APPENDIX F:
SCREENING RESULTS MEMORANDUM

Technical Memorandum

Alternatives Screening Results

To:	Brett Nelson, Project Manager, Alaska Department of Transportation and Public Facilities
From:	Renee Whitesell, PEL Study Lead
Date:	January 28, 2026
Project:	Triangle Community Road PEL Study
	NFHWY00769

PEL Study Description

The Arctic Strategic Transportation and Resources (ASTAR) program is a partnership between the Alaska Department of Natural Resources (DNR) and North Slope Borough (NSB) created to identify, evaluate, and advance opportunities to enhance the quality of life and economic opportunities in North Slope communities through responsible infrastructure development. The ASTAR team identified community connectivity between Atqasuk, Utqiaġvik, and Wainwright as a top priority of community members in the region[1]. To advance this project, DNR and NSB are working in partnership with the Department of Transportation and Public Facilities (DOT&PF) to deliver a Planning and Environmental Linkages (PEL) Study.

The Triangle Community Road PEL Study is advancing to consider transportation connections between the communities, while concurrently working with stakeholders and the community to receive feedback on whether a roadway connection is desired.

The study area boundary, where the community road may be located, is shown in Figure 1.

[1] *Road Network for Utqiaġvik, Atqasuk, and Wainwright - Arctic Strategic Transportation and Resources Project North Slope, Alaska. April 2020*

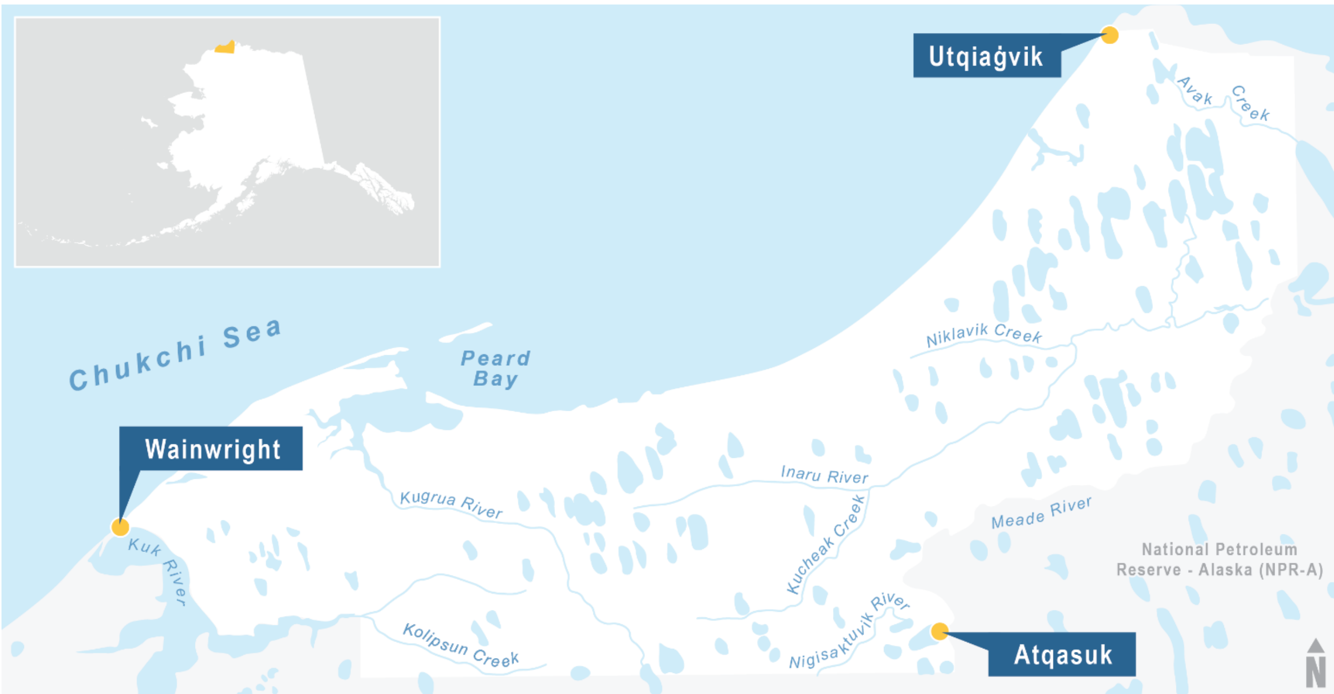

Figure 1: Study Area

Purpose of the Technical Memorandum

This technical memorandum provides the results of the qualitative and quantitative screening to support the identification of recommended alternatives for potential future National Environmental Policy Act (NEPA) review as part of the Triangle Community Road PEL Study (Project Numbers: NFHWY00769/0002[521]) and represents the final stage of PEL alternatives screening.

Alternative Selection Process

The screening process is a decision-making framework to determine how well each alternative meets the project purpose and needs (P&N) and the additional goals. NEPA requires that a reasonable range of alternatives be considered and reviewed objectively, and that the selection process and alternatives eliminated be well documented. This screening process will meet these documentation requirements including the elimination of alternatives from further consideration during a future NEPA process and the identification of reasonable alternatives that will be evaluated during future project development under NEPA.

Under NEPA, reasonable alternatives are those that are practical and feasible from a technical, engineering, environmental, economic, and social standpoint, and which meet the P&N for the project. The screening process compares the advantages and disadvantages of a broad range of alternatives for advancement through stages of development into more refined alternatives and, ultimately, the recommended reasonable alternative(s) included in this technical memorandum.

An iterative step alternative selection process for this PEL Study is described below. The Recommended Alternative Screening Criteria technical memorandum (dated December 18, 2025) provides detailed methods for five screening steps. This memo outlines the alternative development and screening as it relates to Step 4, application of the screening criteria, and will be reflected in the PEL Study as it relates to Step 5, Documentation:

4. **Apply screening.** Screening of the alternatives based on the P&N, and other considerations using a range of qualitative and quantitative criteria including engineering constraints, and environmental and social and economic impacts. The goal is to compare and rank the alternatives and to identify a recommended alternative(s).
5. **Documentation:** The screening results will be documented in the PEL Study and PEL Questionnaire.

The screening process is summarized in the following Figure 2:

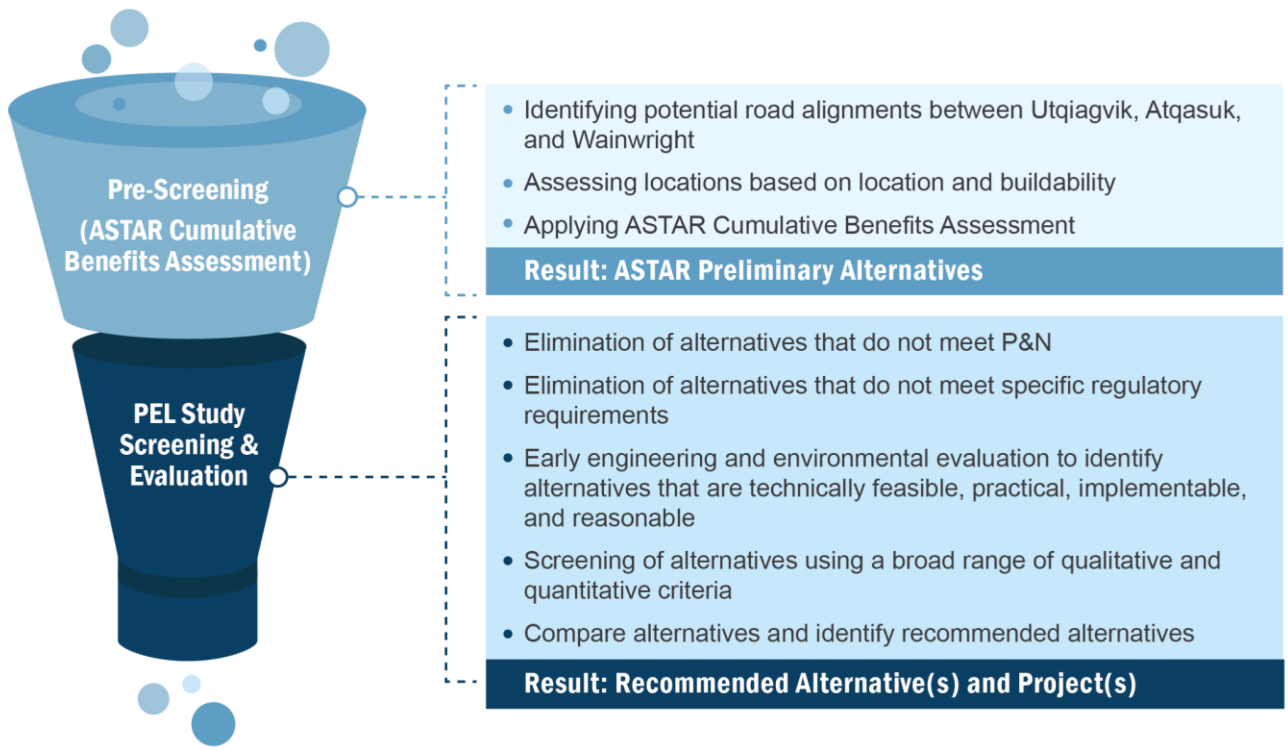

Figure 2: Alternative Screening Process

The alternatives under evaluation reflect potential all-season gravel road routes and were sited to align with likely river crossings and account for other natural features and constraints. Four corridors were identified that link Atqasuk, Wainwright and Utqiaġvik and are shown in Figure 3 below:

- Corridor A: Utqiaġvik to Atqasuk
- Corridor D: Coastal Route Extension
- Corridor E: Middle Route
- Corridor F: Southern Route

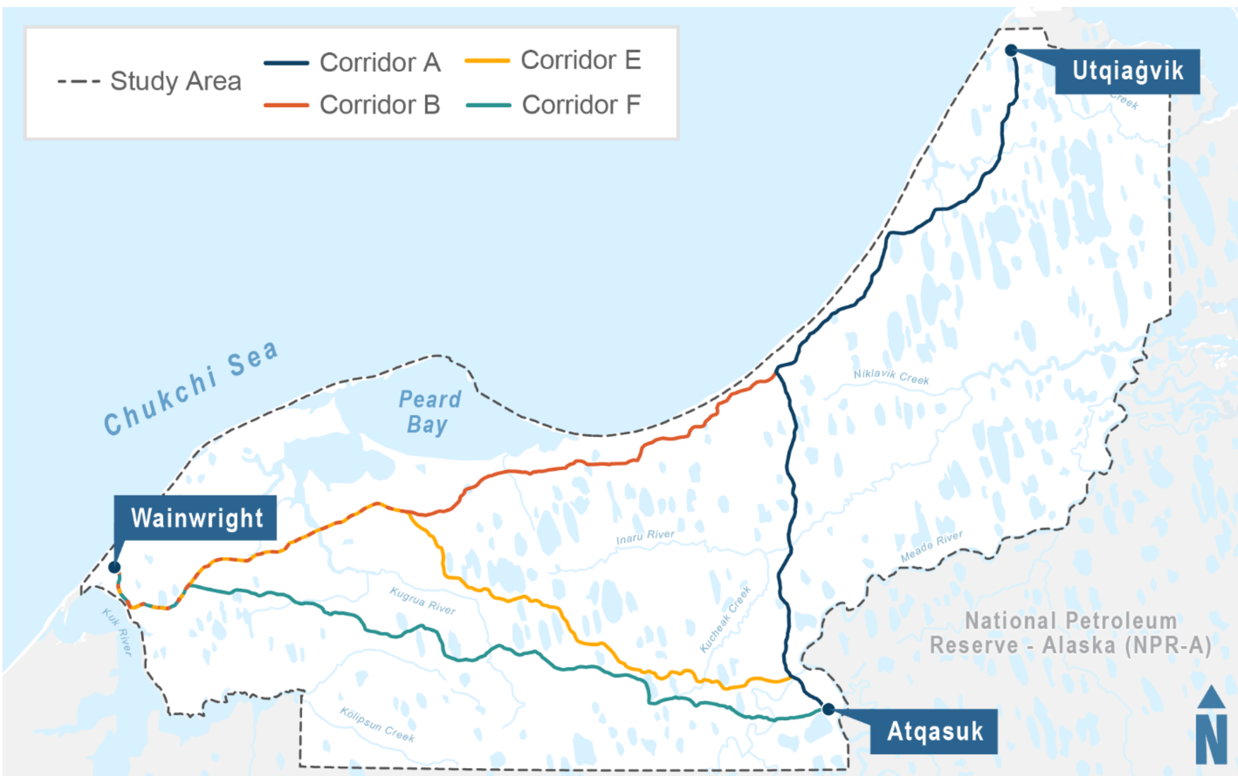

Figure 3: PEL Study Area Road Corridors

Corridors are not comparable as stand-alone road network alternatives therefore these corridors were further developed into six road network alternatives (henceforth referred to as alternatives) and will be advanced into engineering constraints and environmental-based criteria screening. A comparison of each alternative is summarized in Table 1 and shown in Figures 4 through 9.

Table 1: Alternatives Comparison

Alternative	Distance Between Communities (miles)			Total Network (road miles)
	Utqiaġvik and Atqasuk	Utqiaġvik and Wainwright	Wainwright and Atqasuk	
1	67	135	69	**135**
2	67	101	95	**131**
3	67	132	73	**136**
4	67	101	73	**171**
5	67	101	69	**190**
6	116	101	73	**144**

Figure 4: Alternative 1

Figure 5: Alternative 2

Figure 6: Alternative 3

Figure 7: Alternative 4

Figure 8: Alternative 5

Figure 9: Alternative 6

Engineering Constraints and Environmental-Based Criteria

The engineering constraints and environmental-based criteria screening process includes the following steps:

- Identify if resources will be potentially affected by an alternative, and to what extent
- Evaluate the key engineering challenges in a comparative analysis, or ranking of complexity according to engineering constraints
- Evaluate the costs of each alternative, logistical considerations, and technical feasibility
- Determine whether any of the alternatives would have substantially greater costs (monetary or environmental) without having substantially greater benefits

The following constraints, as described in Table 2, were selected as screening criteria as the differences in impacts between the alternatives will create meaningful separation when evaluating the alternatives against each other.

Table 2: Screening Criteria

Constraint	*To What Degree Does the Alternative…*
Protected Species	Impact K-1, K-2, and K-5 BLM setbacks. K-2 deep lakes are of particular importance to waterfowl, eiders, and yellow-billed loons.
Geology/ Geotechnical	Consider geology and geotechnical considerations, such as road construction in high heave/thaw areas that could significantly impact construction and maintenance costs. Additionally, extended travel distances to gravel resources would significantly increase transportation times and fuel costs.
Vehicle Bridges	Require the construction of bridges or culverts, which represent the vast majority of built infrastructure beyond the road itself. Significant differences exist between the road alternatives in the number, length, and cost of road infrastructure.
Subsistence Patterns	Potentially impact subsistence resources. This evaluation would encompass components of many criteria such as fish, wildlife, and waterfowl.
Wetlands	Avoid or minimize impacts to wetlands and especially sensitive wetlands.
Construction Cost Estimate	Minimize construction cost. This calculation is not intended to be interpreted as a financial construction quote, only as a method for evaluating environmental impacts and understanding at a planning level the potential costs of a route alternative. Significant components of the ASTAR project are unknown (such as gravel resources) which would likely significantly impact the final cost of the project.

Scoring Methods

Using the screening constraints selected above, environmental impacts and engineering constraints will be quantified according to the measurements listed and be ranked mathematically using standard deviations to represent the degree by which alternatives differ from each other. In this approach, a value of 1 corresponds to most favorable result and identifies the alternative(s) with the lowest impact. Higher scores will be assigned to alternatives that, in comparison to the lowest impact alternative, had progressively higher impacts. Essentially, a low score is desirable while a high score is undesirable as the score represents the extent of environmental impacts and engineering constraints.

Application of this scale can be generalized as follows in Table 3:

Table 3: Environmental-Based Criteria Screening

	Score	Impacts	Impacts Summary
Greater Impacts ↓	1	Lowest	Lowest identified impacts for that criteria.
	2	Moderately high	Impacts are noticeably above average and start to stand out.
	3+	High	These impacts are well above average and differ significantly from the lowest impact alternatives

To accomplish this quantitative comparison, standard deviations are used which demonstrate how far from the average a given impact is. For example, if Alternative 1 had the fewest impacts on protected species it would be assigned an impact of '1' while other alternatives would be given a score of 2 or 3 for the increase in impacts to protected species they respectively encounter. The scoring increases as the alternative impacts increases by factors of the calculated standard deviation. In the prior example, if Alternative 1 had the fewest impacts, and was assigned a value of 1, a value of 2 would be assigned for alternatives which had one standard deviation of impacts above the lowest (in this example, one standard deviation above the impacts of Alternative 1).

Weighting

According to information provided by the Advisory Committee, the screening criteria for environmental impacts and engineering constraints are not equal in importance, with some impacts holding greater significance. To address this, and to make sure that each Advisory Committee member's environmental and engineering priorities were represented, a weighted screening criteria was established which further refines the base score (described above as a 1 to 3 scale) by a multiplier. The range of weighting multiplier is on a similar 1-3 scale so that abnormally high multipliers do not overpower minor impacts to maintain objectivity; as would have been possible with a 1-6 scale, for example. Advisory Committee members were provided with Priority Ranking Worksheets on October 1st, 2025, and were asked to apply a numerical weight to each category. The priority screening options given to the Advisory Committee and Environmental Constraints those weighting scores were applied to are provided in Table 4 and 5 below, respectively.

Table 4: Environmental-Based Criteria Weight

	Multiplier	Priority	Weight Summary
Greater Importance ↓	1	Lowest	This criteria has a lower level of priority when compared to other criteria.
	2	Moderately high	This criteria is a higher priority consideration and should be given extra weighting.
	3	High	This criteria has the highest level of significance and these impacts are given the highest priority of consideration.

Table 5: Environmental-Based Criteria Matrix

Constraint	*To What Degree Does the Alternative…*	Measure	Weight
Protected Species*	Impact K-1, K-2, and K-5 BLM setbacks. K-2 deep lakes are of particular importance to waterfowl, eiders, and yellow-billed loons.	1-3	1-3
Geology/ Geotechnical	Consider geology and geotechnical considerations, such as road construction in high heave/thaw areas that could significantly impact construction and maintenance costs. Additionally, extended travel distances to gravel resources would significantly increase transportation times and fuel costs.	1-3	1-3
Vehicle Bridges	Require the construction of bridges or culverts, which represent the vast majority of built infrastructure beyond the road itself. Significant differences exist between the road alternatives in the number, length, and cost of road infrastructure.	1-3	1-3
Subsistence Patterns	Potentially impact subsistence resources. This evaluation would encompass components of many criteria such as fish, wildlife, and waterfowl.	1-3	1-3
Wetlands	Avoid or minimize impacts to wetlands and especially sensitive wetlands.	1-3	1-3

Constraint	*To What Degree Does the Alternative…*	Measure	Weight
Construction Cost Estimate	Minimize construction cost. This calculation is not intended to be interpreted as a financial construction quote, only as a method for evaluating environmental impacts and understanding at a planning level the potential costs of a route alternative. Significant components of the ASTAR project are unknown (such as gravel resources) which would likely significantly impact the final cost of the project.	1-3	1-3
*K-5 setbacks were added to Protected Species after a modification to alternative alignments. K-5 setbacks include coastal areas 1 mile inland from the coast and apply to all alternatives.			

Screening Application

Using the engineering constraints and environmental-based criteria, the impacts from the six alternatives were calculated using the scoring method outlined above. The result of this analysis is summarized below.

Protected Species

All alternatives encroach within NPR-A Record of Decision (ROD) K-1, K-2, and K-5 setbacks (BLM 2013). K-1 setbacks have been established around the Inaru River, Meade River, and Kugrau River rivers. K-2 setbacks have been established for two lakes in the southern portion of the project area which intersect five of the alternatives, excluding Alternative 2. All alternatives include portions of the alignment which intersect K-5 setbacks south of Utqiaġvik. Alternatives which continue to Wainwright along the coast, such as alternative 2, 4, 5, and 6, had greater K-5 impacts as they approached Peard Bay. Alternative 1 and 3 both divert south towards Atqasuk and avoid further Peard Bay area K-5 setbacks.

Protected species impacts are provided in Table 6 with Alternative 2 having the fewest protected species impacts while Alternative 5 had the greatest.

Table 6: Protected Species Impacts

Constraint	Road Network					
Protected Species	**1**	**2**	**3**	**4**	**5**	**6**
K-1 (Rivers) Setback Intersections	5	3	5	5	6	3
K-2 (Lakes) Setback Intersections	1	0	1	1	1	1
K-5 (Coastal) Setback Intersections	1	3	1	3	3	3

Geology/Geotechnical

Areas with high frost heave/thaw settle potential within the project area are common, however, there is considerable variability between the alternatives. Generally, those alternatives with coastal alignments, and shorter overall road distance, had fewer miles within areas identified to have high frost heave/thaw potential. Frost heave/thaw potential was calculated using terrain unit descriptions and were primarily associated with thaw lake deposits (terrain unit Qt) and marine sand deposits (terrain unit Qms).

Geology and geotechnical impacts are provided in Table 7 with Alternative 2 having the fewest miles in areas with high frost heave and thaw settling potential while Alternative 5 had the greatest.

Table 7: Geology/Geotechnical Impacts

Constraint	Road Network					
Geology/Geotechnical	**1**	**2**	**3**	**4**	**5**	**6**
High frost heave/thaw (road miles)	44	31	46	53	55	51

Vehicle Bridges

Built infrastructure impacts (such as water equalization pipes, culverts, and bridges) generally follows overall roadway mileage trends. Longer alternatives, such as 4, 5, and 6, generally have greater impacts than shorter alternatives, such as 1, 2, and 3. Vehicle bridge impacts are provided in Table 8.

Table 8: Vehicle Bridges Impacts

Constraint	Road Network					
Vehicle Bridges	1	2	3	4	5	6
Equalization pipes (count)	505	458	576	700	697	679
Culverts (count)	49	56	60	80	82	79
Bridges (count)	16	12	14	18	21	17

Subsistence Patterns

Subsistence resources in the project area are widespread and include marine resources (whales, seals and walrus), caribou and other furbearers, fish, birds, and plants (such as salmonberries). Large subsistence fishing areas exist near Peard Bak, Utqiaġvik, Atqasuk, and Wainwright. Plant gathering and marine subsistence activities taking place along the entire Chukchi Sea coastal area. Portions of the alignment which intersected subsistence resources were counted using information provided in the Arctic Slope Regional Corporation *Road Network for Utqiaġvik, Atqasuk, and Wainwright Technical Memorandum 10 – Subsistence.*

Subsistence platforms and cabins occur within the project area primarily along existing access routes; such as the Community Winter Access Trail and other seasonal trails. The greatest density of camps exists around Atqasuk near the Meade River. All alternatives come in close proximity to the same subsistence cabin north of Atqasuk.

Distinguishing factors between the six alternatives include impacts near Peard Bay (which alternatives 1 and 3 avoid) and the Kugrua River subsistence fishing area (which Alternative 1 avoids). For these reasons, Alternative 1 had the lowest anticipated impacts on subsistence resources, while Alternative 5 had the most. Subsistence impacts are shown in Table 9 below.

Table 9: Subsistence Impacts

Constraint	Road Network					
Subsistence Patterns	1	2	3	4	5	6
Proximity to subsistence resources (count)	4	6	5	6	7	6

Wetlands

Wetlands in the project area are widespread. Using the typical sections for the roadways, wetland impacts were quantified and provided in Table 10. As with other impacts, wetland impacts generally follow overall roadway lengths, with Alternative 2 having the fewest acres of wetlands impacted while Alternative 5 had the most.

Table 10: Wetland Impacts

Constraint	Road Network					
Wetlands	1	2	3	4	5	6
Wetland (acres)	806	739	793	990	1112	1196

Construction Cost Estimate

Construction costs associated with the alternatives were calculated using the combined total of labor, materials, subcontractors, equipment, and room/lodging. The total cost estimate for each alternative is provided in Table 11. Slight differences in the typical section exist and are described in greater detail in the PEL Study Report. Alternative 2 has the lowest overall cost of construction while Alternative 5 has the highest.

Table 11: Construction Costs

Constraint	Road Network					
Construction Cost	1	2	3	4	5	6
Cost (million dollars)	$812	$782	$870	$1,029	$1,139	$993

Using the information provided above, as outlined in Table 6 through 11, and summarized in Table 12, the standard deviation was calculated within the constraint across all six alternatives.

Table 12: Alternative Summary and Standard Deviation

	Alternatives						
Constraint	1	2	3	4	5	6	Standard Deviation
Subsistence Patterns	4	6	5	6	7	6	**1**
Cost	$812	$782	$870	$1,029	$1,139	$993	**$139**
Protected Species	7	6	7	9	10	7	**1.5**

Geology/ Geotechnical	44	31	46	53	55	51	**8.9**
Vehicle Bridges							
Equalization pipes	505	458	576	700	697	679	**105.3**
Major culverts	49	56	60	80	82	79	**14.3**
Bridges	16	12	14	18	21	17	**3.2**
Wetlands (acres)	806	739	793	990	1112	1196	**188.4**

Using the standard deviation found in Table 12, the road network impacts can be assessed as outlined in Scoring Method section and further summarized in Table 13.

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Table 13: Alternative Summary and Screening Scoring

	Road Networks						Stdev	Standard Deviation Scoring Cutoffs					Road Network Scoring					
Scoring Criteria	**1**	**2**	**3**	**4**	**5**	**6**	**σ**	1	2	3	4	5	**1**	**2**	**3**	**4**	**5**	**6**
Subsistence Patterns	4	6	5	6	7	6	1.03	4.0	5.0	6.1	7.1	8.1	1.0	2.9	2.0	2.9	3.9	2.9
Cost (million dollars)	$812	$782	$870	$1,029	$1,139	$993	$139	$782	$921	$1,060	$1,198	$1,337	1.2	1.0	1.6	2.8	3.6	2.5
Protected Species	7	6	7	9	10	7	1.5	6.0	7.5	9.0	10.5	12.0	1.7	1.0	1.7	3.0	3.7	1.7
Geology/ Geotechnical	44	31	46	53	55	51	8.9	30.7	39.6	48.5	57.5	66.4	2.4	1.0	2.7	3.5	3.7	3.3
Vehicle Bridges																		
Equalization pipes	505	458	576	700	697	679	105.3	458.0	563.3	668.5	773.8	879.0	1.4	1.0	2.1	3.3	3.3	3.1
Major culverts	49	56	60	80	82	79	14.3	49.0	63.3	77.6	91.8	106.1	1.0	1.5	1.8	3.2	3.3	3.1
Bridges	16	12	14	18	21	17	3.2	12.0	15.2	18.3	21.5	24.6	2.3	1.0	1.6	2.9	3.8	2.7
Wetlands (acres)	806	739	793	990	1112	1196	188	739	928	1,116	1,305	1,493	1.4	1.0	1.3	2.3	3.0	3.4

Summarizing the scoring results from Table 13, Table 14 shows the average score for each constraint which simplifies the numeric result of screening into a single number for Vehicle Bridges (average score of equalization pipes, major culverts, and bridges). As shown, Alternative 2 had the lowest overall impacts compared to the other five alternatives.

Table 14: Alternatives Screening Results

	Alternatives					
Constraint	**1**	**2**	**3**	**4**	**5**	**6**
Subsistence Patterns	1.0	2.9	2.0	2.9	3.9	2.9
Cost	1.2	1.0	1.6	2.8	3.6	2.5
Protected Species	1.7	1.0	1.7	3.0	3.7	1.7
Geology/ Geotechnical	2.7	1.0	2.3	2.7	3.4	2.2
Vehicle Bridges (averaged)	1.6	1.2	1.8	3.1	3.5	3.0
Wetlands (acres)	1.4	1.0	1.3	2.3	3.0	3.4
Score (rounded):	10	8	11	17	21	16

Seven members of the Advisory Committee provided responses to the Priority Ranking Worksheets (Atqasuk City Council, Iñupiat Community of the Arctic Slope, Native Village of Barrow, North Slope Borough, Olgoonik Corporation, Ukpeagvik Inupiat Corporation, and the Wainwright City Council). The responses from the Advisory Committee are summarized in Table 15 below and shown in order of highest to lowest (total) priority scoring.

Table 15: Advisory Committee Priority Ranking Responses

	Weight Response							
Constraint	**NVB**	**ICAS**	**ASRC**	**Atqasuk**	**UIC**	**WSC**	**Wainwright**	**Average**
Subsistence Patterns	3	2	3	3	1	3	3	2.57
Construction Cost Estimate	1	3	3	2	3	3	3	2.57
Protected Species	3	3	2	3	2	2	2	2.43
Geology/ Geotechnical	2	2	2	2	3	3	3	2.43
Vehicle Bridges	2	3	2	1	3	2	2	2.14
Wetlands	-	2	2	2	-	1	1	1.6

Summarizing the Priority Ranking responses, respondents gave, on average, a total of 13 points spread across the six constraint topics. The highest scored constraint (Subsistence Patterns) aligns closely with feedback received from other public participation opportunities, such as community meetings in Atqasuk, Utqiaġvik, and Wainwright.

Using the alternative quantitative impacts (Table 14) and the qualitative weighting responses from the Advisory Committee (Table 15), the weighted adjusted scoring for the road alternatives are shown in Table 16 below.

Table 16: Alternatives Weighted Scoring

Constraint	Weight Multiplier	Alternative Weighted Score 1	2	3	4	5	6
Subsistence Patterns	2.57	2.57	7.453	5.14	7.453	10.023	7.453
Construction Cost Estimate	2.57	3.084	2.57	4.112	7.196	9.252	6.425
Protected Species	2.43	4.131	2.43	4.131	7.29	8.991	4.131
Geology/ Geotechnical	2.43	6.561	2.43	5.589	6.561	8.262	5.346
Vehicle Bridges	2.14	3.424	2.568	3.852	6.634	7.49	6.42
Wetlands	1.6	2.24	1.6	2.08	3.68	4.8	5.44
	Weighted Score (rounded):	22	19	25	39	49	35

With the Advisory Committee weighted scoring applied to the screening results, Alternative 1, 2, and 3 generally scored the lowest among the six alternatives. Alternatives 4, 5, and 6 scored substantially higher than other networks as they are the three longest alternatives and have greater environmental impacts than the other options; specifically, these three alternatives scored the highest in the Construction Cost Estimate constraint which also had a high weighting multiplier applied to it.

Evaluating the engineering and environmental-based impacts of the six road alternatives, Alternative 2 had the fewest impacts while Alternative 5 had the most. As indicated by the weighted adjusted scoring, and calculated in Table 17 below, alternatives 1, 2, 3 scored within one standard deviation of each other while alternatives 4, 5, and 6 scored over two standard deviations.

Constraint	Alternative 1	2	3	4	5	6	Standard Deviation
Weighted Score	22	19	25	39	49	35	11.6
Standard Deviations	1.3	1.0	1.6	2.8	3.6	2.4	

It is recommended that alternative 1, 2, and 3 be advanced to the NEPA review and alternative 4, 5, and 6 be removed from future consideration; unless otherwise reintroduced through public participation or further qualitative interests present themselves.