C	**D**
US 93 (2nd Avenue East) & Main Street*	A	A	D	D	**A**	A	A	F	F	**F**
South Shore Road (MT 35) & Heritage Lane*	A	A	E	-	**A**	A	A	F	-	**D**
US 93 & Rocky Point Road	A	-	-	B	**B**	A	-	-	B	**B**
US 93 & Irvine Flats Road	A	A	B	-	**B**	A	A	B	-	**B**
4th Avenue East & 1st Street East	A	A	B	A	**B**	A	A	B	B	**B**
4th Avenue East & 2nd Street East	A	A	A	A	**A**	A	A	A	A	**A**
7th Avenue & Main Street	B	A	A	-	**A**	B	A	A	-	**A**
7th Avenue West & 2nd Street West	A	A	B	E	**C**	A	A	C	D	**C**
7th Avenue East & 7th Street East	A	A	A	A	**A**	A	A	A	A	**A**

** Note: These intersections are signalized intersections*
(Abbreviations used are as follows: EB = eastbound; WB = westbound; NB = northbound; SB = southbound; INT = intersections as a whole; N/A = not applicable).

Table 6.28 Projected (2030) Rural Intersection LOS without Improvements or Alignment

Intersection	AM Peak Hour					PM Peak Hour				
	EB	WB	NB	SB	INT	EB	WB	NB	SB	INT
US 93 & Caffrey Road	B	D	A	A	**C**	C	D	A	A	**C**
Skyline Drive & Caffrey Road	-	A	A	A	**A**	-	A	A	A	**A**
Kerr Dam Road (S 354) & Grenier Lane	-	A	A	A	**A**	-	B	A	A	**B**
Kerr Dam Road (S 354) & Back Road	A	-	A	A	**A**	A	-	A	A	**A**

(Abbreviations used are as follows: EB = eastbound; WB = westbound; NB = northbound; SB = southbound; INT = intersections as a whole; N/A = not applicable).

Tables 6.27 and 6.28 show that if no improvements to the existing US 93 are made, or if no alternate route to US 93 was constructed, multiple intersections would not meet a desirable LOS of B or better (for rural areas) or C or better (for urban areas). For urban intersections, four intersections would not meet the LOS C or better criteria. These intersections are as follows: US 93 / 4th Avenue East, US 93 / 1st Street East, US 93 / Main Street, and MT 35 / Heritage Lane. The only rural intersection that would not meet LOS B or better would be US 93 / Caffrey.

Once this baseline was created, the effects on intersection LOS resulting from inclusion of each of the three alignments was calculated and compared. Only those intersections around the periphery of the proposed alignments were included for this analysis. Accordingly, six of the sixteen intersections were not included. These six intersections include 7th Avenue East & 7th Street East, 4th Avenue East & 2nd Street East, 4th Avenue East & 1st Street East, 7th Avenue & Main Street, 7th Avenue West & 2nd Street West, and South Shore Road (MT 35) & Heritage Lane. Additionally, a seventh intersection was removed for this comparison due to the uncertainty of intersection turning movement volumes. This intersection is the intersection of Skyline Drive and Caffrey Road.

Table 6.29 Projected (2030) Intersection LOS on Existing US 93

Intersection	Overall LOS	
	AM Peak Hour	PM Peak Hour
US 93 & South Shore Road (MT 35)*	B	C
US 93 (3rd Avenue East) & 4th Avenue East*	C	**F**
US 93 (2nd Avenue East) & 1st Street East*	C	**D**
US 93 (2nd Avenue East) & Main Street*	A	**F**
US 93 & Rocky Point Road	B	B
US 93 & Irvine Flats Road	B	B
US 93 & Caffrey Road**	**C**	**C**
Kerr Dam Road (S 354) & Grenier Lane**	A	B
Kerr Dam Road (S 354) & Back Road**	A	A

NOTES:
** These intersections are signalized intersections.*
*** These intersections are considered to be in the "rural" area (i.e., outside of current Polson city limits).*
****Two-way, stop controlled (TWSC) intersection methodology does not compute an overall LOS. Values presented are for worst minor, side street approach.*

Table 6.30 Projected (2030) Intersection LOS with Inclusion of Southern Bridge Crossing Hybrid

Intersection	Overall LOS	
	AM Peak Hour	PM Peak Hour
US 93 & South Shore Road (MT 35)*	B	C
US 93 (3rd Avenue East) & 4th Avenue East*	B	**D**
US 93 (2nd Avenue East) & 1st Street East*	C	C
US 93 (2nd Avenue East) & Main Street*	A	**F**
US 93 & Rocky Point Road	C	C
US 93 & Irvine Flats Road	B	B
US 93 & Caffrey Road**	**F**	**F**
Kerr Dam Road (S 354) & Grenier Lane**	A	A
Kerr Dam Road (S 354) & Back Road**	B	B

NOTES:
** These intersections are signalized intersections.*
*** These intersections are considered to be in the "rural" area (i.e., outside of current Polson city limits).*
****Two-way, stop controlled (TWSC) intersection methodology does not compute an overall LOS. Values presented are for worst minor, side street approach.*

Table 6.31 Projected (2030) Intersection LOS with Inclusion of Northern Bridge Crossing Hybrid

Intersection	Overall LOS	
	AM Peak Hour	PM Peak Hour
US 93 & South Shore Road (MT 35)*	B	C
US 93 (3rd Avenue East) & 4th Avenue East*	B	**D**
US 93 (2nd Avenue East) & 1st Street East*	C	C
US 93 (2nd Avenue East) & Main Street*	A	**F**
US 93 & Rocky Point Road	C	C
US 93 & Irvine Flats Road	B	C
US 93 & Caffrey Road**	**F**	**F**
Kerr Dam Road (S 354) & Grenier Lane**	B	B
Kerr Dam Road (S 354) & Back Road**	B	B

NOTES:
** These intersections are signalized intersections.*
*** These intersections are considered to be in the "rural" area (i.e., outside of current Polson city limits).*
****Two-way, stop controlled (TWSC) intersection methodology does not compute an overall LOS. Values presented are for worst minor, side street approach.*

Table 6.32 Projected (2030) Intersection LOS with Inclusion of EIS Alignment 6

Intersection	Overall LOS	
	AM Peak Hour	PM Peak Hour
US 93 & South Shore Road (MT 35)*	B	C
US 93 (3rd Avenue East) & 4th Avenue East*	B	**D**
US 93 (2nd Avenue East) & 1st Street East*	C	C
US 93 (2nd Avenue East) & Main Street*	A	**F**
US 93 & Rocky Point Road	C	C
US 93 & Irvine Flats Road	B	B
US 93 & Caffrey Road**	**D**	**D**
Kerr Dam Road (S 354) & Grenier Lane**	B	B
Kerr Dam Road (S 354) & Back Road**	B	B

NOTES:
** These intersections are signalized intersections.*
*** These intersections are considered to be in the "rural" area (i.e., outside of current Polson city limits).*
****Two-way, stop controlled (TWSC) intersection methodology does not compute an overall LOS. Values presented are for worst minor, side street approach.*

Tables 6.29 through 6.32 show that implementation of any alignment option would result in the same intersections failing the LOS thresholds uniformly. In all three alignment options, three intersections failed to meet the desired urban and rural LOS criteria. The three intersections are common to all three alignment options and are as follows: US 93 / 4th Avenue East, US 93 / Main Street, and US 93 / Caffrey. In addition to the three failing intersections, if no alternate route was implemented, the intersection of US 93 / 1st Street East would fail on existing US 93. Table 6.33 shows that all three alignments were given a rating of 1.

Table 6.33 Future (2030) Intersection LOS Results

Alignment ID	Rating*
Southern Bridge Crossing Hybrid	1
Northern Bridge Crossing Hybrid	1
EIS Alignment 6	1

**Note: This analysis was based on a rating of one to three with one being the most desirable rating*

6.4.3 Travel Time

This analysis is intended to compare the theoretical travel time for vehicles travelling along each alignment. Based on several factors contained in the TransCad model (i.e., speeds, capacity, intersection delays, etc.), a theoretical travel time under "congested" conditions is obtained. Travel time is important to the vehicle driver, as the shorter the time to travel a route between two known similar points is generally more desirable when compared to a longer travel time between the same points.

Table 6.34 depicts the theoretical travel time for each of the three alignments as derived from the TransCad travel demand model. The shortest travel time was noted for the southern bridge crossing hybrid, and was therefore given a rating of 1. There was not enough difference between EIS Alignment 6 and the north bridge crossing hybrid travel times to warrant a point differential; therefore, both were given a rating of 2.

Table 6.34 Travel Time Comparison

Alignment ID	Travel Time (minutes)	Rating*
Southern Bridge Crossing Hybrid	6.39	1
Northern Bridge Crossing Hybrid	6.93	2
EIS Alignment 6	7.28	2

**Note: This analysis was based on a rating of one to three with one being the most desirable rating*

In addition to the travel time along the alternate route, the model also determined the travel time along the existing US 93, with the new alignment(s) in place. The travel time along the existing US 93 varied from 8.79 minutes to 9.90 minutes depending on which alternate alignment was implemented.

6.4.4 Cost Comparison

The hybrid alignments were modeled in the Quantm software to document the planning level costs for each alignment. Although not a true component of the operational analysis, it is included herein for informational purposes based on the desire expressed by the community for current planning-level cost estimates. The costs generated by Quantm are reflective of construction costs (i.e., do not include detailed right-of-way costs, project development costs, utility relocation costs, inflation, etc.). The three alignments were rated from one to three based on their overall costs. The low end costs presented in Table 6.37 reflect the average cost projection from the Quantm software (in 2011 dollars). Each cost projection was inflated by a 20 percent contingency factor to account for preliminary engineering costs, construction engineering costs, and IDC accounting procedures costs.

Table 6.35 Cost Comparison

Alignment ID	Cost	Rating*
Southern Bridge Crossing Hybrid	$50.1 – $60.1M	2
Northern Bridge Crossing Hybrid	$43.8 – $52.6M	1
EIS Alignment 6	$48.5 - $58.2M	2

**Note: This analysis was based on a rating of one to three with one being the most desirable rating*

6.4.5 Recommendation for Feasible Alignments

The conclusion of the operational analysis is that the northern bridge crossing hybrid alignment, the southern bridge crossing hybrid alignment, and the modified EIS alignment 6 all could be carried forward for future consideration. The close rating values of 5, 5, and 6 for the southern bridge crossing hybrid, northern bridge crossing hybrid, and EIS alignment 6, respectively, confirmed that all three alignments essentially perform similarly. As previously documented, it was recommended to eliminate the modified EIS alignment 6 from further consideration. Accordingly, it was decided that two of the hybrid/modified alignments, the northern and southern bridge crossing, be recommended for further consideration if a project moves forward from this study.

The results of the operational analysis are shown in Table 6.36.

Table 6.36 Operational Analysis Results

	Southern Bridge Crossing Hybrid	Northern Bridge Crossing Hybrid	EIS Alignment 6
Shift in Thru-Truck Traffic	1	1	1
Intersection LOS Point System Results	1	1	1
Travel Time	1	2	2
Cost Comparison	2	1	2
Total	**5**	**5**	**6**

Both the southern bridge crossing hybrid and the northern bridge crossing hybrid routes would satisfy the needs and objectives for the US 93 corridor and are candidates for development of an alternate route if carried forward for further development. The proximity of the northern bridge crossing hybrid alignment to the downtown area may allow for a revitalized 7th Avenue connection to the route sometime in the future. The northern bridge crossing hybrid alignment utilizes a portion of existing roadways and existing right-of-ways, such as Caffrey Road and Kerr Dam Road, resulting in the minimizing of new impacts to currently virgin land. Near the crossing of the Flathead River, the northern bridge crossing hybrid alignment can be modified to traverse the western edge or the eastern edge of the Fairgrounds property. This is a detail yet-to-be-determined; however, routing the alignment to the westerly property edge would avoid the newly constructed fire station near the eastern edge of this property but would traverse the grand stands.

The southern bridge crossing hybrid alignment, the longer of the two, would be the most costly, would traverse a larger percentage of undeveloped land that has high aesthetic and wildlife value to the community, and would result in an elevated bridge crossing of the Flathead River when compared to the northern bridge crossing hybrid alignment. However, the travel time would be the least due to the higher free flow travel speed along the route and the fact that it traverses through more, undeveloped lands than the northern route.

6.5 Alternate Route versus Existing US 93

This study follows up on the 1996 FEIS where numerous alternate routes were identified. Current conditions within the study area and a preliminary screening analysis reduced the number of possible alignments (including those listed in the FEIS) to two. These two alignments should be considered as part of the environmental documentation should a future project be developed. The previous section identified the potential operational considerations associated with the three alternate alignments (included the eliminated modified EIS 6 alignment). The intent of this section is to explore the major issues that have been expressed by the community and the TOC over the 12-month study development process. An important consideration is - what are the trade-offs for an alternate route versus the existing US 93 and whether an alternate route is even warranted? To address these concerns, key issues have been categorized into six topic areas. They are:

- Truck Traffic
- Congestion
- Livability
- Safety
- Economics
- Wildlife/Natural Habitat

6.5.1 Truck Traffic

A fundamental objective expressed by the TOC at the beginning of the corridor study process was to identify the ability of an alternate route to remove "thru-truck" traffic off of the existing US 93. Based on the traffic analysis (see data in Table 6.22), the alternate route(s) under consideration may be able to capture approximately 110 thru-trucks per day. This calculation was based on the usage of Annual Average Daily Traffic (AADT) volumes on the existing US 93, modeled to the year 2030. An important concept to understand is that Polson realizes elevated traffic volumes during the summer months. The month of July can realize traffic volumes elevated to approximately 150 percent of AADT, and the month of August can realize traffic volumes elevated to approximately 139% of AADT. In theory, the number of "thru-trucks" could elevate accordingly, in which case the ability to pull thru-trucks onto an alternate route may reach 165 thru-trucks.

The documentation of potential thru-truck shift is applicable just to "thru-trucks". Local truck traffic will continue to utilize whichever roadways are necessary for their purposes. The ability to potentially pull 165 thru-trucks off of the existing US 93 is considered to be desirable. This could equate to approximately 16 to 17 thru-trucks per hour during the peak summer months.

6.5.2 Congestion

The concern over congestion was expressed frequently throughout development of the corridor study by the community and the TOC. At the various informational meetings, statements made by the community suggested that US 93 traffic was not an issue except during the summer months where long waits and substantial delays occur frequently. Congestion can be thought of as consisting of three components: roadway segment congestion, intersection congestion (LOS) and travel time.

Roadway Segments

In a planning study it is advantageous to examine existing and future daily traffic volumes to compare those volumes against planning level corridor thresholds. In the existing US 93 corridor, weighted average AADT volumes ranged from a low of 9,884 vehicles per day (vpd) to a high of 12,610 vpd. These volumes (noted in Table 2.1) are capable of being accommodated within the current roadway configuration. However, during the peak summer months, these volumes do push the capacity thresholds of the roadway. The month of July may realize an elevated volume of 150 percent of the AADT. The peak summer traffic volume would therefore range between 14,826 and 18,285 vpd. The high-end volume is very close to exceeding the capacity of the existing roadway and would likely require a larger facility to convey current traffic if designing to the peak travel summer period.

When adjusting out to the year 2030, these volumes are expected to grow even further. With an estimated 24 percent growth in overall traffic volumes along US 93 over the next 20 years, projected weighted average traffic volumes may range between 12,256 and 15,636 vpd. The volumes on US 93 during the year 2030 are projected to range between 18,384 and 23,454 vpd during the peak summer months.

If only considering AADT, then the projected year 2030 volumes of 12,256 to 15,636 vpd may indeed be able to be accommodated within the existing roadway prism. However, if peak summer volumes are considered, it is highly likely that capacity will be exceeded on the current US 93 system through Polson.

Travel demand modeling demonstrates that the presence of an alternate route could divert approximately 6,000 vpd (9,000 vpd during peak summer months) from US 93 thereby alleviating potential capacity constraints. The shifting of these traffic volumes would allow the existing US 93 to function well into the future under the existing geometrics (i.e., no expansion needed for traffic conveyance).

A summary of roadway congestion issues are as follows:

- ✓ The existing roadway can carry year 2010 traffic volumes and may likely carry year 2030 traffic volumes,

- ✓ The existing roadway is currently nearing capacity for peak summer traffic volumes for year 2010 and most likely will not carry year 2030 peak summer traffic volumes, and
- ✓ Providing an alternate route may likely pull 6,000 weighted average AADT (9,000 AADT during peak summer traffic) off the existing US 93 during the year 2030.

Intersection Congestion

An analysis of intersections LOS was presented in section 6.4.2. Intersection LOS analysis is the best mechanism to evaluate how individual intersections may perform given changes in traffic volumes, and for the operational analysis a comparison of nine subject intersections were made.

The conclusions of the LOS analysis of the nine comparison intersections is that without an alternate route, four of the nine intersections will fall below acceptable LOS standards without some type of improvement along the existing US 93 roadway. With an alternate route, three intersections operate below an acceptable LOS.

This is an important realization because based on intersection performance, the creation of an alternate route does not “solve” all of the intersection operational issues along the existing US 93. Even though there is an ability to pull 6,000 vpd (AADT) to 9,000 vpd (peak summer month) off of the existing route, there are still likely to be some performance issues with several of the intersections. These could likely be resolved with optimization of traffic signal hardware, timing and phasing, etc. - however in an “apples-to-apples” comparison, the implementation of an alternate route will not solve all of the intersection concerns along the existing US 93.

A summary of intersection congestion issues are as follows:

- ✓ With no alternate route, four of the nine study intersections are expected to fall below the relevant LOS operational standard(s) by the year 2030, and
- ✓ With an alternate route, three of the nine study intersections are expected to fall below the relevant LOS operational standard(s) by the year 2030.

Travel Time

Congestion can also be correlated to travel time. The time it takes to get from point A to point B is dependent on the delay, and therefore congestion, the driver might experience. Section 6.4.3 presented the results of the travel time analysis for the alternate routes. These were compared against each other, as well as against the existing US 93 route. Travel time is faster for all the alternate routes with a range of 6.39 to 7.28 minutes, and is longer for the existing US 93 with an average of 9.35 minutes. These values came from the TransCad travel demand model for average travel conditions. These times would be expected to be longer during the peak summer travel period.

A summary of travel time is as follows:

- ✓ Travel time on an alternate route could be up to 2 to 3 minutes faster than the existing US 93 route (during average travel conditions), and

- ✓ Travel time will be longest during the peak summer travel period on both an alternate route and the existing US 93.

6.5.3 Livability

Livability is an important component to the community. At several of the informational meetings, the community expressed a desire for increased connectivity between the residential areas and the lakefront. Additionally, the desire for on-street bicycle lanes and off-street sidewalks was routinely expressed. Strengthening crosswalk opportunities was also expressed as an important consideration.

Providing an alternate route would draw traffic away from the existing route, thereby reducing the opportunity for potential conflicts between vehicles and pedestrians/bicyclists. Regardless of an alternate route, implementing on-street bicycle lanes would require an expansion of the roadway prism due to the constraints on both sides of the existing US 93. An alternate route may provide opportunities for future connections between the more rural lands and Polson proper.

Noise impacts and aesthetics would be improved along the existing US 93 facility, while a new alternate route would introduce impacts to the areas surrounding Polson not previously occurring.

A summary of livability concerns is as follows:

- ✓ The community expressed a strong desire for non-motorized improvements to the existing US 93 in the form of sidewalks, improved connectivity between the residential neighborhoods and the lakefront, and on-street bicycle lanes,
- ✓ To realize bicycle lanes on the existing US 93, expansion to the roadway prism would be required – both with or without an alternate route,
- ✓ An alternate route may provide previously unavailable non-motorized connections between the city of Polson and the rural lands surrounding it, and
- ✓ With an alternate route, noise impacts may be reduced on the existing US 93 and increased around the alternate route.

6.5.4 Safety

Safety concerns were documented along the existing US 93 route through an evaluation of crash rates for the rural and urban-like portions of the roadway, and compared to statewide averages for roadways of similar type. Based on this data analysis presented in section 2.11, the average vehicle crash rate(s) in the rural areas of the corridor were slightly higher than the average statewide crash rate for rural sections of similar type. The developed and downtown areas of the existing US 93 (i.e., from MT-35 to Irvine Flats Road) exhibited an average vehicle crash rate much less than the average statewide crash rate for incorporated cities of Montana.

The prevalence of access points also points to safety concerns in that during the peak summer travel period, vehicles are routinely observed backing out into the US 93 roadway prism as they wait to enter private drive approaches. Several popular business approaches lead directly to small parking lots with little storage capacity. The numerous access points have an effect on the safety performance within the developed area of the corridor. Safety could likely be improved with an alternate route in place, due to the removal of traffic volumes from the existing route.

A summary of safety concerns is as follows:

- ✓ The average vehicle crash rate(s) in the rural areas of the corridor are slightly higher than the average statewide crash rate for rural sections,
- ✓ The developed downtown areas of the existing US 93 (i.e. from MT-35 to Irvine Flats Road) exhibited an average vehicle crash rate much less than the average statewide crash rate for similar incorporated cities of Montana, and
- ✓ The numerous access points have an effect on the safety performance of the developed area of the corridor and could likely be improved with an alternate route in place.

6.5.5 Economics

There have been concerns expressed about the impact an alternate route may have on the businesses along the existing US 93 corridor. Many of the businesses state that they rely on capturing the peak summer traffic flow for a substantial portion of their business revenues. Additionally, the downtown business core has expressed concern about any removal of traffic from the existing route. Detailed economic impacts of a potential alternate route cannot be documented in this high level pre-NEPA/MEPA corridor study. Further analysis would be addressed in a formal project-level environmental document, should an alternate route be considered.

A summary of economic concerns is as follows:

- ✓ There have been concerns expressed about the impact an alternate route may have on the businesses along the existing US 93 corridor. The downtown business core has expressed concern about any removal of traffic from the existing route, and
- ✓ The specific study of economic impacts would be addressed in a formal project-level environmental document, should an alternate route be considered.

6.5.6 Wildlife/Natural Habitat

The location of an alternate route has generated considerable comments about preserving the natural habitat currently undisturbed for the benefit of wildlife, waterfowl and agricultural usage. The recommended alignments that have been considered traverse portions undisturbed lands that are currently used by a variety of wildlife species. The concerns expressed by some members of the community have that an alternate route may cut off connectivity of habitat types, and further push wildlife away from their historical habitat.

A summary of wildlife/natural habitat concerns is as follows:

- ✓ Some community members have expressed concern over an alternate route cutting off connectivity of habitat types, and further pushing wildlife away from their historical habitat, and
- ✓ Keeping US 93 along the current alignment will have the least amount of wildlife/natural habitat impact.

6.6 Recommended Improvements to Existing US 93

Without an alternate route, improvements to the existing US 93 will be necessary to accomplish the needs and objectives set forth by the community relative to multi-modal travel, connectivity, perpetuation of traffic flow, and aesthetics. Improvements to the existing US 93 will be documented in the Polson Area Transportation Plan.