

# Technical Memorandum

## Recommended Alternative Selection Criteria

To: Marie Heidemann, Project Manager, Alaska Department of Transportation and Public Facilities  
From: Steve Noble PE, Project Manager, DOWL  
Date: February 17, 2023  
Project: Juneau Douglas North Crossing PEL Study  
Project Numbers: SFHWY00299/0003259

### PEL Study Description

The Alaska Department of Transportation and Public Facilities (DOT&PF) in cooperation with City and Borough of Juneau (CBJ) is studying a possible transportation corridor to connect Juneau with the north end of Douglas Island. A connection has been studied since the 1980s but has not progressed beyond identification and recommendation of preliminary alternative alignments. The previous studies highlighted several reasons for a north crossing:

- Congestion during peak periods on the existing Douglas Island Bridge
- Concerns about safety and emergency response in the event of a bridge closure
- The potential for residential, commercial, industrial, and port development at west Douglas Island

DOT&PF has chosen to use the Planning and Environmental Linkages (PEL) process to identify and evaluate a purpose and need (P&N) and recommend alternatives for connecting Juneau with the northern end of Douglas Island. The PEL process will provide opportunities for public input and involvement. The analyses conducted may be incorporated into a future National Environmental Policy Act (NEPA) process.

The study area boundary, where the proposed crossing may be located, is shown in Figure 1. The study area encompasses the area where prior studies and community outreach identified potential alternative crossing locations.

## Purpose of the Technical Memorandum

This technical memorandum describes the alternative screening process used for the alternative selection during the Juneau Douglas North Crossing PEL Study (Project Numbers: SFHWY00299/0003259).

The alternative screening process provides critical information about how well an alternative satisfies a proposed project's purpose and if it will meet the transportation needs of its users. If an alternative does not meet the project's P&N, it will be eliminated. Also, the screening process will determine if an alternative follows adopted planning documents, is technically implementable and constructable from an engineering perspective, and is financially feasible, as well as reasonable under the National Environmental Policy Act (NEPA), practicable under the Clean Water Act, and prudent and feasible under Section 4(f) of the Department of Transportation Act of 1966.

The alternative screening process is designed to accommodate the development of new alternatives throughout the PEL process and will be applied to all alternatives to give confidence all alternatives are evaluated consistently.

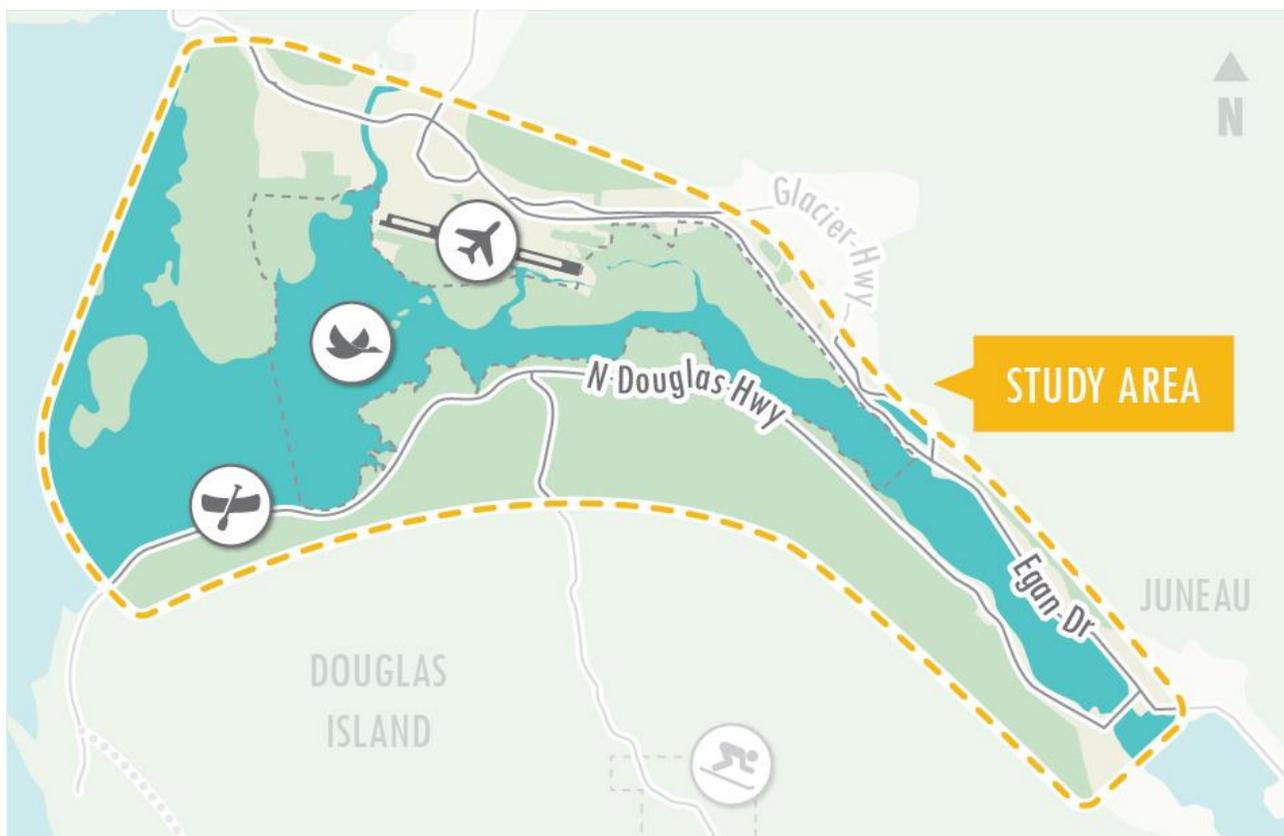
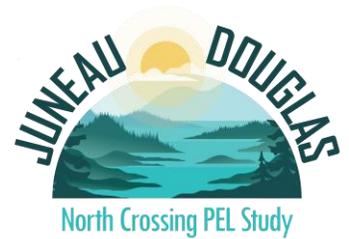


Figure 1: Study Area



## Alternative Selection Process

The screening process is a decision-making framework to determine how well each alternative meets the 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).

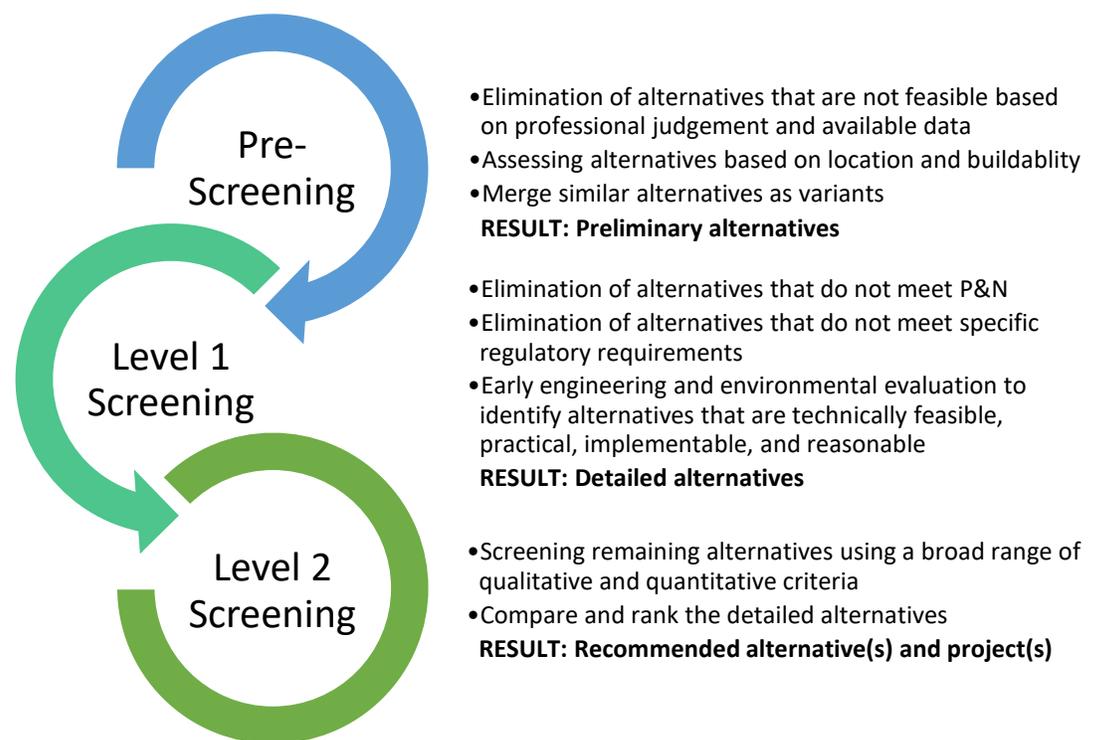
An iterative step alternative selection process is planned for this PEL Study as described below. Further details defining criteria and methods for each screening step are provided in later sections of this memorandum.

### The alternatives development and screening process uses the following steps:

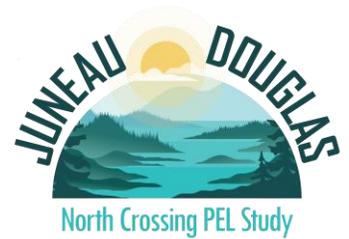
- 1. Develop the purpose and need statement.** The purpose and need statement states why the project is being proposed (the purpose) and describes the key problems to be addressed and underlying causes (the need). The P&N statement guides the development of the alternatives and is the primary focus of the alternative screening criteria. The DOT&PF Statewide Environmental Office (SEO) concurred with the purpose and need statement on November 16, 2022.
- 2. Compile possible alternatives.** Alternatives are based on the P&N statement and relevant information from baseline studies, public and agency input, and local and regional land use and transportation plans. Conduct an Alternatives Development Workshop with participants from the TAC and STAC to develop a range of draft alternatives.
- 3. Pre-screening.** Early evaluation based on available data and professional judgment to eliminate alternatives that are not feasible based on location and buildability. Draft alternatives that have similar characteristics will be grouped as variants of a single alternative during this step. Alternatives remaining after the pre-screening will be considered “preliminary alternatives”.
- 4. Apply Level 1 screening.** Two-step screening of the preliminary alternatives based on the P&N, additional goals, and other considerations. Alternatives that do not pass Level 1 screening will not advance for further alternative development or evaluation. Alternatives remaining after the Level 1 screening will be considered “detailed alternatives”.
- 5. Refine and conduct preliminary engineering.** The detailed alternatives will be refined and preliminary engineering performed to increase the level of detail including modifications to respond to environmental constraints or improve constructability.

6. **Apply Level 2 screening.** Screening of the detailed alternatives using a broad range of qualitative and quantitative criteria including the cost of the alternatives, wetland impacts, right-of way (ROW) impacts, impacts to important habitat, conservation lands, historic or cultural resources. The goal is to compare and rank the detailed alternatives and to identify recommended alternative(s).
7. **Further refine the recommended alternatives.** Refinements include avoiding and minimizing impacts and designing to a higher level of detail to resolve technical issues and prepare cost estimates.
8. The screening results will be documented in the PEL Study and PEL Questionnaire.

Tables 1 and 2 (see below) summarize the Level 1 and Level 2 screening criteria. The screening process is summarized in the following figure:



**Figure 2: Alternatives Screening Process**



## Identifying Screening Criteria

The alternative screening and selection criteria are established before any alternatives are evaluated to make sure each alternative is examined consistently and without bias. The selection criteria are the basis for the selection and advancement of alternatives to detailed alternative development, and ultimately the identification of recommended alternatives. The screening for both levels is based on the purpose and need statement and additional goals. Other considerations were added based on regulatory requirements (see Attachment A), the environmental setting of the study area (see Attachment B), and comments received from the advisory committees and the public.

Screening takes place at two levels, with the selection criteria at each level becoming increasingly more focused on how well the alternatives meet the P&N and additional goals. A “no build” alternative is carried through all levels of screening to provide a baseline for the evaluation of the alternatives. The following sections discuss the two screening levels in more detail, as well as the selection criteria in each level.

### Purpose and Need

The following P&N statement is the starting point for developing screening criteria:

#### **Purpose**

The purpose of the Juneau Douglas North Crossing PEL Study is to identify ways to improve the connection between Douglas Island and Juneau. The secondary purposes are to identify ways to improve transportation for non-motorized users and reduce transportation related energy consumption.

#### **Need**

An improved connection to Douglas Island should address the following needs:

#### **Alternate access and transportation infrastructure resiliency**

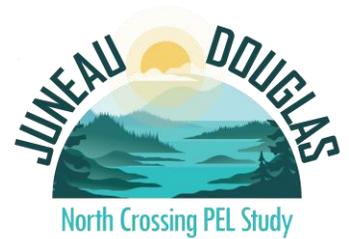
The community has expressed concerns regarding the lack of alternate access during emergencies and the City and Borough of Juneau (CBJ) has identified the issue in the 2013 Comprehensive Plan. In the event of the Douglas Island Bridge or another single route travel corridor in the area (North Douglas Highway or Egan Drive) being inaccessible or out of service, emergency response would be delayed, and residents cut off from the access to workplaces and critical resources.

#### **Decrease traffic pressure on Douglas Island Bridge and its intersections**

The traveling public is currently experiencing delays and congestion on the Douglas Island Bridge and its intersections during the peak travel times. Analyses indicate that the intersections operate at or over capacity during peak travel times and will continue to deteriorate based on estimated future traffic counts.

#### **Additional goals**

The identified alternative(s) should also strive to meet these additional goals:



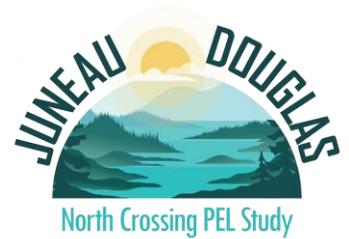
- Improve connection to North and West Douglas Island by creating additional traffic capacity to support the future development of affordable housing and economic development opportunities.
- Enhance and protect the public health and safety of travelers and the communities that transportation facilities traverse and serve.
- Transportation improvements should avoid, minimize, and mitigate impacts to the environment and to residential areas.
- Transportation improvements should maintain the visual, cultural, and scenic identity of Juneau and Douglas Island.

## Design Criteria Assumptions

The new crossing will create additional access between Douglas Island and Juneau (mainland). Access will be provided at an intersection either along North Douglas Highway or an adjoining side street, and a location on the mainland to be identified as part of the alternative development and refinement process. The crossing will be designed with a 30 to 45 mph design speed, two 12-ft wide travel lanes, 6-ft wide shoulders, and sidewalks or a shared use pathway on both sides of the bridge. The crossing will be designed with a 75-year design life.

## Pre-screening

Pre-screening will assess the draft alternatives to determine if they are feasible based on location (e.g., impacts to airport operations) and buildability (design considerations). Draft alternatives that have similar characteristics will be grouped as variants of a single alternative during this step. Draft alternatives will be screened using readily available data and the professional judgment of the project team. At the completion of the pre-screening process, preliminary alternatives will be recommended to move forward for further analysis and evaluation.



## Level 1 Screening Criteria and Methodology – Preliminary Alternatives

The goal of the Level 1 screening is to evaluate whether preliminary alternatives meet the P&N and specific regulatory requirements. Early engineering and analysis will be performed to confirm whether the alternatives are technically feasible, practical, implementable, and reasonable. A “no build” alternative is carried forward through the screening process.

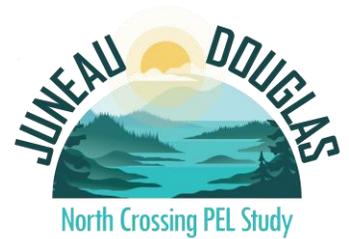
Level 1 screening is completed with minimal additional data collection. In Step 1, pass/fail criteria will be used to determine whether an alternative meets the P&N. An alternative that fails to meet the P&N, and therefore does not lead to an implementable solution, is removed from further consideration. During Step 2 of the Level 1 screening, criteria will be used to evaluate the extent to which the remaining alternatives meet the additional goals (see Table 1 for details) and against criteria from the following areas: Natural Environment, Social, Housing, Economic, Safety, and Public Support. The alternatives are evaluated based on their response to the criteria, with alternatives that are most promising advancing to detailed alternative development. The decision of which alternatives ultimately advance to detailed alternative development will be based on professional judgement. Dependent on the results of screening, alternatives will be recommended to advance to detailed alternative development.

**Table 1: Level 1 Screening Criteria**

<b>Step 1 - Purpose and Need (pass / fail based on yes / no answer)</b>			
<b>Category</b>	<b>Criteria</b>	<b>Description</b>	<b>Measure</b>
<b>Purpose and Need</b>	Provide alternate access and transportation infrastructure resilience	The alternative provides alternate access between Juneau and Douglas Island and improves the transportation infrastructure resilience	yes / no
	Improve transportation for non-motorized users	The alternative includes improvements for non-motorized users	yes / no
	Reduce transportation related energy consumption	Reduces travel times based on O / D Study	yes / no
	Decrease traffic pressure on Douglas Island Bridge and its intersections	Improves LOS during AM and PM peaks at existing bridge and alternative	yes / no
	Improve emergency response times	Reduces estimated travel time between the hospital/fire department and Douglas Island properties	yes / no
	Improve access to critical healthcare and emergency services	Provides access during bridge or another single route closure	yes / no
	Improve access to workplaces and critical resources	Provides access during bridge or another single route closure	yes / no
<b>Step 2 - Additional Goals</b>			
<b>Category</b>	<b>Criteria</b>	<b>Description</b>	<b>Measure</b>
<b>Additional Goals</b>	Improve connection to North and West Douglas Island by creating additional traffic capacity to support the future development of affordable housing and economic development opportunities	High: significant improvement Medium: some improvement Low: no discernible improvement	high / medium / low
	Enhance and protect the public health and safety of travelers and the communities that transportation facilities traverse and serve	High: significant likelihood Medium: some likelihood Low: no discernible likelihood	high / medium / low
	Avoid, minimize, and mitigate impacts to the environment	High: potential to avoid impacts Medium: potential to minimize or mitigate impacts Low: not likely to avoid, minimize or mitigate impacts	high / medium / low

	Avoid, minimize, and mitigate impacts to residential areas	High: potential to avoid impacts Medium: potential to minimize or mitigate impacts Low: not likely to avoid, minimize or mitigate impacts	high / medium / low	
	Maintain the visual, cultural, and scenic identity of Juneau and Douglas Island	High: significant likelihood Medium: some likelihood Low: no discernible likelihood	high / medium / low	
Other Considerations				
Category	Criteria	Potential Benefit, Issue, or Impact	Description	Measure
Natural Environment	Waterbody, wetland, riparian, or flood hazards directly impacted	Mitigation, Permitting	Area impacted	yes / no
	Hydrologic connectivity impacted		Connectivity affected	yes / no
	Important migratory bird habitat impacted		Habitat impacted	yes / no
	Wildlife, fish, essential fish or T&E habitats impacted	Consultation	Habitats impacted	yes / no
	Contaminated sites directly affected	Permitting, Clean-up	Contaminants	yes / no
	Impervious surfaces added		New surface constructed	yes / no
	Protected (conserved lands, refuge) lands directly affected	Mitigation, Permitting	Area affected	yes / no
	Use of Section 4(f) / 6(f) protected lands	Mitigation, Permitting	Land used	yes / no
Social	Within 100 ft of an EJ community, a school, or a community gathering space	Noise / air / viewshed impact	Distance to EJ community, school, or a community gathering space	yes / no
	A neighborhood is divided or otherwise disrupted		Neighborhood name	yes / no
	Consistent with plan policies and development code		Local plan / policies	yes / no
Housing	Residential uses directly affected	Loss of property, relocation	ROW needed	yes / no
	Within 100 ft of residential properties	Noise / air / viewshed impact	Distance to residential properties	yes / no

	Potential to improve access to developable land	Opens up land for development	Access provided	yes / no
<b>Economic</b>	Commercial uses directly affected	Loss of property, relocation, commercial use access	ROW needed	yes / no
	Within 100 ft of commercial uses	Noise / air impact	Distance to commercial uses	yes / no
	Potential to improve access to developable land	Opens up land for development	Access provided	yes / no
<b>Safety</b>	Improve safety for all users		Safety improved	yes / no
<b>Constructability</b>	A crossing can be built in this location based on construction knowledge and experience in planning and design		Professional judgment on whether an alternative can be built	yes / no
<b>Cost</b>	Estimated construction cost		Professional judgment on expected construction cost	high / medium / low
	Estimated maintenance cost / effort		Professional judgment on expected maintenance cost / effort	high / medium / low
<b>Public Support</b>	Level of public support		Comments in support of a preliminary alternative	high / medium / low



## Level 2 Screening Criteria and Methodology – Detailed Alternatives

Engineering and environmental analysis will be conducted to refine the detailed alternatives to address constraints, minimize impacts, improve constructability, and create a construction cost estimate for each alternative. Level 2 screening will then be applied to identify which detailed alternatives remain as recommended alternatives.

Level 2 screening will apply a broad range of qualitative and quantitative criteria. The screened areas include all parts of an alternative, including the crossing, the tie-ins to the existing network, and recommended improvements to existing roads. The result will give an overview of the costs and impacts and enable a comparison of the screened alternatives. A “no build” alternative is carried forward through the screening process.

Level 2 screening includes the following steps:

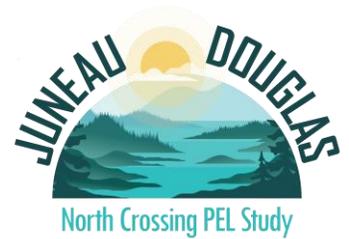
- Estimate the constraints placed on the alternatives by various resources (acres of residential, commercial etc. land uses)
- Identify if resources, and to what extent, will be potentially affected by an alternative (acres of wetland impacted, streams crossed, etc.)
- Evaluate the costs of each alternative (including costs for construction, mitigation, and annual maintenance), logistical considerations, and technical feasibility
- Determine whether any of the alternatives would have substantially greater costs without having substantially greater benefits

During Level 2 the detailed alternatives are screened on how well they meet the P&N and the additional goals and evaluated against quantitative criteria from the following areas: Natural Environment, Social, Housing, Economic, Safety, Cost, ROW, and Public Support. The alternatives are scored based on quantitative evaluation (acreage, cost, amounts) where possible, and some qualitative ratings. This evaluation will assist to identify the recommended alternative(s).

**Table 2: Level 2 Screening Criteria**

<b>Purpose and Need and Additional Goals</b>			
<b>Category</b>	<b>Criteria</b>	<b>Measurement</b>	<b>Method</b>
<b>Purpose and Need</b>	Improve transportation for non-motorized users	Planned pedestrian and bicycle lanes tie into existing network and improve access and safety for non-motorized users.	yes / no
	Reduce transportation related energy consumption	Estimated change in travel times based on travel origins and destinations	O-D Study
	Decrease existing and future traffic congestion on Douglas Island Bridge and its intersections	Estimated LOS during AM and PM peaks at existing bridge and alternative	O-D Study
	Improve emergency response times	Minutes of estimated travel time reduction between the hospital/fire department and Douglas Island residents	O-D Study / GIS
	Improve access to critical healthcare and emergency services	Provides access during bridge or another single route closure	yes / no
	Improve travel times to workplaces and critical resources	Minutes of estimated travel time reduction	O-D Study
<b>Additional Goals</b>	Improve connection to North and West Douglas Island by creating additional traffic capacity to support the future development of affordable housing and economic development opportunities	High: significant improvement Medium: some improvement Low: no discernible improvement	high / medium / low
	Enhance and protect the public health and safety of travelers and the communities that transportation facilities traverse and serve	High: significant likelihood Medium: some likelihood Low: no discernible likelihood	high / medium / low
	Avoid, minimize, and mitigate impacts to the environment	High: potential to avoid impacts Medium: potential to minimize or mitigate impacts Low: not likely to avoid, minimize or mitigate impacts	high / medium / low
	Avoid, minimize, and mitigate impacts to residential areas	High: potential to avoid impacts Medium: potential to minimize or mitigate impacts Low: not likely to avoid, minimize or mitigate impacts	high / medium / low
	Maintain the visual, cultural, and scenic identity of Juneau and Douglas Island	High: significant likelihood Medium: some likelihood Low: no discernible likelihood	high / medium / low
<b>Other Considerations</b>			
<b>Natural Environment</b>	Wetlands directly affected	Acreage impacted by construction	GIS
	High value wetlands affected	Type of wetlands impacted by construction	GIS
	Intertidal zone directly affected	Acreage impacted by construction	GIS

	Stream and riparian habitat directly affected	Acreage of impacted streams (including buffer)	GIS
	Essential fish habitat (EFH) directly affected	Construction impacts (including noise)	GIS
	Wildlife habitat directly affected	Acreage impacted by construction	GIS
	Anadromous streams impacted	Number of streams	GIS
	T&E habitat directly affected	Acreage OR distance to habitat	GIS
	Important migratory bird habitat impacted	Acreage impacted by construction	GIS
	Eagle nesting trees directly affected	Number of historic nesting locations	Database
	Contaminated sites directly affected	Number AND type AND acreage	GIS
	Section 4(f) / 6(f) resources affected	Number AND distance	GIS
	Protected lands directly affected	Acreage impacted by construction	GIS
	Impervious surfaces added	Area of added impervious surfaces	GIS
	Effect on visual or scenic quality of surrounding area	Qualitative Measure	yes / no
<b>Social</b>	EJ community, school, or community gathering space directly affected	Number AND distance	GIS
	Neighborhood divided or otherwise disrupted	Area impacted AND number	GIS
	Distance to a native allotment	Distance	GIS
<b>Housing</b>	Residential uses directly affected	Estimated number	GIS
	Within 100 ft of residential property	Estimated number	GIS
	Acres of vacant residential land directly affected	Acreage of developable land acquired	GIS
<b>Economic</b>	Commercial uses directly affected	Estimated number	GIS
	Within 100 ft of commercial uses	Estimated number	GIS
	Acres of vacant commercial land directly affected	Acreage of developable land acquired	GIS
<b>Safety</b>	Improves safety for all users	Number of conflict points between users	Total number
<b>Cost</b>	Estimated total construction cost	Estimated cost	Estimate in \$
	Estimated annual maintenance cost	Estimated cost	Estimate in \$
<b>Right of Way (ROW)</b>	Total ROW needed	Acres and number of parcels (full and partial)	GIS
	Residential property acquisition	Acres and number of parcels	GIS
	Commercial property acquisition	Acres and number of parcels	GIS
<b>Public Support</b>	Level of public support	Comments received	Database



## APPENDIX A

### Regulatory Requirements

The following regulatory requirements can lead to elimination of an alternative during the pre-screening (fatal flaw screening).

#### NEPA Regulations and Council on Environmental Quality Guidance

According to NEPA regulations and guidance issued by the Council on Environmental Quality, there are three primary reasons why an alternative might be determined to be not reasonable and eliminated from further consideration.

1. The alternative does not satisfy the purpose and need of the project (evaluated during the pre-screening)
2. The alternative meets the purpose and need of the project but is unreasonable based on a combination of other factors such as cost, environmental impacts, or its inability to meet permitting or other regulatory requirements (evaluated during the Level 1 screening).
3. The alternative substantially duplicates another alternative; that is, it is otherwise reasonable but offers little or no advantage for satisfying the project's purpose, and it has impacts and/or costs that are similar to or greater than those of other, similar alternatives (evaluated during the Level 2 screening).

#### Clean Water Act Requirements

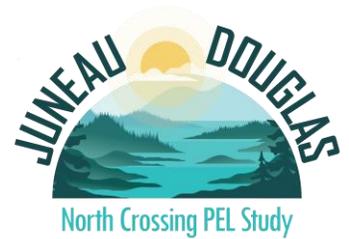
The areas of all possible crossing locations support federally regulated wetlands or other waters of the United States and therefore, the Clean Water Act Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 Code of Federal Regulations 230) and Executive Order 11990, Protection of Wetlands, need to be considered during the alternative development phase.

The U.S. Army Corps of Engineers is responsible for determining compliance with the Section 404(b)(1) Guidelines and may permit only the least environmentally damaging practicable alternative.

The Section 404(b)(1) Guidelines state that “no discharge of dredged or fill material (to Section 404– regulated waters) shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences” [Section 230.10(a)].

This section of the guidelines further states that:

1. For the purpose of this requirement, practicable alternatives include but are not limited to: a. Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters; b. Discharges of dredged or fill material at other locations in waters of the United States or ocean waters.
2. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an



area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered.

3. Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in Subpart E of the guidelines) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not water dependent), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise. To achieve compliance with the Section 404(b)(1) Guidelines, the evaluation of alternatives will need to demonstrate the alternative selected is the least environmentally damaging practicable alternative.

### Section 4(f)/Section 6(f) Requirements

Section 4(f) of the Department of Transportation Act of 1966 (49 USC Section 303) applies to publicly owned parks, recreation areas, wildlife and waterfowl refuges, and publicly or privately owned significant historic properties. The requirements of Section 4(f) apply only to agencies within the U.S. Department of Transportation (USDOT). Section 4(f) prohibits USDOT agencies from approving the use of any Section 4(f) land for a transportation project, except as follows:

- First, the USDOT agency can approve the use of Section 4(f) land by making a determination that (1) there is no prudent and feasible alternative that would avoid the use of the Section 4(f) resource and (2) the project includes all **possible** planning to minimize harm to that property.
- Second, the USDOT agency can approve the use of Section 4(f) property by making a finding of de minimis impact for that property.

Section 6(f) of the Land and Water Conservation Act requires that the conversion of lands or facilities acquired with Land and Water Conservation Act funds be approved by the U.S. Department of Interior. Approval requires “substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.”

An alternative that would not be available because of the severity of Section 4(f) or Section 6(f) impacts could be eliminated during Level 2 screening. To achieve compliance with the Section 4(f) regulations, it will need to be demonstrated, through an evaluation of alternatives that either (1) the alternative selected would have a de minimis use of Section 4(f) resources or (2) there is no feasible and prudent alternative that would avoid the use of Section 4(f) resources, and the project includes all possible planning to minimize harm to Section 4(f) resources.

## APPENDIX B

### Memos and Data Summaries

Resource technical memoranda, data summaries, and maps were prepared through a desktop analysis to provide a general overview of environmental, social, and historic/cultural conditions in the study area. The Environmental Setting Report (DOWL 2022) provides a basic description of the human and natural environment as well as the built environment within the study area. The following resources were included:

- **Socioeconomics:** Summary and mapping of population and economic projections, social groups and community cohesion including the change of demographics over time, environmental justice, transit, and schools.
- **Land Use Designations:** Summary and mapping of existing land use, zoning, and ownership, including an overview of land use plans and transportation plans, native allotments, and Section 4(f) and Section 6(f) resources.
- **Historic and Cultural Resources:** Summary and mapping of historic and cultural resources within the study area.
- **Geologic and Geotechnical Considerations:** Summary and mapping of surface geology and test borings.
- **Hydrology, Water Quality, and Floodplains:** Summary and mapping of the hydrologic characteristics including waterbody types, watershed boundaries, floodplains, impaired waterbodies, and navigable waters.
- **Wetlands:** Summary and mapping of wetlands, waterbodies, and waterways identified within the study area.
- **Threatened or Endangered Species:** Summary of species listed under the Section 7 of the Endangered Species Act (ESA).
- **Fish and Wildlife:** Summary and mapping of aquatic species and essential fish habitat, anadromous streams, habitat areas for upland species, and other species habitat within the study area, and of fish passage issues. A description of marine mammals, land mammals, amphibians, and birds.
- **Invasive Species:** Summary and mapping of invasive species.
- **Transportation Infrastructure (including Transportation Network and Aviation):** Summary and mapping of the transportation network including the functional classification of roadways and aviation including airport approaches.
- **Contaminated Sites:** Summary and mapping of known contaminated sites within the study area.
- **Noise:** Summary and mapping of sensitive noise receivers.
- **Air Quality and Climate Change:** Summary of air quality and climate change effects.
- **Visual Effects:** Mention of the need to determine an area of visual effect if a preferred alternative would be selected.
- **Utilities:** Summary and mapping of utilities including electrical transmission lines, light poles, and the water network.