US 93 Polson Corridor Study

First Level Screening Criteria

Prepared For:

City of Polson

Lake County

Confederated Salish & Kootenai Tribes

Montana Department of Transportation

Prepared By:

Camp Dresser & McKee Inc.

Helena, Montana

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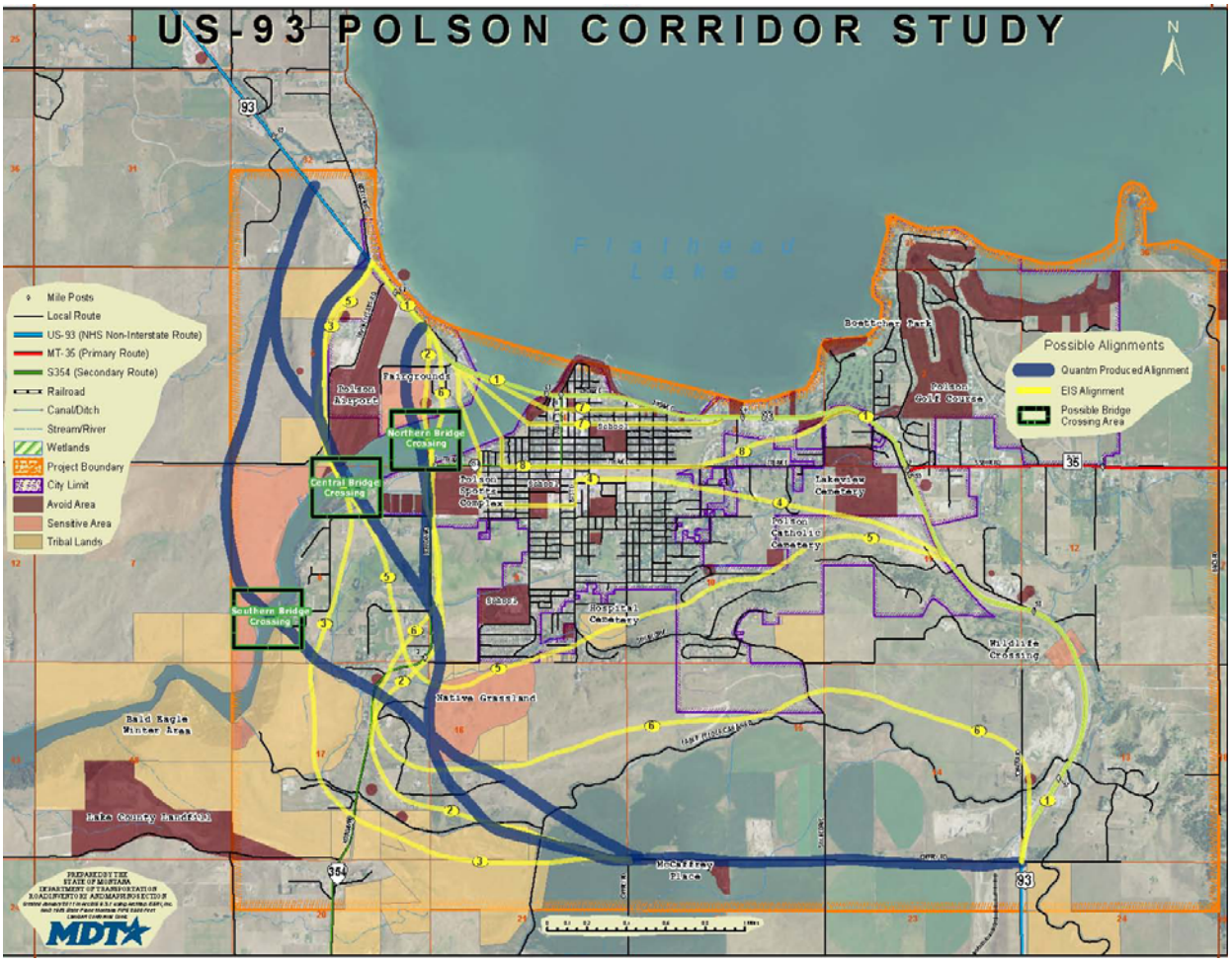
Section 6.3 Improvement Option Screening Process

Screening criteria were developed to assist in the evaluation of the eleven (11) 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 consisted of two screening steps. The "first level" screening was a high level screen that was utilized to identify alignment options that satisfied the needs and objectives laid forth previously, and subsequently could be carried forward for consideration in the second level of screening. The second level of screening will be more detailed and will evaluate shifts in traffic volumes, intersection operations, and potential impacts to safety.

The screening process described in this section illustrates each alignment's ability to meet the screening criteria and each alignment's respective scoring. Figure 6-1 depicts the eleven (11) alignments.

Figure 6-1 US 93 Polson Original Alignment Options



6.1 Rating Factors

In order to rate each screening criterion, 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

A qualitative and quantitative comparison of each alignment against the needs identified for the US 93 corridor is described below. A matrix summary of the results of the first screening is shown in Table 6.22.

6.2 First Level Screening Criteria

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 Technical Oversight Committee (TOC) and general public. The first level of screening evaluates 11 alignment options against the six (6) needs and 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.

6.2.1 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 through 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	●	◐	○	●	◐	◐	●	●	○	○	◐

6.2.2 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 Level B or better for rural principal arterials and Level C or better for urban principal arterials. Additionally, an alignment would need to have ROW 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 level of service of 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 level of service of B or better. Accordingly, all proposed alignments were found to operate at a level of service 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 level of service 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 level of service of 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 level of service 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 paths, as well as a review of aerial photographs. Rating factors for this screening criterion are as follows:

Range for ROW 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	●	○	○	●	◐	○	●	●	○	○	○

6.2.3 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 need and objectives. In order to meet these objectives and needs, an alignment would need to meet

horizontal curve, and road and bridge width, design standards. 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. Although alignment EIS 1 currently passes horizontal curve design standards for the posted speed, it was not designed to meet the design standard for 45 mph through the city limits. Additionally, EIS alignments 4, 7, and 8 are not designed to meet urban design standards of 45 mph at intersections where curves are incorporated. Conversely, all new alignments would be designed to meet the MDT's geometric design standards.

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. 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	●	○	○	●	○	○	●	●	○	○	○

6.2.4 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	●	○	○	●	○	○	●	●	○	○	○

6.2.5 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 4(f) / 6(f) resources, residential parcels, sensitive areas, and wetlands impacted, as well as the connectivity to public parks and recreation. There are five screening criteria under this need.

4(f) / 6(f) Resources

The number of 4(f) / 6(f) resources potentially 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 potential impact to a 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 this manner as 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.

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	◐

- Does not include potential impacts to eligible historic homes and/or other structures.

Wetlands

Wetlands were identified throughout the study area and are documented in the Environmental Scan. 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. The number of sensitive areas potentially impacted by an alignment ranges from 0 to two. 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 public 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 public 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 public 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	○	◐	●	○	◐	◐	○	○	●	●	◐

6.2.6 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	●	◐	◐	●	●	◐	●	●	○	●	●

6.2.7 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 first level 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 $4300 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.

6.2.8 Weighted Average Scoring

Part of the screening process included querying the TOC to identify which criteria was of most importance and least importance to the constituents they represent. Accordingly, each TOC member was asked to rate the screening criteria into thirds by assigning the top third of the eighteen screening criteria a numerical value of 1, the middle third of the eighteen screening criteria a numerical value of 2, and the bottom third of the screening criteria a numerical value of 3. TOC member scores for each of the criteria were totaled. The results of this exercise are shown in Table 6.20. These totals 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 6.21.

Table 6.20 Importance of Objectives – Weighted Average Exercise for TOC Entities

Corridor Need & Objectives Screening Criteria	Weighting Exercise – Average of Each Entity					
	CSKT	Lake Co.	City	MDT*	FHWA*	**Total Value**
System linkage and function						
Ability to implement access control	1	1	3	1	2	**8**
Ability to maintain principal arterial speeds	3	3	3	1	2	**12**
Transportation demand and operation						
Maintain roadway traffic flow at LOS B or better (rural principal arterial)	2	2	2	2	2	**10**
Maintain roadway traffic flow at LOS C or better (urban principal arterial)	1	1	2	2	2	**8**
ROW available to provide for non-motorized users	2	2	1	2	2	**9**
Roadway geometrics						
Meet horizontal curve design criteria	2	3	3	3	2	**13**
Meet road and bridge width design criteria	2	2	2	2	2	**10**
Safety						
Access density per mile	1	2	1	3	3	**10**
Livability and connectivity						
Number of 4(f) / 6(f) resources potentially impacted	1	1	1	1	1	**5**
Number of wetlands potentially impacted	2	1	1	2	2	**8**
Number of residential parcels potentially impacted	1	1	1	1	1	**5**
Number of sensitive areas potentially impacted	1	1	1	1	1	**5**
Connectivity to public parks and recreation	2	2	1	3	3	**11**

Corridor Need & Objectives Screening Criteria	Weighting Exercise – Average of Each Entity					
	CSKT	Lake Co.	City	MDT*	FHWA*	**Total Value**
Truck traffic						
Length of grades greater than 4 percent	3	2	3	2	1	**11**
Other						
Overall planning level cost	2	3	3	2	3	**13**
Ability of utilities to be incorporated into bridge location and design	3	2	2	3	3	**13**
Community preference	1	1	2	1	1	**6**
Maintenance cost	3	3	2	3	2	**13**

*Note: The weighting exercise for these stakeholders resulted in an average of multiple individuals involved. Rounding of average results led to final values contained in this table.

Table 6.21 Weight Point System Assigned to Screening Criteria

Total Points from Table 6.20	Corresponding Level of Importance	Highest Possible Points given to Objectives	Corresponding Points for each of the Rating Factors		
			○	◐	●
5 to 7	Highest Importance	1.0	0.0	0.5	1.0
8 or 9	High Importance	5.0	0.0	2.5	5.0
10 or 11	Moderate Importance	8.0	0.0	4.0	8.0
12 to 14	Low Importance	10.0	0.0	5.0	10.0

6.2.9 First Level Screening Results

This scoring system helped identify which alignments could be dropped from further consideration and which alignments should be carried forward to the second level of screening. Options with the lowest overall numerical value were kept for further consideration and are detailed in Table 6.22. The remaining alignments, which were dropped from further consideration, are also presented in Table 6.22 for completeness.

Table 6.22 Summary of Corridor Need & Objectives Screening Criteria (First Level)

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
ROW 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 public 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 first level of screening, it can be seen that five (5) alignment options score lowest out of the eleven total alignments considered. These five (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 10 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 alternatives are detailed below.

EIS Alignment 1

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 public'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. Although this alignment is being dropped from further consideration, there will be improvements 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, which is currently under development at this time.

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 the community.

EIS Alignment 4

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 ROW 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 public 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 ROW 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

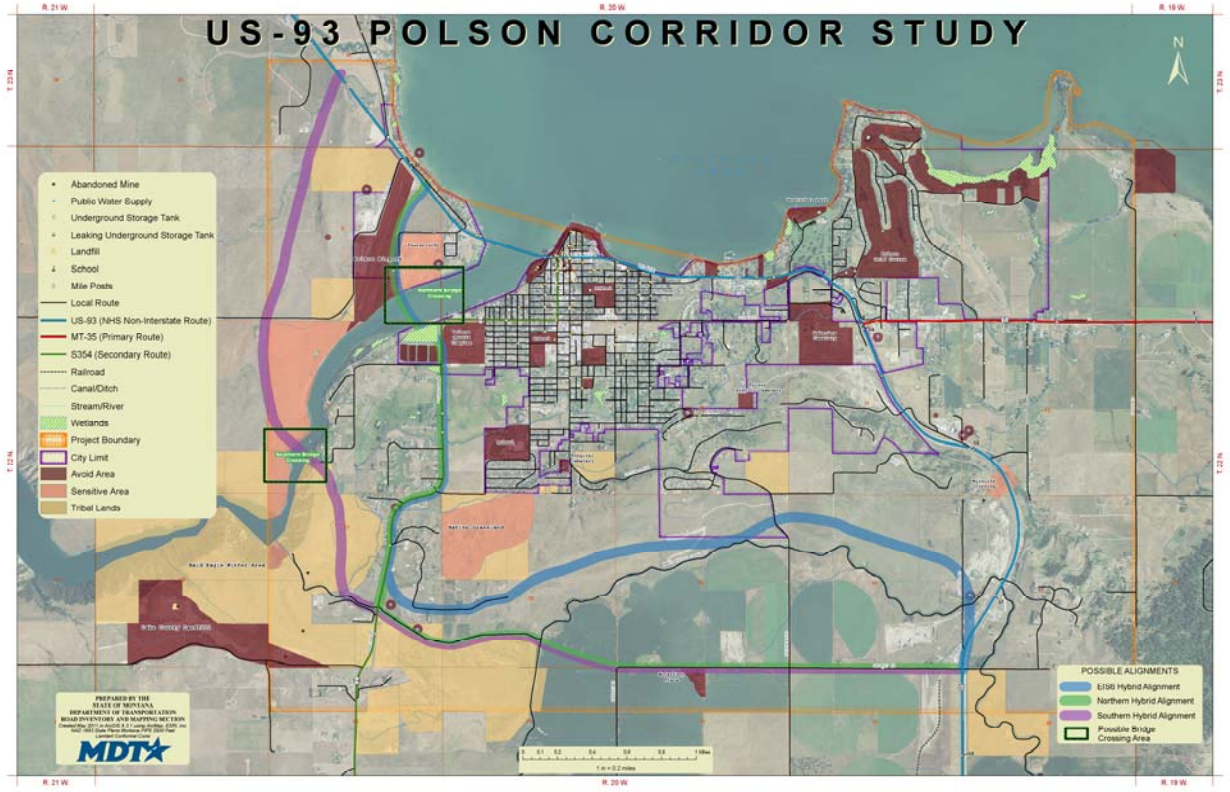
The Central Bridge Crossing alignment was unable to meet five screening criteria and was moderately able to meet five additional criteria. A high overall construction cost and maintenance cost played a factor in the Central Bridge Crossing's elimination. All of the factors described above caused this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

6.2.10 Refined Hybrid 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 numbers 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 number 3. A second hybrid was developed between the northern bridge crossing alignment and EIS alignment number 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 6-2 on the following page. The third alignment under consideration, EIS 6, has been modified slightly from that presented in the 1995 EIS to follow the existing roadway of Ponderilla Drive. Should this alignment screen highest in the second level of screening, it is recommended to further explore modifications to deviate from Ponderilla Drive by traversing to the southeast along the irrigation canal system before tying into Kerr Dam Road.

The three hybrid alignments described above, and shown in Figure 6-2, are recommended to be carried forward into the second level of screening. The three hybrid alignments are reflective of the results of the first level screening, and capture the analysis results accordingly. It is noted that the three hybrid alignments are planning level "swaths" that may be subject to additional modifications after the second level of screening is completed.

Figure 6-2 Hybrid Alignments Forwarded to Second Level of Screening



6.3 References

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