WINDY CORNER ENVIRONMENTAL ASSESSMENT

APPENDIX E

SECTION 4(F) CONSULTATION

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ALASKA RAILROAD

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Effinger, Bob A (DOT)

From: Dietrick, Matthew V (DOT)
Sent: Monday, December 16, 2019 5:08 PM
To: Effinger, Bob A (DOT)
Cc: Elliott, Brian A (DOT); Schmid, Tom J (DOT); Roadifer, Carol J (DOT)
Subject: SEO Section 4(f) Determination RE: Section 4(f) Consultation - ALASKA RAILROAD,, CFHWY00265, MP 105 to MP 107, Windy Corner Improvements project
Attachments: Proposed Action - Alternative 2A.JPG; 56631 Seward Windy Corner SHPO findings ltr 1-15-15.pdf; 55631 Seward Windy Corner SHPO concur 2-6-15.pdf

Bob

4(f) Applicability Determination
The Alaska Railroad is a transportation facility eligible for the National Register of Historic Places. As a result of consultation under 23 CFR 800.5, it was determined that the project activities will not adversely affect the historic qualities of the Alaska Railroad that make it eligible for listing on the National Register of Historic Places. SHPO's concurrence was obtained on February 6, 2015. Therefore, the project meets the conditions for the exception to Section 4(f) approval found in 23 CFR 774.13(a)(3) – The maintenance, preservation, rehabilitation, operation, modernization, reconstruction, or replacement of historic transportation facilities that are on or eligible for the National Register.

DOT&PF has determined that the proposed project meets an exception to a Section 4(f) approval. Therefore, the requirements of Section 4(f) do not apply.

The consultation contains several project numbers that do not appear to apply to the Windy Corner project, see red text below. Given the context of all other information, it is clear which project the consultation is for and no revisions are necessary. Please ensure future consultations are revised accordingly and place a copy of this email in the project file.

Regards
Matt

Matt Dietrick
DOT&PF NEPA Program Manager
269-6229

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

From: Effinger, Bob A (DOT)
Sent: Friday, December 13, 2019 3:36 PM
To: Dietrick, Matthew V (DOT) <matthew.dietrick@alaska.gov>
Cc: Elliott, Brian A (DOT) <brian.elliott@alaska.gov>; Schmid, Tom J (DOT) <tom.schmid@alaska.gov>; Roadifer, Carol J (DOT) <carol.roadifer@alaska.gov>
Subject: Section 4(f) Consultation - ALASKA RAILROAD,, CFHWY00265, MP 105 to MP 107, Windy Corner Improvements project

Matt,

In the emails below CR Region consulted with SEO regarding the proposed Section 4(f) use of Chugach State Park as part of the Windy Corner Project (CFHWY00245). The project also involves effects to a second Section 4(f) property, the Alaska Railroad.

The project would realign 2 miles of the 36.6-mile Turnagain Arm District of the Alaska Railroad (ANC-04057). See attached Proposed Action Figure. As a result of Section 106 consultation it was confirmed that this segment of the Alaska Railroad is eligible for the National Register of Historic Places and that the Windy Corner project would have no adverse effect on ANC-04057. The reconstructed single track railroad would contain the same basic features as before and would replace in-kind materials. SHPO concurred in their 2/6/2015 letter (attached) that the project would have no adverse effect on ANC-04057.

Although the 1/15/2015 Section 106 findings letter (attached) from DOT&PF to SHPO indicated that there was intent to make a Section 4(f) de minimis impact finding regarding ANC-04057, to cover this possibility, after review, it seems apparent that the 23 CFR 774.13(a)(3) exception to the requirement for Section 4(f) approval applies.

Item (3) of the 23 CFR 774.13(a) notes a Section 4(f) exception applies for:

(3) Maintenance, preservation, rehabilitation, operation, modernization, reconstruction, or replacement of historic transportation facilities, if the Administration concludes, as a result of the consultation under 36 CFR 800.5, that:

(i) Such work will not adversely affect the historic qualities of the facility that caused it to be on or eligible for the National Register, or this work achieves compliance with Section 106 through a program alternative under 36 CFR 800.14; and

(ii) The official(s) with jurisdiction over the Section 4(f) resource have not objected to the Administration conclusion that the proposed work does not adversely affect the historic qualities of the facility that caused it to be on or eligible for the National Register, or the Administration concludes this work achieves compliance with 54 U.S.C. 306108 (Section 106) through a program alternative under 36 CFR 800.14.

- The proposed railroad improvement falls under the description of work in (3)
- Such work has received a finding of no adverse effect under Section 106 which satisfies (i)
- SHPO, as the official with jurisdiction over historic Section 4(f) resources, did not object (concurred) in there 2/6/2015 letter with the conclusion of no adverse effect which satisfies (ii)

As a result, CR DOT&PF requests your agreement that the projects affects to ANC-04057 fall under the Section 4(f) exception 23 CFR 774.13(a)(3) and no Section 4(f) *de minimis* finding is needed.

Bob Effinger
Environmental Analyst
Preliminary Design and Engineering
Alaska DOT&PF Central Region
907.269.0531

CHUGACH STATE PARK

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Section 4(f) Evaluation and Approval
for

Transportation Projects That Have a Net Benefit to a Section 4(f) Property

For NEPA Assignment Program Projects

Project Name: Seward Highway, MP 105-107 Windy Corner Improvements
Project Numbers (Federal and State): 0A31034/Z566310000
Section 4(f) Resource: Chugach State Park
This Section 4(f) properties is a:
☒ Parks+ property (skip Section III)
☐ Historic property (complete Section III)

Date: 2/26/2020
List of Attachments:
Figure 1, Project Location & Vicinity Map;
Figure 2, Proposed Action - Plan View;
Figure 3, Proposed Action Typical Cross-Section;
Figure 4, Mountainside Park Facility Improvements;
Figure 5, Right-of-Way or Easement Acquisition and Relinquishment;
Figure 6, Existing Facilities and Features between MP 104-109 Seward Highway;
Figure 7, Goat's Head Soup Climbing Routes;
Appendix A, Section 4(f) Alternatives Summary Memorandum
Appendix B, LWCF EA FONSI
Appendix C, Least Overall Harm Analysis
Appendix D, Public Comment & Response Summary

This programmatic Section 4(f) form is to be used for certain federally assisted transportation improvement projects on existing or new alignments that will use property of a Section 4(f) park, recreation area, wildlife or waterfowl refuge, or historic property, which in the view of the DOT&PF and official(s) with jurisdiction over the Section 4(f) property, the use of the Section 4(f) property will result in a net benefit to the Section 4(f) property.

If any of your responses are contained within [brackets], do not continue filling out the form. Consult with the DOT&PF NEPA Program Manager for the appropriate action.

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

I. Project Description

The State of Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Highway Administration (FHWA), is proposing to improve Seward Highway from Milepost (MP) 105 to MP 107 (Windy Corner) which traverses the Turnagain Arm Unit of Chugach State Park (CSP) (Figure 1).

The proposed improvements include:

- reconstruction and widening of the existing two-lane highway to a divided highway with two 12-foot-wide through lanes, two 12-foot-wide auxiliary lanes, 8-foot-wide outside shoulders, 4-foot-wide inside shoulders and a 24-foot-wide depressed median (Figure 3);
- separation of northbound and southbound traffic by way of the depressed median (Figure 3);
- realignment of the highway and associated utilities to flatten curves to match a consistent 65 miles-per-hour (mph) design speed on Seward Highway (Figure 2);

- addition of auxiliary lanes and a dedicated left-turn lane (Figure 4);
- relocation of the Alaska Railroad Corporation's (ARRC) track and any utilities located within the ARRC track embankment offshore into Turnagain Arm (Figure 2);
- replacement of the existing parking areas (pullouts, widened shoulders) with new mountainside park facilities including a new expanded parking area and visitor amenities (Figure 4); and
- construction of a controlled-access parking area and boat ramp for emergency responder access for water rescues in Turnagain Arm (Figure 2).

Fill material to construct the project would be excavated from an area within CSP at MP 109, approximately 2 miles north of the project, (Figure 5). Should additional quantities and/or sufficient quality of material beyond that available at MP 109 become necessary for the project, the additional material would be excavated from an area at MP 104 (Figure 5). Any excavated material from these sites would only be used for the Windy Corner project.

Project Purpose

The purpose of the proposed Windy Corner project on the Seward Highway from MP 105 to MP 107, is:
1) to implement safety upgrades, and
2) to improve traffic operations

Project Need

The following conditions result in the need to implement safety upgrades and improve traffic operation:

Important Transportation Route
The Seward Highway is designated as an Alaska Scenic Byway, U.S. Department of Agriculture Forest Service Scenic Byway and FHWA All-American Road. It is the only road access connecting Anchorage to the Kenai Penninsula, communities to the south, and the Alaska Marine Highway System, which stops at Whittier, Seward and Homer. As such, the highway supports heavy commercial, recreational, and residential traffic. Annual average daily traffic volumes within the corridor were estimated at 7,756 vehicles for 2017 (Alaska DOT&PF Traffic Counts Annual Average Daily Traffic [AADT] GIS Map), with heaviest traffic volumes exceeding 22,000 vehicles per day during peak summer weekends.

High-Severity Crashes
Crash History
Safety upgrades are needed along the Seward Highway between MP 105 and 107 to address the elevated rate of high severity motor vehicle crashes in the project area. The Seward Highway is one of five designated safety corridors in Alaska. Since 2007, DOT&PF has embarked on efforts to provide physical safety improvements along segments of the corridor with historically high rates of high severity crashes (DOT&PF 2017d). The Seward Highway between MP 105 to MP 107 has been selected for a project and prioritized for improvements in part because it has the highest number of fatal crashes and the second highest number of major injury crashes over the past 40 years of any two-mile segment of the Seward Highway between Potter Station and Girdwood.

Roadway Conditions
The Seward Highway between MP 105 to MP 107 has a unique combination of roadway conditions that increase the likelihood of crashes. The likelihood of crashes increases where motorists travel at high speeds particularly when combined with the following conditions.
- sharp curves,
- limited sight distance,
- shoulder-parked vehicles,
- frequently slowing and stopping vehicles,
- frequently entering and exiting traffic with uncontrolled access,
- high speed differential between through traffic and stopping traffic, and

- the lack of a traffic separation barrier between north and southbound traffic

Between MP 105 and 107 all of the above conditions exist and most vehicles travel through the project area at 60-mph to 65-mph, exceeding the posted speed of 55-mph.

Traffic Congestion

The following traffic congestion problems result in the need to improve traffic operations:
Traffic Operation Improvements are needed along the Seward Highway between MP 105 and 107 to address the problem of traffic congestion in the project area. The following conditions in the project area contribute to traffic congestion.

- Vehicle Pullouts. Five pullouts within the project limits serve visitors recreating in the CSP. CSP users utilize these pullouts to access the trailheads and rock climbing areas, and to enjoying the views of sheep, bore tides, and/or beluga whales. Traffic flow on the Seward Highway in the project area is frequently disrupted by motorists slowing to enter or exit parking facilities or stopping along the highway shoulder to sight see and/or access recreation areas.
- Unique Dall Sheep Viewing. No other 2-mile segment of the Seward Highway has a similar sheep viewing area that draws substantial visitors yielding traffic congestion.
- Other Recreational Opportunities. Beyond sheep viewing, the Windy Corner area has a large variety of other recreational opportunities to attract visitors and generate traffic congestion including hiking, photography, rock and ice climbing, water sports, whale watching, bore-tide watching, and cycling
- Lack of Traffic Separation. The project area lacks auxiliary and deceleration lanes that would improve traffic flow by separating turning and through traffic. The project area also lacks adequate parking capacity and separation of parked vehicles from though traffic. Separation would improve traffic flow by lessening through-traffic slowing to navigate around stopped vehicles on highway shoulders.
- Sharp Curves. Traffic flow on the Seward Highway in the project area is disrupted by the sharp curves. Vehicles slow to navigate a series of four sharp reverse curves. The project area lacks flatter curves that would reduce curve-induced slowing and provide conditions for a more consistent traffic flow.

Design Speed Considerations

The project would flatten the sharp curves to meet a consistent 65-mph design speed. Constructing curves in the project area to a 65-mph design speed serves to meet both project purposes, improving safety and traffic operations. A 65-mph design speed addresses both the need to reduce high severity crashes and the need to decrease traffic congestion.

A 65-mph design speed upgrades safety and improves traffic operations as follows:

- flattening the roadway alignment to eliminate sharp reverse S-curves that are common locations of accidents for motorists and locations of traffic back-ups caused by vehicles slowing for lower speed curves;
- increasing the sight distance, providing a greater reaction time for motorists approaching the sheep viewing area where there is a greater potential of encountering hazards such as slowing, stopping, entering, existing, and parked vehicles;
- improving traffic flow to reduce driver frustration from following slower traffic in an area with few passing opportunities; and
- providing a design speed consistent with neighboring segments of the highway which either have or will have the goal of a 65-mph design speed

II. Section 4(f) Property Description

Describe the Section 4(f) property. Description should include size, location, type of property, ownership and identification of official with jurisdiction over the Section 4(f) property, and existing and/or documented planned activities, features and attributes of the property. If it is a historic property, provide the significance

criterion & aspects of historic integrity that qualify the property to be eligible for the National Register of Historic Properties. Include a map depicting the boundaries and major features of the Section 4(f) property in relation to the proposed project.

Property Type, Ownership, Official with Jurisdiction, Location, Management, Size

Chugach State Park (CSP) is a publicly-owned state park located in Southcentral Alaska mostly within the Municipality of Anchorage. CSP is owned by the State of Alaska and managed by the Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation (DNR-DPOR; DNR 2016), the official with jurisdiction over the park. The Seward Highway traverses CSP along the north shore of Turnagain Arm. The CSP lies adjacent to both sides of the Seward Highway and ARRC track. According to the 2016 CSP Management Plan, CSP contains approximately 495,000 acres of state-owned land (DNR-DPOR; DNR 2016).

Primary Purposes

In 1970 the Alaska legislature restricted the state-owned land and water described in Alaska Statutes (AS 41.21.120-41.21.125) to use as Chugach State Park in order to:
1) protect and supply a satisfactory water supply for the use of the people;
2) provide recreational opportunities for the people by providing areas for specified uses and constructing necessary facilities in those areas;
3) protect areas of unique and exceptional scenic value;
4) provide for the public display of local wildlife; and
5) protect the existing wilderness characteristics of the easterly interior area.

The eastern area of the park is operated as a wilderness area, the central area as a scenic area, and the periphery areas as recreational development zones (DNR 2016).

According to the 2016 CSP Management Plan the management intent of the Turnagain Arm Unit is to "*protect the scenic properties of the transportation corridor and encourage developments along and within the corridor which will provide for optimum enjoyment, access to the park, outdoor recreation opportunities and safety of all visitors along this route*." The Management Plan also states that DNR-DPOR will "*coordinate recreational development with highway upgrades when possible…preserve and interpret the historic, archaeological, and natural values of Turnagain Arm*…" (DNR 2016, page 110).

The 2016 CSP Management Plan includes the proposed improvements associated with Seward Highway MP 105- MP 107, and makes specific recommendations regarding the proposed project, as follows:

Proposal	Scope/Management Objective	Justification
Seward Highway Mile 107 Pullout-Mountainside	Depending on the highway upgrades and reclamation area at this site, the area could be suitable to relocate the current Windy Corner mountainside trailhead and trail from the sheep habitat area.	This area may be used as a materials site for highway upgrades to the Windy Corner area. If so, the reclamation area could serve to provide trailhead parking to the current trail.
Windy Corner Sheep Viewing Area	Upgrade existing pullout to create a safe sheep viewing area. Expand parking to a large lot with a buffer between the highway and parking area. Include interpretive displays and spotting scopes. Coordinate development with highway upgrades. Consult with ADF&G and Board of Game to establish management practices that may lead to enhanced wildlife viewing.	This area of the highway poses safety concerns as visitors try to view the sheep that congregate in the area. Parking is limited and there is significant traffic congestion when animals are present.

Reference: CSP 2016, Chapter 6, page 116

The 2010 CSP Chugach Access Plan (CAP) includes the proposed improvements and identifies safety hazards associated with activities in this area and recommendations for improvements as follows:

Name	Uses	Current Condition	Justification/Actions
Seward Highway Mile 107 Pullout	This site provides access for climbing and bouldering within the park.	This small pullout is located within the Seward Highway ROW *(right-of-way)* along Turnagain Arm.	Work with ADOT/PF to ensure climbing access continues when this portion of the Seward Highway is improved.
Windy Corner-Oceanside	This popular site provides opportunities for sightseeing and scenic viewing of the Turnagain Arm, the Chugach Mountains, and wildlife. The site provides one of the best sheep viewing opportunities in Alaska.	This pullout is within the Seward Highway and Alaska Railroad ROW. This site is a significant traffic hazard with sheep viewing and through traffic moving at significantly different speeds.	Work with ADOT/PF to enlarge and build a safer facility in this area for wildlife viewing when this portion of the Seward Highway is improved.
Windy Corner Trailhead	This site provides one of the best sheep viewing opportunities in Alaska. The site also provides access to the Turnagain Arm Trail, which runs from Potter to Windy Corner.	This trailhead located along the rocky headlands of Turnagain Arm contains a small pullout within the Seward Highway ROW and provides access to the Turnagain Arm Trail. This site is a significant traffic hazard with sheep viewing and through traffic moving at significantly different speeds.	Work with ADOT/PF to enlarge and build a safer facility in this area for wildlife viewing when this portion of the Seward Highway is improved.

Reference: CSP CAP 2010, Access Specific Recommendations pages 67 to 68

General Park Activities/Features/Attributes:

Development in CSP is limited. Most of the terrain is best suited to the recreationist prepared to enjoy a backcountry experience. The Turnagain Arm Unit has eight developed recreation access points located along the Seward Highway corridor consisting of trailheads, trails, scenic overlooks, and parking areas. Specifically these are Potter Section House State Historic Site, Potter Creek Trailhead, McHuch Creek Trailhead, Bird Ridge Trailhead, Bird Creek Access & Trailhead, Bird Creek Overflow Parking & Campground, Bird Creek Campground & Trailhead, and Bird Point Viewpoint. These are located along the Seward Highway corridor and consist of trailheads, trails, scenic overlooks, and parking areas.

The Seward Highway provides access for local residents and tourists to multiple recreational activities within the Turnagain Arm Unit. Major recreational activities occurring along the Seward Highway wildlife viewing, rock climbing, wildlife and scenery photography, access to Turnagain Arm shorelines and waters, easier hiking, cycling, sport fishing, and access to more advanced backcountry.

The entire project area lies within the CSP Turnagain Arm Unit with water to the south and mountainous terrain to the north. The ARRC track parallels the highway through this corridor. The highway is designated as an Alaska Scenic Byway, U.S. Department of Agriculture Forest Service Scenic Byway, and FHWA All-American Road. The waters of Turnagain Arm are home to the Cook Inlet population of beluga whales (*Delphinapterus leucas*) and a frequent bore tide, both of which can be viewed from numerous pullouts located directly above the water. Water activities (i.e.

windsurfing, kite surfing, and paddle boarding), have been gaining popularity in the past decade.

CSP Activities/Features/Attributes in Project Vicinity (Figure 6)

Undeveloped Lands

To obtain material to construct the proposed action the project proposes material extraction from up to 35.40 acres of CSP lands near MP 109 and 104 of the Seward Highway. Extraction at MP 109 would affect up to 19.60 acres and at MP 104, if needed, would affect up to 15.80 acres. There is no established recreational use within the areas proposed for material extraction. Informal and game trails may be present but there are no developed and maintained recreational trails or other amenities. The 2016 CSP Management Plan recommends future improvements at the MP 109 material source. .However, due to current fiscal constraints and lack of staffing oversight, development of this area for recreational use will not occur.

Turnagain Arm

The CSP in the vicinity of the project includes parts of the Turnagain Arm mudflats and rocky outcrops. The realigned Seward Highway would impact 26.30 acres of these intertidal mudflats within the CSP. Intertidal mudflats are un-vegetated bottoms of estuaries that lie between the high and low tide lines. At low tide, stream channels cut through the intertidal mudflats in the project area. Marine organisms adapted to stressful conditions survive in the mudflats and provide a valuable food source to creatures higher on the food chain making the mudflats valuable marine habitat. In addition to providing valuable marine habitat, the intertidal mudflats experience bore tide activity as well as being within the boundaries of designated critical habitat for the Cook Inlet Beluga whale. Both bore tide and Beluga whale viewing are tourist attractions. There are no developed facilities for recreational access to Turnagain Arm for water sport activities including windsurfing.

Dall Sheep

The south facing slopes and meadows above Windy Corner are good habitat for Dall sheep between late spring and fall (DNR 2016). This rugged area is suitable to raise and shelter lambs from predators and provides a high value mineral lick. Windy Corner provides grand vistas and one of the best Dall sheep viewing opportunities in Alaska (DNR 2016). Tourists often pull onto the highway shoulders to access the area for Dall sheep viewing and photo opportunities.

Parking Pullouts

Five pullouts within the project limits serve visitors recreating in the CSP. These pullouts include the 30-foot wide by 350-foot-long Windy Corner turnout, the 30-foot wide by 220-foot long Windy Corner Trailhead pullout, and three areas with widened shoulders (550', 230', and 300' long, respectively). CSP users utilize these pullouts to access the trailheads and rock climbing areas, and to enjoy the views of sheep, bore tides, and/or beluga whales.

Trail

The Turnagain Arm Trail runs along the Seward Highway from the Potter Creek access to the Windy Corner trailhead located within the project limits. This trail extends into the CSP and provides access to recreational activities including photography, hiking, and rock climbing (DNR 2016).

Rock Climbing

The Goat's Head Soup (GHS) rock climbing ridge is located northeast of the Seward Highway at approximately MP 106.8 and contains thirteen climbing routes (Figure 7). Twelve routes are within DOT&PF ROW. One route is within the CSP.

III. Applicability Requirements for Historic Properties

	YES	NO
1. For historic properties, does the project require the major alteration of the characteristics that qualify the property for the National Register of Historic Places (NRHP) such that the property would no longer retain sufficient integrity to be considered eligible for listing?	[☐]	☐

2. For archaeological properties, does the project require the disturbance or removal of the archaeological resources that have been determined important for preservation in-place rather than for the information that can be obtained through data recovery? [☐] ☐

   The determination of a major alteration or the importance to preserve in-place will be based on consultation consistent with 36 CFR part 800.

3. For historic properties, consistent with 36 CFR part 800, is there agreement among the SHPO and /or THPO, as appropriate, and the DOT&PF on measures to minimize harm when there is a use of Section 4(f) property? Such measures must be incorporated into the project. ☐ [☐]

   Describe SHPO/THPO consultation and findings.

Section III. Not Applicable. The 4(f) property covered by this document is not a historic property.

IV. Alternatives and Findings **N/A YES NO**

This section is used to demonstrate that there are no feasible and prudent alternatives to the use of the Section 4(f) property.

The programmatic evaluation does not apply if a feasible and prudent alternative is identified that is not discussed in this document.

1. Discuss the impacts of the Do Nothing Alternative.

   Demonstrate that the action would not address nor correct the transportation need cited as the NEPA purpose and need which necessitated the proposed project.

Do Nothing Alternative.

The Seward Highway is vital to the movement of people and goods in the State of Alaska and serves as a local and national tourism and recreation attraction. The Do Nothing Alternative is not feasible and prudent for the following reasons.

Prudent and Feasible Evaluation:

A. Identified Transportation Needs not Met. The Do Nothing Alternative does not meet the identified transportation purpose and need. The Do Nothing Alternative does not correct the existing roadway characteristics that contribute to high severity accidents and traffic congestion. There would continue to be stopped vehicles close to through traffic and high traffic speed diffentials compounded by the mix of commercial, residential, and recreational traffic. There would be minimal separation of through traffic, turning traffic, opposing traffic, parked vehicles, and pedestrians Sharp roadway curves would continue to cause drivers to slow to a speed where they are comfortable negotiating the highway. Following slower traffic can cause driver frustration leading to risky behavior such as unsafe passing manuevers. Sight distance around the curves would continue to be limited reducing the margin of error for drivers encountering unanticipated situations such as stopped or slowing traffic along a major highway. Under this alternative, traffic congestion and the potential for high severity crashes would continue or increase.

B. Substantial Adverse Community, Social, and Economic Impacts. The Do Nothing Alternative would result in substantial adverse community, social, and economic impacts. The Do Nothing Alternative would adversly impact the safety and reliability of commuter travel times, freight carriers, emergency vehicle access, as well as the optimum enjoyment and safety of all visitors and residents traveling through the corridor.

C. Substantial Missed Opportunity to Benefit a Section 4(f) Property.
The Do Nothing Alternative would miss a substantial opportunity to benefit the CSP, a Section 4(f) property. Unlike the preferred alternative, the Do Nothing Alternative would not be consistent with CSP plans that call for improvements for wildlife viewers and other recreational users in this area of the Turnagain Arm Unit.

D. Unique problems and adverse impacts of extraordinary magnitude. The Do Nothing Alternative would result in unique problems and adverse impacts of extraordinary magnitude. Failure to address the safety and traffic congestion on this major Alaskan highway would result in continued high-severity crashes and traffic delays in a traffic corridor that is the only road access between the Kenai Peninsula and Anchorage. Traffic delays due to a high severity accident on the Seward Highway can be significant, often taking up to 8 hours after a major incident to fully reopen all lanes. The lack of alternate roadway routes means traffic can back up for miles even with a relatively minor incident. This alternative would not provide additional lanes to divert traffic during any incident on the highway.

Finding: A Do Nothing Alternative that does not use the Section 4(f) property has been evaluated and is not considered feasible and prudent. ☒ [☐]

2. Describe an alternative that would improve the transportation facility in a manner that addresses the purpose and need without use of the Section 4(f) property.

Demonstrate that it is not feasible and prudent to avoid Section 4(f) property by using engineering design or transportation system management techniques, such as minor location shifts, changes in engineering design standards, use of retaining walls and/or other structures, and traffic diversions or other traffic management measures because they would result in:

a) Substantial adverse community impacts to adjacent homes, businesses, or other improved properties; or
b) Substantially increased transportation facility or structure cost; or
c) Unique engineering, traffic, maintenance, or safety problems; or
d) Substantial adverse social, economic, or environmental impacts; or
e) A substantial missed opportunity to benefit a Section 4(f) property; or
f) The improvement would not meet the identified transportation needs; and
g) The impacts, costs, or problems would be truly unusual or unique, or of extraordinary magnitude when compared with the proposed use of the Section 4(f) property after taking into account measures to minimize harm and mitigate for adverse uses, and enhance the functions and value of the Section 4(f) property.

Discussion:

Improvement Addressing Purpose & Need - Avoidance Alternative

There is no alternative that would meet the project purpose and need to improve safety and traffic operations at Windy Corner without using a Section 4(f) resource. The Seward Highway traverses through the Section 4(f) resource and any changes to roadway geometry that meet the purpose and need of the project would extend outside of the existing ROW.

In search for an alternative that would improve the transportation facility in a manner that addresses purpose and need without use of Section 4(f) property, DOT&PF analyzed maximizing the improvements that could be made while remaining within the existing ROW as discussed below.

Stay within Existing Highway Right-Of-Way (Alternative 1)

There is not a build alternative that improves the transportation facility in a manner that addresses purpose and need without use of a Section 4(f) property. In an effort to identify such an alternative, Alternative 1 was developed which constructs all improvements within the existing right-of-way. This would limit cuts and fills to within the existing ROW avoiding encroachment into neighboring Section 4(f) resources including CSP and the ARRC railroad tracks. This alternative shifts the highway centerline slightly to flatten curves and requires a retaining wall between the railroad and highway. This alternative provides a minimum 25-foot rock catchment area in locations along the corridor where the roadway shoulder is immediately adjacent to mountainside rock cliffs.

The typical section for this alternative consists of a two-lane, undivided highway with 12-foot-wide through lanes and 8-foot-wide shoulders similar to the existing roadway. Design speed would vary through the project given the limited ROW available to address roadway geometry.

Curve Number	Exiting Radius (feet)	Existing Design Speed (mph)	Alternative 1 Radius (feet)	Alternative 1 Design Speed (mph)
C1	2,865	65	3,010	65
C2	1,206	55	1,530	60
C3	1,432	60	1,680	60
C4	996	50	1,060	55
C5	996	50	1,990	60

Prudent and Feasible Evaluation:

- Community Impacts - Alternative 1 would not result in substantial adverse community impacts to adjacent homes, businesses, or other improved properties. However, after a major incident the community would be impacted until all lanes of traffic are reopened.
- Cost - Alternative 1 would not substantially increased roadway or structure cost. Alternative 1 has the lowest cost ($38,300,000) of all build alternatives considered.
- Social/Economic/Environmental Impacts - Alternative 1 would not result in any new substantial adverse social, economic, or environmental impacts. However, safety would still be an issue.

However, The Stay within Exisiting Highway ROW Alternative would not be feasible and prudent for the following reasons:

A. Identified Transportation Needs not Met.
- The Stay within Exisiting Highway ROW Alternative does not meet the identified transportation purpose and need. The Stay within Exisiting Highway ROW Alternative does not sufficiently correct the existing roadway characteristics that contribute to high severity accidents and traffic congestion.
  - roadway curves would remain sharper than recommended, resulting in reduced sight distance, limiting margin of error for drivers, and inconsistent travel speeds;
  - there would continue to be frequently stopped vehicles close to through traffic and high traffic speed differentials;
  - the design speed of 65-mph would not be met. It was applied to this alternative, but it cannot be met due to constraints in ROW, horizontal separation requirements from railroad tracks, curve and tangent lengths, and rock catchment width. Design speed would need to be limited to 55- or 60-mph. The posted speed would be limited to 55-mph;
  - there would be minimal or no separation of through traffic, turning traffic, opposing traffic, parked vehicles, and pedestrians. The lack of separation would continue to result in the potential high severity crashes, in particular head on collisions that are significantly mitigated by separation of opposing traffic.

- There would be no new auxiliary lanes to improve ingress/egress or to allow for relief of traffic congestion.
- Under this alternative, traffic congestion and the potential for high severity crashes would continue and could increase.

B. Social Impacts.
Alternative 1 has substantial potential for public and agency opposition due to reduced safety improvements in comparison with other alternative.

C. Unique Engineering, Traffic, Maintenance, and Safety Problems.
- Excavation further into the slopes at Windy Corner may lead to increased DOT&PF maintenance costs and safety issues. Some adjacent slopes are comprised of loose, friable material, and may have a higher rate of sliding towards the highway if disturbed. This would require more dangerous maintenance response operations and more safety hazards related to rockfall on the highway.
- This alternative does not address the unique traffic and safety hazards associated with motorists traveling at substantially different speeds with through traffic (residential and commercial) and stopping or slowing traffic (recreational).
- This portion of the highway contains a mix of recreational, residential, and commercial traffic squeezed between the Chugach Mountains and Turnagain Arm. It provides distracting natural and scenic views and has regular rockfall onto the highway. Each of these issues provides unique safety concerns on such a critical state highway and the proposed project improvements to public safety outweigh the loss of less than one percent of CSP available for recreational activities.

D. Substantial Missed Opportunity to Benefit a Section 4(f) Property.
- The Stay within Existing Right-of-Way Alternative would not include construction of park facilities on the mountainside of the highway. The proposed action's new park facilities include substantial amenities benefiting CSP (Figure 4). These benefits include:
  - expanded parking capacity to include 33 total parking spaces, consisting of 24 standard parking spaces, 2 handicap accessible spaces, and 7 recreational vehicles (RVs) or large vehicle spaces;
  - a gravel pad to accommodate overflow parking, which can be closed or opened seasonally;
  - a sheep viewing area with viewing platforms maintaining appropriate distance between wildlife and observers;
  - toilet facilities;
  - wildlife educational/ interpretive panels;
  - spotting scopes;
  - pathways;
  - benches;
  - improved trail head access including a foot path connection to the existing Turnagain Arm Trail; and
  - signage to direct visitors to various amentities.
- The construction of park facilities on the mountainside of the highway was included in the proposed action to offset impacts to the park for project-specific material extraction within the park. Overall, the benefits of the new park facilities on the mountainside of the highway would outweigh the material extraction impacts resulting in a net benefit to the park. The Section 4(f) Stay within Existing Right-of-Way Alternative would not extract material from within the park and therefore not include the benefits of the new park facilities or provide space for new facilities on the mountainside of the highway. This would result in a substantial missed opportunity to benefit CSP.
- Alternative 1, does not provide an emergency access ramp for water rescue operations in the Turnagain Arm resulting in a missed opportunity to provide this benefit to CSP visitors participating in water activities.

Finding: A highway improvement that does not use the Section 4(f) property has been evaluated and is not considered feasible and prudent. ☒ [☐]

3. Identify a Build Alternative on new location that does not use the Section 4(f) property and fully discuss the resulting impacts.

Demonstrate that the new location:

a) Would not address or correct the problems cited as the NEPA purpose and need, which necessitated the proposed project; or

b) Would result in substantial adverse social, economic, or environmental impacts (including such impacts as extensive severing of productive farmlands, displacement of a substantial number of families or businesses, serious disruption of community cohesion, jeopardize the continued existence of any endangered or threatened species or resulting in the destruction or adverse modification of their designated critical habitat, substantial damage to wetlands or other sensitive natural areas, or greater impacts to other Section 4(f) properties; or

c) Would substantially increase costs or cause substantial engineering difficulties (such as an inability to achieve minimum design standards, or to meet the requirements of various permitting agencies such as those involved with navigation, pollution, or the environment); and

d) Would result in such problems, impacts, costs, or difficulties that would be truly unusual or unique, or of extraordinary magnitude when compared with the proposed use of Section 4(f) property after taking into account proposed measures to minimize harm, mitigation for adverse use, and the enhancement of the Section 4(f) property's functions and value.

Discussion:

New Location Section 4(f) Avoidance Alternative

There is not a build alternative on a new location outside the existing ROW, that would avoid the use of a Section 4(f) resource. Throughout the project length, Section 4(f) properties surround the Seward Highway ROW. The Seward Highway traverses CSP and runs adjacent to the ARRC railroad ROW, both Section 4(f) properties. Any shift in the Seward Highway ROW to one side or the other to place the highway in a new location would result in an encroachment on and use of a Section 4(f) resource.

Several alternatives, with varying degrees of impact to Section 4(f) resources, were developed and analyzed by DOT&PF. The results are summarized in a Section 4(f) Alternatives Summary Memorandum presented in Appendix A. The following alternatives are included.

- Alternative 1: Stay Within Existing Right-of-Way
- Alternative 2A: Shift Into Turnagain Arm, Material Location – Inside Chugach State Park
- Alternative 2B: Shift Into Turnagain Arm, Material Location – Outside Seward Highway Corridor
- Alternative 2C: Shift Into Turnagain Arm, Material Location – Inside Seward Highway Corridor
- Alternative 3: Shift Inland at Windy Corner
- Alternative 4: Tunneling

Alternative 1 (Stay Within Existing Right-of-Way Alternative) is discussed in the section above. It does not involve a new location outside the existing ROW but does incorporate minor alterations of the roadway centerline. Alternative 1 has been determined not feasible and prudent.

Alternatives 2A, 2B, 2C, 3, and 4 all involved a new location outside the existing highway ROW but could not avoid use of a Section 4(f) resource because CSP and ARRC ROW surround the highway ROW throughout the project length. Alternative 2A is preliminarily selected as the non-avoidance alternative with the least overall harm.

Finding: Build Alternatives on new location not using Section 4(f) property have been evaluated and are not considered feasible and prudent. ☒ [☐]

Note: The Federal Register, Vol. 70, No.75, April 20,2005, Page 20629 specifically requires, in a Net Benefit analysis, that an alternative be considered that involves building a new facility at a new location without a use of a Section 4(f) property. As noted above, there is not a build alternative on a new location outside the existing ROW, that would avoid the use of a Section 4(f) resource. Throughout the project length, Section 4(f) properties surround the Seward Highway ROW. The alternatives examined above (Alternatives 2A, 2B, 2C, 3, and 4) all involved a build alternative on new location outside the existing highway ROW but could not avoid use of a Section 4(f) resource. Of the build alternatives on new location that still involved use of Section 4(f) property, Alternative 2A was found to result in the least overall harm. Discussions of factors considered in determining the non-avoidance alternative with the least overall harm can be found in the Section 4(f) Alternatives Summary Memo attached to this document. A Least Overall Harm Analysis is located in Appendix C.

V. Minimization of Harm

	YES	NO
1. Does the proposed action include all possible planning to minimize harm, include appropriate mitigation measures, and has the official with jurisdiction agreed in writing to these measures?	☒	[☐]

2. Discuss minimization and mitigation measures:

Minimize the Project Footprint on Section 4(f) Resource.

The proposed alignment minimizes the fill footprint and optimizes the available rock-cut areas within the existing Seward Highway ROW. The proposed alignment was selected so the highway and railroad remain within the existing ROW to the extent possible while still meeting the design criteria selected to provide safety improvements; this limits the extent of impacts to the Section 4(f) lands by decreasing the encroachment in the Turnagain Arm mudflats and rocky outcrops and reducing the quantity of material required from CSP. Retaining walls are propoposed where possible; similar to the alignment design, the retaining walls will decrease the encroachment in the Turnagain Arm mudflats and reduce the quantity of material required from CSP.

Maintenance activities along the Seward Highway occassionally require blasting of rockfall areas to reduce safety hazards. These maintenance activities are typically scheduled in response to specific events and not planned far in advance. However, if materials become available from maintenance and operations activities in a nearby area close to or during the time of construction, DOT&PF would work to identify temporary storage locations and use material that meets quality criteria for the project to reduce quantities needed from material excavation in CSP.

Section 4(f) Mitigation (Replacement Lands and Construction of Park Facilities)

The proposed project will mitigate Section 4(f) use of 26.30 acres of CSP lands for roadway realignment by relinquishing 14.70 acres of lands currently used for transporation form DOT&PF to DNR for CSP use.

The proposed project will mitigate Section 4(f) use of 35.40 acres of CSP lands due to material extraction at MP 109 and, if required at MP 104, by providing recreation facilities for CSP. The proposed project would construct new park facilities on the mountainside of the highway, including a parking area with a sheep viewing area, toilet facilities, wildlife educational panels, spotting scopes, pathways, benches, improved trail head access, and improved signage. (Figure 4). These facilities would replace the existing pullouts in the vicinity of Windy Corner. The proposed facilities at the Windy Corner Trailhead and Windy Corner sheep viewing area will be transferred to CSP.

At the Windy Corner Trailhead and Windy Corner sheep viewing area the expanded paved parking area will include 33 total parking spaces, including 24 standard parking spaces, 2 handicap accessible spaces, and 7 recreational vehicle or large vehicle spaces. A gravel pad will be constructed to accommodate overflow parking, which can be

closed or opened seasonally (Figure 4).

Incorporation of Landscaping

Recreation facility improvements have been incorporated into the design as described above. The intermittent drainage running through the core of the proposed improvements would be incorporated into the design and landscaping. The pedestrian facilities would include pedestrian walkways along and/or over the drainage. The drainage channel would be realigned adjacent to the gravel parking area. Areas of disturbed soils will be landscaped and re-seeded with an approved seed mix following disturbance.

The proposed material extraction at MP 109 would be designed to include a vegetated topographic screen, consisting of a buffer of intact earth between the proposed material extraction location and much of the adjacent Seward Highway. This screen would be approximately 100 feet wide, and would limit visual impacts for northbound traffic to approximately 0.25 miles (for approximately 15 seconds) and for southbound traffic to approximately 0.50 miles (for approximatley 30 seconds).

Section 6(f) Mitigation (Replacement Lands)

The project as proposed would require the conversion of approximately 4.16 acres of rocky outcrops for roadway realignment and up to 35.40 acres of undevelop uplands for material extraction for a total conversion of 39.56 acres of Land and Water Conservation Fund (LWCF)-protected lands to transportation use. The lands used for material extraction will remain part of the CSP.

To compensate for this loss, DOT&PF proposes to transfer approximately 14.70 acres of uplands within the existing Seward Highway ROW to CSP (Figure 5). This land would no longer be required for transportation purposes due to shifts in the centerline of the existing highway and would be used instead for recreational use.

An Environmental Assessment (EA) of conversion of lands protected under Section 6(f)(3) of the LWCF Act, was prepared for the use of Section 6(f) lands. The National Park Service (NPS) issued a Finding of No Significant Impact (FONSI) for the conversion on 5/30/2019, see Appendix B. As described in those documents, DOT&PF is providing payment of fair market value for the conversion of 39.56 acres of Section 6(f)-protected lands by relinquishing 14.70 acres of land within the existing highway ROW.

Based on a valuation provided by MacSwain Associates, LLC (August 2018) the estimated fair market value for the land obtained from CSP is $193,700 and the fair market value for the land relinquished to CSP is $231,300. Appraisal documents can be found in Appendix C of the Section 6(f) EA located on the documents page of the project website: www.windycorner.info. The land relinquished to CSP including the new recreational facilities is valued at $2.5 million, 92% greater than the fair market value of the land and minimal improvments taken.

Least Overall Harm Analysis

A Least Overall Harm Analysis is located in Appendix C. The analysis covers five of the seven alternatives that do not completely avoid the Section 4(f) property (CSP). The conclusion of this analysis is that, after inclusion of mitigation measures, Alternative 2A (Proposed Action) results in the least overall harm to Section 4(f) resources.

VI. Coordination and Public Involvement

	N/A	YES	NO
1. Has the proposed project been coordinated with the federal, state, and/or local officials having jurisdiction over the Section 4(f) property?		☒	[☐]

2. Summarize coordination.

Federal, state, and local agency officials having jurisdiction over the Section 4(f) lands were solicited for comment and information. Coordination for the MP 105-107 segment of the proposed improvements has been on-going throughout the design and environmental review process, including consultation under Section 6(f) of the LWCF. Regularly scheduled meetings were held with DNR-DPOR to coordinate project design and minimize impacts on park use and facilities. An agency Technical Advisory Group (TAG) was established and regularly scheduled TAG

meetings were held to develop the proposed project and review the design. Meetings held to update agencies on this project are listed in the table below.

Date	Type of Meeting
February 18, 2013	Girdwood Board of Supervisors
March 6, 2013	Alaska Department of Natural Resources
March 12, 2013	Alaska Department of Natural Resources
March 20, 2013	Agency Scoping Meeting
April 15, 2013	Girdwood Board of Supervisors
May 28, 2013	Technical Advisory Group TAG Meeting #1
July 24, 2013	ARRC Coordination Meeting
August 8, 2013	Technical Advisory Group Meeting #2
August 27, 2013	Alaska Department of Natural Resources and Alaska Department of Fish & Game
November 1, 2013	Technical Advisory Group Meeting #3
December 16, 2013	ARRC Coordination Meeting
April 9, 2014	Technical Advisory Group Meeting #4
May 21, 2014	Girdwood Board of Supervisors
October 13, 2014	Municipality of Anchorage, Planning & Zoning Commission
March 18, 2015	Alaska Department of Natural Resources Coordination Meeting
June 4, 2015	Technical Advisory Group Meeting #5
October 15, 2015	Alaska Department of Natural Resources Coordination Meeting
August 1, 2016	Municipality of Anchorage
December 14, 2016	Municipality of Anchorage, Urban Design Commission
June 1, 2017	Alaska Department of Natural Resources Coordination Meeting

The NPS prepared an EA for the proposed conversion of 6(f) property with this project and on May 30, 2019 approved a FONSI. The NPS EA and FONSI are located on the documents page of the project website, www.windycorner.info.

The DNR is published a Commissioner's Finding and has made a preliminary determination that there are no prudent or feasible alternatives to avoid the CSP and that the Windy Corner Project would have no significant adverse effect to CSP. DNR has also preliminininary concurred with the following items from the Section 4(f) evaluation: the assessment of impact to CSP, the proposed measures to minimize harm to CSP, proposed mitigation necessary to preserve, rehabilitiate, and enhance those features and values of CSP, and that such measures will result in a net benefit to CSP (See item 4 below).

3. In the case of non-federal Section 4(f) property, the official with jurisdiction has been asked to identify any federal encumbrances [e.g. lands from a site purchased or improved with funds under the *Land and Water Conservation Fund Act (LWCF)*, the *Federal Aid in Fish Restoration Act* (Dingell-Johnson Act), the *Federal Aid in Wildlife Act* (Pittman-Robertson Act) or similar laws or lands are otherwise encumbered with a Federal interest]. ☐ ☒ [☐]

   If applicable, discuss any encumbrances and include a copy of the correspondence (e.g. letter, e-mail, phone log) from the official with jurisdiction of the Section 4(f) property and any appropriate officials regarding federal encumbrances (e.g. Alaska Department of Natural Resources Grants Administrator for the LWCF).

The CSP received funds under LWCF. The NPS prepared an EA for the proposed conversion of 6(f) property for this project and on May 30, 2019 approved a FONSI. The NPS EA and FONSI are located on the documents page of the project website, www.windycorner.info. DNR, as Grants Administrator, coordintated the NPS approvals.

4. As the official with jurisdiction over the Section 4(f) property I have reviewed and concur with the assessment of impacts; the proposed measures to minimize harm; and the mitigation necessary to preserve, rehabilitate and enhance those features and values of the Section 4(f) property; and that such measures will result in a net benefit to the Section 4(f) property. ☐ [☐]

[Printed Name and Signature] Official with Jurisdiction over the Section 4(f) Resource Date

Title and Agency/Division:

Corri A. Feige, Alaska Department of Natural Resources Commissioner

5. The project includes public involvement activities that are consistent with the specific requirements of 23 CFR 771.111, early coordination, public involvement and project development. For a project where one or more public meetings or hearings are held, information on the proposed use of the Section 4(f) property shall be communicated at the public meeting(s) or hearing(s). ☒ [☐]

Summarize public involvement.

Starting in 2013, DOT&PF conducted-public involvement activities with interested stakeholders to inform them of the project and to solicit comments. Information was provided on the project scope and potential environmental impacts, including use of the CSP lands for material extraction.

Public outreach has included holding public meetings, attending transportation fairs, participating in community planning meetings, sending project updates through mailers, and hosting a dedicated project website. DOT&PF continues to engage the public by way of the dedicated website and an additional public meeting planned in 2020 as part of the Environmental Assessment process.

Public meetings and open houses were held in March 2013, April 2014, and April 2016. Appendix D of this 4(f) document includes a table summarizing comments received and DOT&PF responses to those comments.

The table listing all project-related public involvment meetings is below,

Public comments received from these meetings resulted in the following design changes:

- Comments influenced the design of parking areas, access locations, and auxiliary lanes.
- Comments concerning the highway and railroad extending too far into Turnagain Arm, resulted in design shifting the highway and railroad inland through Gorilla Rock.
- Comments concerning the new material location and visibility from the highway, design included a natural buffer to minimize visual impacts at MP 109.
- Comments concerning a lack of emergency access to Turnagain Arm, resulted in the addition of a boat ramp and at-grade access.
- Comments requesting less use of CSP, resulted in commitment to not use material location at MP 104 for extraction unless MP 109 does not have sufficient quantity or quality of materials for this project.

Date	Type of Meeting
March 4, 2013	Public Meeting #1, Girdwood
May 9, 2013	Turnagain Arm Community Council
November 2, 2013	Girdwood 2020
December 19, 2013	Girdwood Rotary
April 24, 2014	Public Meeting #2, Girdwood
May 8, 2014	Turnagain Arm Community Council
December 18, 2014	Turnagain Arm Community Council
February 4, 2015	Anchorage Transportation Fair
February 4, 2016	Anchorage Transportation Fair
April 5 to May 13, 2016	Online Open House
April 19, 2016	Public Meeting #3, Anchorage Open House
April 20, 2016	Public Meeting #4, Girdwood Open House
September 22, 2016	Mat-Su Transportation Fair
February 15, 2017	Anchorage Transportation Fair
February 8, 2018	Anchorage Transportation Fair
September 13, 2018	Mat-Su Transportation Fair
October 13, 2018	Homer Transportation Fair
February 6, 2019	Anchorage Transportation Fair
September 12, 2019	Mat-Su Transportation Fair

VII. Determination and Approval

All applicable coordination and consultations have occurred during the development of this Section 4(f) Evaluation, and DOT&PF has determined that the project complies with April 19, 2005, "Section 4(f) Evaluation and Approval for Transportation Projects That Have a Net Benefit to a Section 4(f) Property" (2005 Programmatic) and that:

1. This project meets the applicability criteria prescribed.
2. All of the alternatives set forth have been fully evaluated.
3. The findings in this document (which conclude that the alternative recommended is the only feasible and prudent alternative) result in a clear net benefit to the Section 4(f) property.
4. The project complies with the Mitigation and Measures to Minimize Harm section of the 2005 Programmatic, and
5. The coordination and public involvement efforts required by the 2005 Programmatic have been successfully completed and necessary written agreements have been obtained.

Recommended Approval by: _____ _____

[Printed Name and Signature] Regional Environmental Manager — Date

Based on the above considerations, there is no feasible and prudent alternative to the use of land from the Chugach State Park and the proposed action includes all possible planning to minimize harm to the Chugach State Park resulting from such use.

Approved by: _____ _____

[Printed Name and Signature] NEPA Program Manager — Date

Distribute copies of the approved Programmatic 4(f) Evaluation to the federal, state, and/or local officials having jurisdiction over the Section 4(f) property.

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WINDY CORNER SECTION 4(F) – NET BENEFIT

FIGURES

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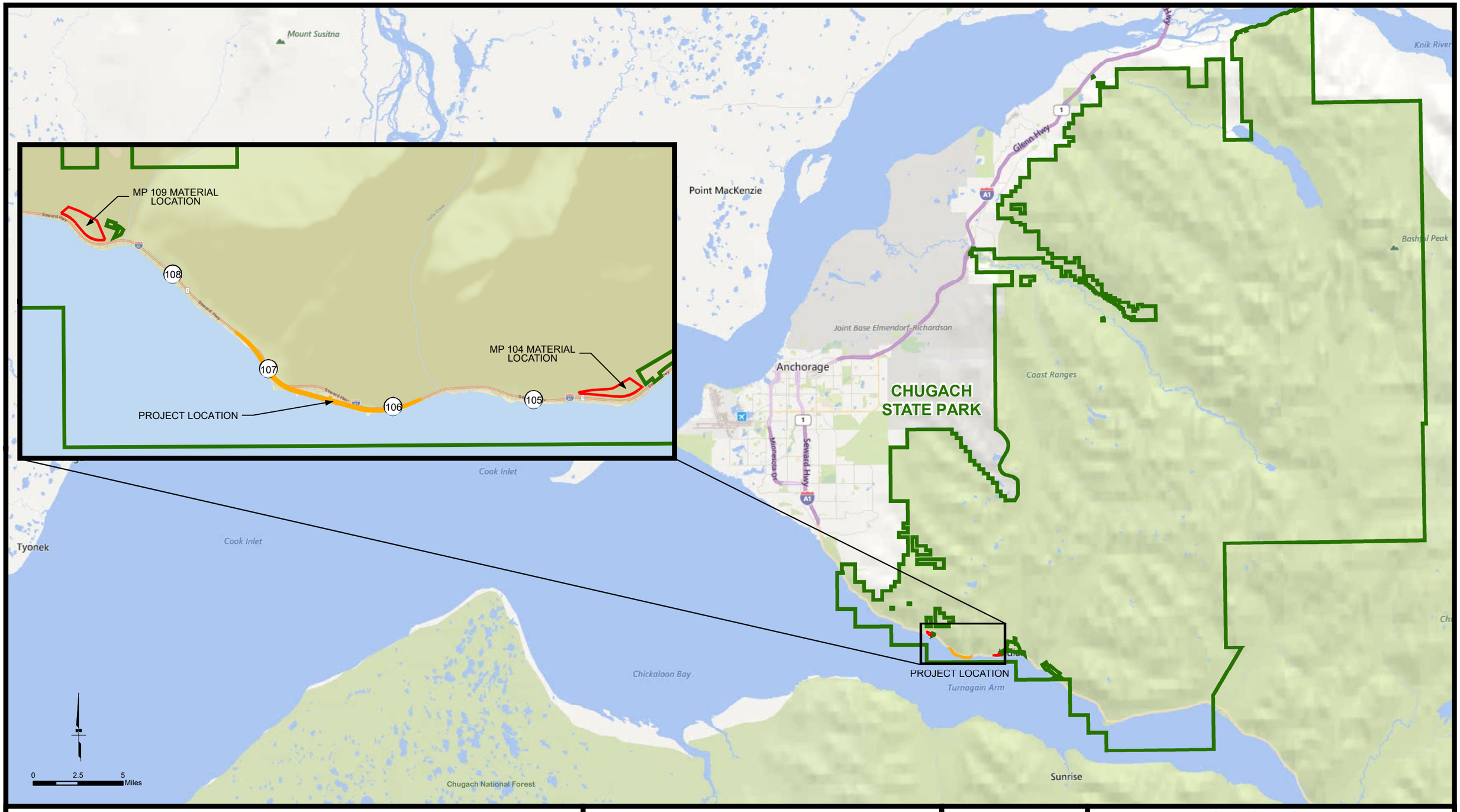


(#) MILEPOST

WINDY CORNER PROJECT AREA

MATERIAL LOCATION

CHUGACH STATE PARK BOUNDARY

WINDY CORNER 105 - 107
PROJECT LOCATION & VICINITY MAP

T10N R1W SEC 6
T10N R2W SEC 1-3
T11N R2W SEC 32-33
SEWARD MERIDIAN, ALASKA

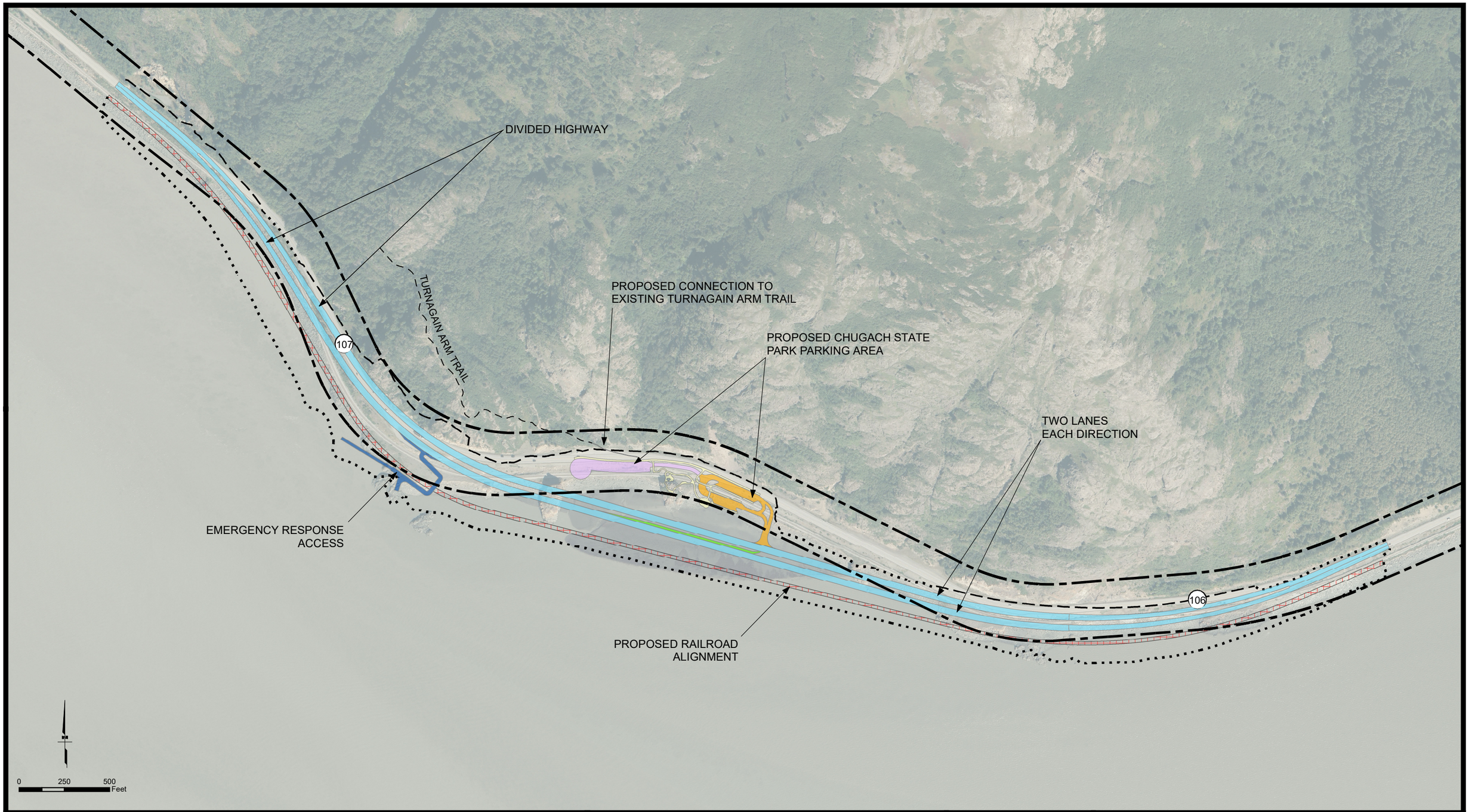
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF PROJECT NO. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

FEBRUARY 27, 2020 | FIGURE 1

Q:\24\61278\05_GIS\ENV\Section 4(f)\Location Vicinity Map.mxd Feb 27, 2020



- MILEPOST
- EXISTING RIGHT-OF-WAY
- PROPOSED CUT LIMITS
- PROPOSED FILL LIMITS
- PROPOSED LEFT-TURN LANE
- PROPOSED AUXILIARY & THROUGH LANE
- PROPOSED PARKING AREA
- PROPOSED GRAVEL PARKING AREA
- PROPOSED PATHWAYS
- PROPOSED RAILROAD ALIGNMENT
- EMERGENCY RESPONSE ACCESS

WINDY CORNER 105 - 107
PROPOSED ACTION PLAN VIEW

T10N R2W SEC 2 - 3
SEWARD MERIDIAN, ALASKA

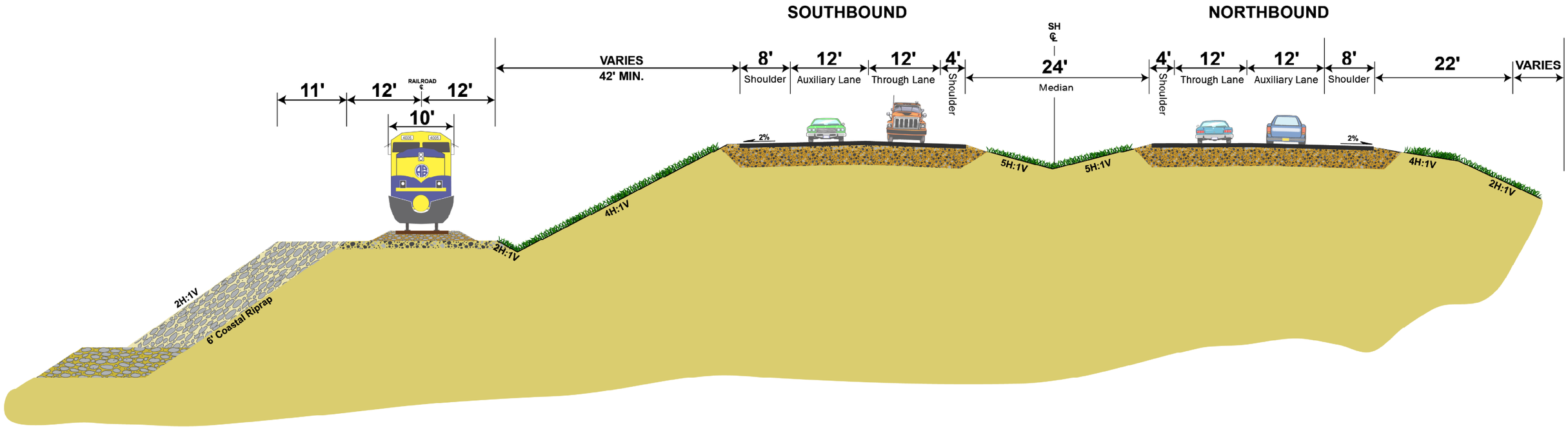
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF PROJECT NO. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

FEBRUARY 27, 2020 | FIGURE 2

Q:\24\61278\05_GIS\ENV\Section 4(f)\Proposed Plan View.mxd Feb 27, 2020 9:29:54 AM User: tjameson



WINDY CORNER 105 - 107
PROPOSED TYPICAL CROSS-SECTION

T10N R2W SEC 2 - 3
SEWARD MERIDIAN, ALASKA

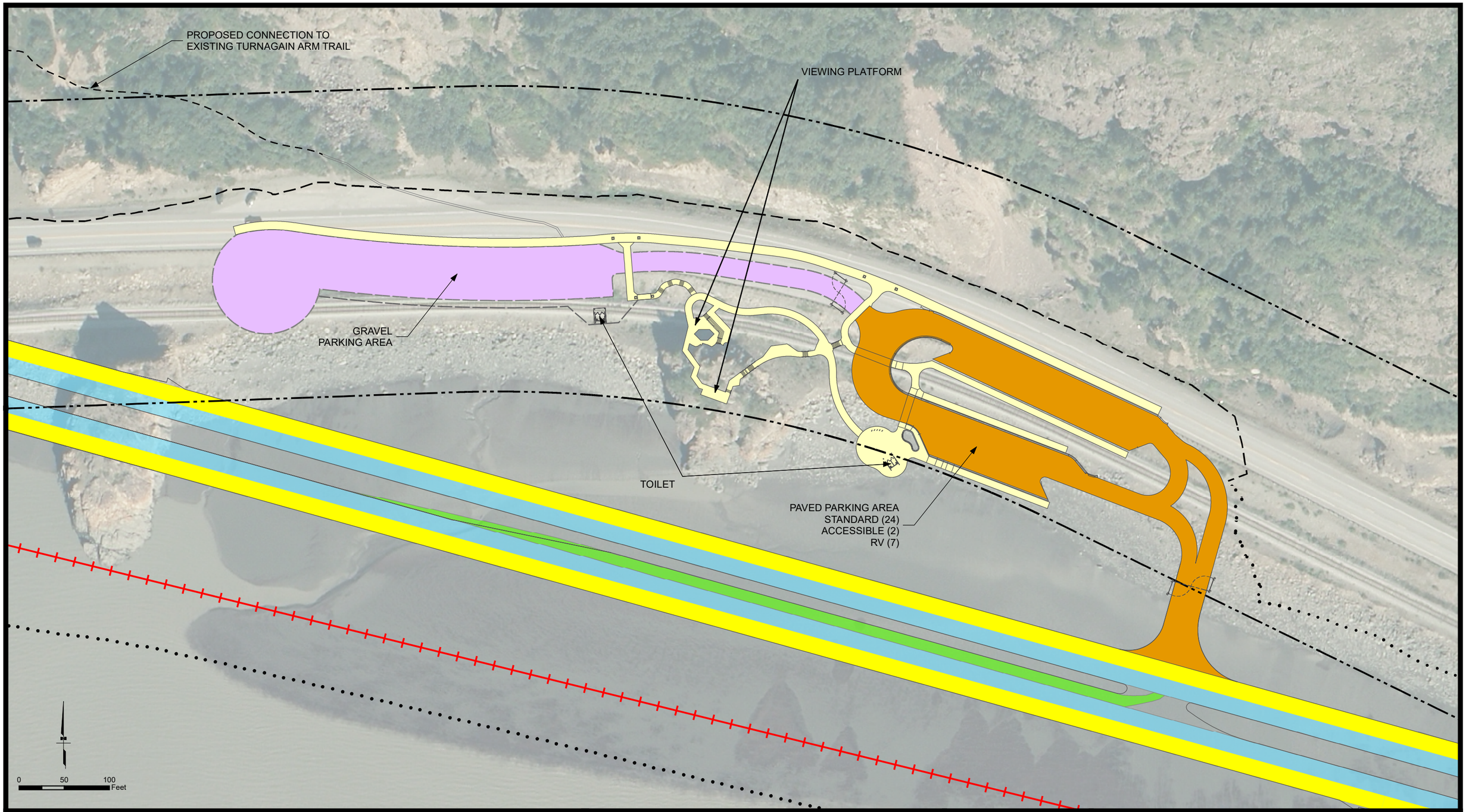
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF PROJECT NO. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

FEBRUARY 27, 2020 | FIGURE 3

Q:\24\61278\05_GIS\ENV\Section 4(f)\Cross Section.mxd Feb 27, 2020 9:30:46 AM User: tjameson



- EXISTING RIGHT-OF-WAY
- PROPOSED CUT LIMITS
- PROPOSED FILL LIMITS
- PROPOSED LEFT-TURN LANE
- PROPOSED THROUGH LANE
- PROPOSED AUXILIARY LANE
- PROPOSED GRAVEL AREA
- PROPOSED PARKING AREA
- PROPOSED PATHS (ADA ACCESSIBLE)
- PROPOSED RAILROAD ALIGNMENT

WINDY CORNER 105 - 107
MOUNTAINSIDE PARK FACILITY IMPROVEMENTS

T10N R2W SEC 2 - 3
SEWARD MERIDIAN, ALASKA

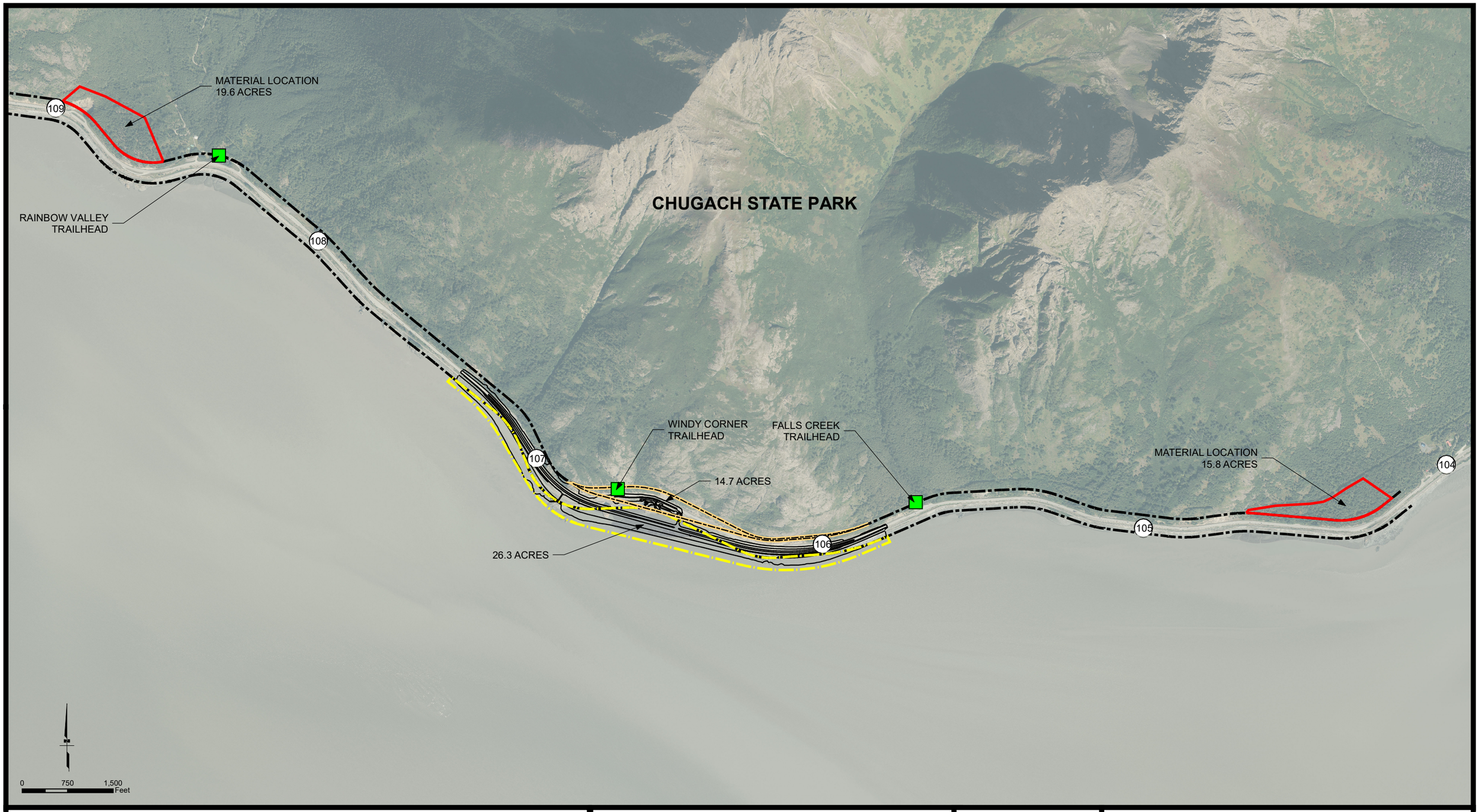
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF PROJECT NO. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

FEBRUARY 27, 2020 | FIGURE 4

Q:\24\61278\05_GIS\ENV\Section 4(f)\Mountainside Park Facility Improvements.mxd Feb 27, 2020 9:37:13 AM User: tjameson



- MILEPOST
- TRAILHEAD
- EXISTING RIGHT-OF-WAY
- PROPOSED ROADWAY IMPROVEMENTS
- MATERIAL LOCATION
- RIGHT-OF-WAY RELINQUISHMENT
- PROPOSED RIGHT-OF-WAY ACQUISITION

WINDY CORNER 105 - 107
RIGHT-OF-WAY OR EASEMENT
ACQUISITION AND RELINQUISHMENT

T10N R1W SEC 6
T10N R2W SEC 1-3
T11N R2W SEC 32-33
SEWARD MERIDIAN, ALASKA

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF PROJECT NO. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

FEBRUARY 27, 2020 | FIGURE 5

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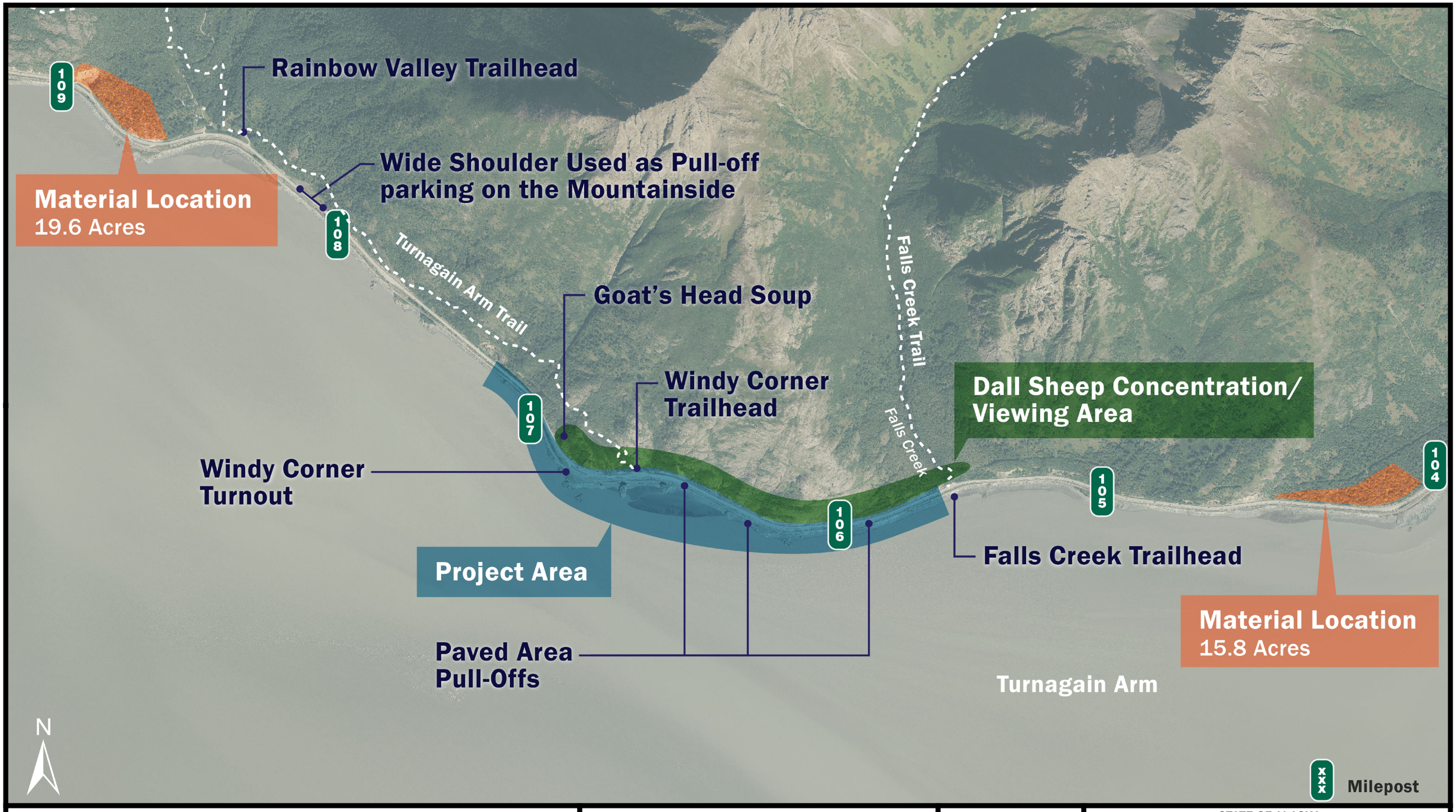


WINDY CORNER 105 - 107
EXISTING FACILITIES AND FEATURES BETWEEN MP 104-109 OF THE SEWARD HIGHWAY

T10N R1W SEC 6
T10N R2W SEC 1-3
T11N R2W SEC 32-33
SEWARD MERIDIAN, ALASKA

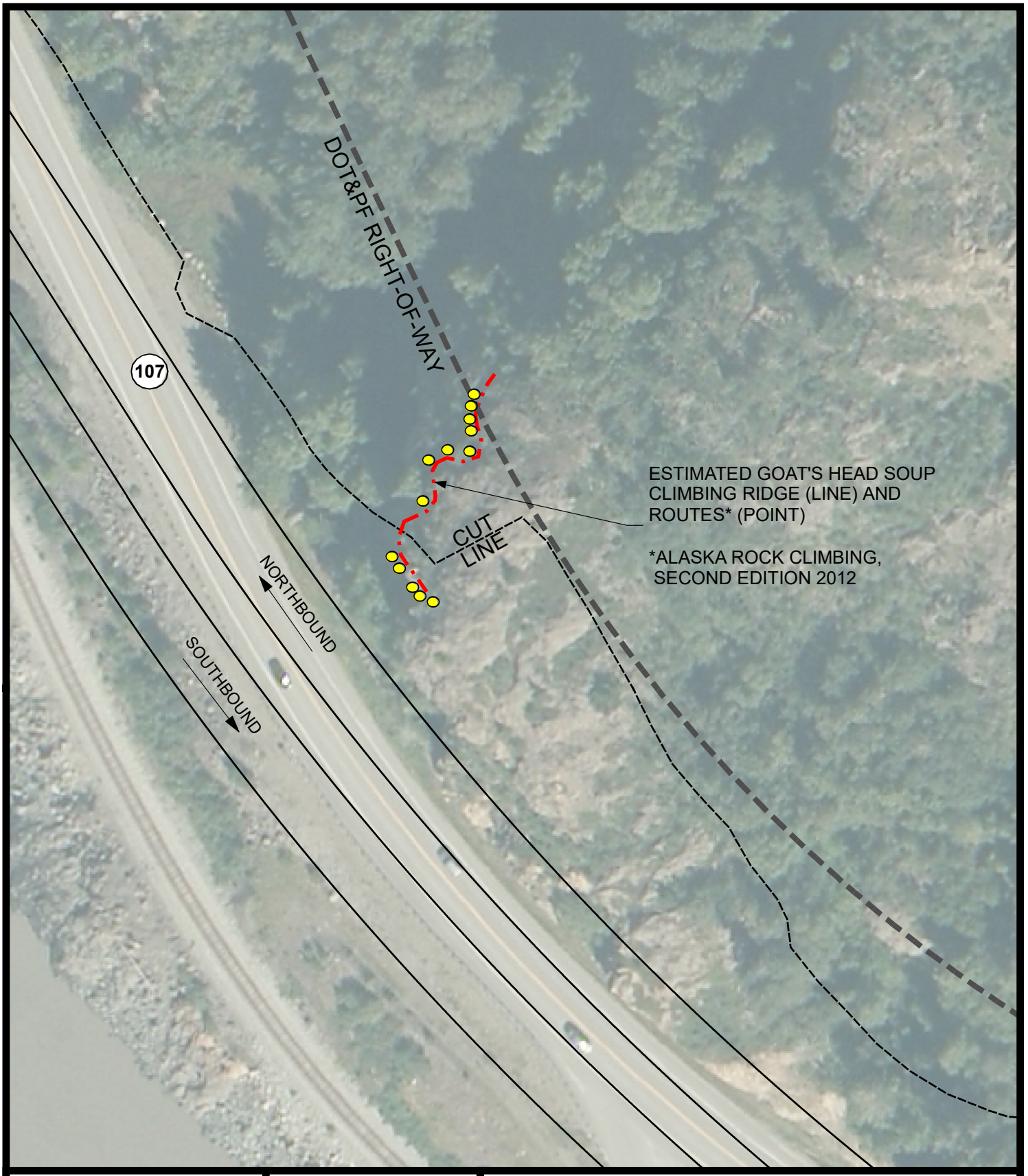
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

DOT&PF PROJECT NO. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

FEBRUARY 27, 2020 | FIGURE 6

Q:\24\61278\05_GIS\ENV\Section 4(f)\Existing Facilities and Features MP 104-109.mxd Feb 27, 2020 9:41:32 AM User: tjameson



WINDY CORNER 105-107
GOAT'S HEAD SOUP
CLIMBING ROUTES

T10N R2W SEC 3
SEWARD MERIDIAN, ALASKA

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF PROJECT NO. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

FEBRUARY 27, 2020 | FIGURE 7

Q:\24\61278\05_GIS\ENV\Section 4(f)\Goats Head.mxd Feb 27, 2020 9:42:05 AM

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WINDY CORNER SECTION 4(F) – NET BENEFIT

APPENDIX A

SECTION 4(f) ALTERNATIVES SUMMARY MEMORANDUM

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MEMORANDUM

TO:	Tom Schmid, P.E., DOT&PF
THROUGH:	Steve Noble, P.E., DOWL
FROM:	Aaron Christie, P.E. and Irene Malto, P.E., DOWL
DATE:	February 26, 2020
PROJECT:	Seward Highway: MP 105-107 Windy Corner Section 4(f) Alternatives Summary

INTRODUCTION

The Seward Highway is designated as a National/State Scenic Byway and an All-American Road and provides the sole overland access to communities south of Anchorage, the Kenai Peninsula, and the Alaska Marine Highway System. The highway supports heavy commercial, recreational, and residential traffic. The highway segment from Anchorage to Girdwood is one of five designated safety corridors in Alaska, due to the elevated rate of high-severity (e.g., fatal and major injury) crashes. As a popular area for viewing sheep along the highway, traffic operations between Milepost (MP) 105 and MP 107 are frequently disrupted by motorists slowing and parking/stopping along the highway shoulder to view sheep and other wildlife. This creates a high differential in speeds between motorists traveling through the corridor and those that are sightseeing. This differential in speeds combined with limited sight distance due to the roadway alignment following the curvature of the steep mountain cliffs and uncontrolled movement of traffic entering and exiting the highway result in an elevated rate of severe crashes in the corridor.

The Seward Highway extends approximately 127 miles from Seward, Alaska to Anchorage, Alaska. As stated in the project Design Study Report, the corridor meets the definition of a rural principal arterial which are designed to accommodate statewide travel at reasonable speeds with travel times expected by most motorist between populated and urban areas. As such, a design speed of 65 mile-per-hour (mph) is appropriate for the Seward Highway. The design speed is representative of the speed users will travel under optimal conditions, unimpeded by weather or other vehicles. Design speed is one of several factors used in determining the posted speed of a roadway segment. Posted speeds between Anchorage and Girdwood vary between 55 and 65-mph.

Using a consistent 65-mile-per-hour (mph) design speed instead of having a curves limited to design speeds varying from 50- to 65-mph within the project limits will improve safety. The road geometry associated with a higher design speed results in improved sight distance and flatter curves which will provide a greater margin of error for drivers. Drivers will not have to change speeds to comfortably negotiate the curves within the two mile project area resulting in smoother traffic flows. Realigning and dividing the Seward Highway at Windy Corner provides a long-term safety solution by providing auxiliary lanes for turning and passing movements, preventing head-on collisions by installing a median, and separating scenic viewpoints and recreation access points from the highway.

Section 4(f) of the United States Department of Transportation Act (1966) prohibits Federal transportation agencies, including the Federal Highway Administration (FHWA), from using land that encompasses part or all of a public parkland, recreation area, wildlife refuge, or public or private historic property for transportation purposes unless there is no feasible and prudent alternative; and furthermore, that the proposed action includes planning to minimize harm to the protected property resulting from the use (23 U.S.C. § 138 and 49 U.S.C. § 303).

This memorandum documents compliance with Section 4(f) of the aforementioned act by demonstrating that the State of Alaska Department of Transportation and Public Facilities (DOT&PF) considered six build alternatives that encompass the full range of alignments and material sources. This memorandum describes each build alternative, lists design criteria and descriptions, provides a rough order of magnitude estimate of costs, evaluates the prudence and feasibility of the build avoidance alternative (Alternative 1). It also summarizes factors considered (disadvantage and advantages) in determining which non-avoidance build alternative (Alternatives 2A, 2B, 2C, 3, or 4) results in the least overall harm. The avoidance and non-avoidance build alternatives evaluated are:

Avoidance Build Alternative

- Alternative 1: Stay Within Existing Right-of-Way (ROW)

Non-Avoidance Build Alternatives

- Alternative 2 (A, B, and C): Shift into Turnagain Arm
- Alternative 3: Shift Inland at Windy Corner
- Alternative 4: Tunneling

1.0 ALTERNATIVE 1: STAY WITHIN EXISTING ROW

Alternative 1 is the Section 4(f) Impact Avoidance Alternative and limits the cut and fill to within the existing ROW. Maintaining project limits within existing ROW avoids impacts to the Chugach State Park (CSP) and the Alaska Railroad Corporation (ARRC) railroad tracks, thus there is no use of Section 4(f) property and no required conversion of Section 6(f) property to transportation use. Alternative 1 is shown on Figure 1 in Attachment A.

1.1 Alternative 1 Design Criteria

As the Seward Highway alignment winds between the Chugach Mountains to the north and the ARRC tracks and Turnagain Arm to the south, drivers negotiate five curves within the project area. The design speed of 65-mph was applied to this alternative, but due to constraints in ROW, horizontal separation from railroad tracks, curve lengths, and rock catchment width, the design speed can only be met for curve #1; it must be lowered to 55-mph for curve #4 and to 60-mph for curves #2, #3, and #5.

With a higher design speed the curve radius and lengths are increased resulting in a flatter curve allowing drivers to feel more comfortable negotiating the curve at higher speeds and provide drivers a greater margin of error. A 65-mph design speed requires a minimum 1,660 foot radius. A 60-mph design speed lowers the required radius to 1,330 feet and a 55-mph design speed

allows for a much tighter curve with a minimum radius of 1,060 feet. Curves with a smaller radius, while allowing for tighter curves, cause drivers to slow down to feel comfortable negotiating the curve. Additionally, higher design speed increase the sight distance providing drivers longer reaction times for obstacles in or adjacent to the roadway, such as vehicles parked on the shoulders.

A 25-foot horizontal separation is required between the centerline of the railroad and non-railroad facilities, including embankments, retaining walls, and any other accompanying features according to the *Technical Standards for Roadway, Trail, and Utility Facilities in the ARRC Right-of-Way (ARRC January 2014)*. This limits movement of the roadway alignment towards Turnagain Arm near curve 2. Alternative 1 requires a retaining wall between the railroad and the road, as shown in Figure 1-1.

The DOT&PF Alaska Highway Preconstruction Manual recommends a rock catchment width of 30 feet for cuts taller than 60 feet, though a minimum of 25 feet is allowed where required to stay within ROW. Rock catchments are required to prevent falling rocks from entering the roadway.

1.2 Alternative 1 Design Description

Alternative 1 realigns this segment of the Seward Highway improving the alignment to the extent possible while remaining within the existing ROW. The typical section for Alternative 1, shown in Figure 1-1, consists of a two-lane, undivided highway with 12-foot lanes and 8-foot shoulders similar to the existing roadway. Alternative 1 utilizes them minimum rock catchment width of 25 feet to maximize use of the existing ROW.

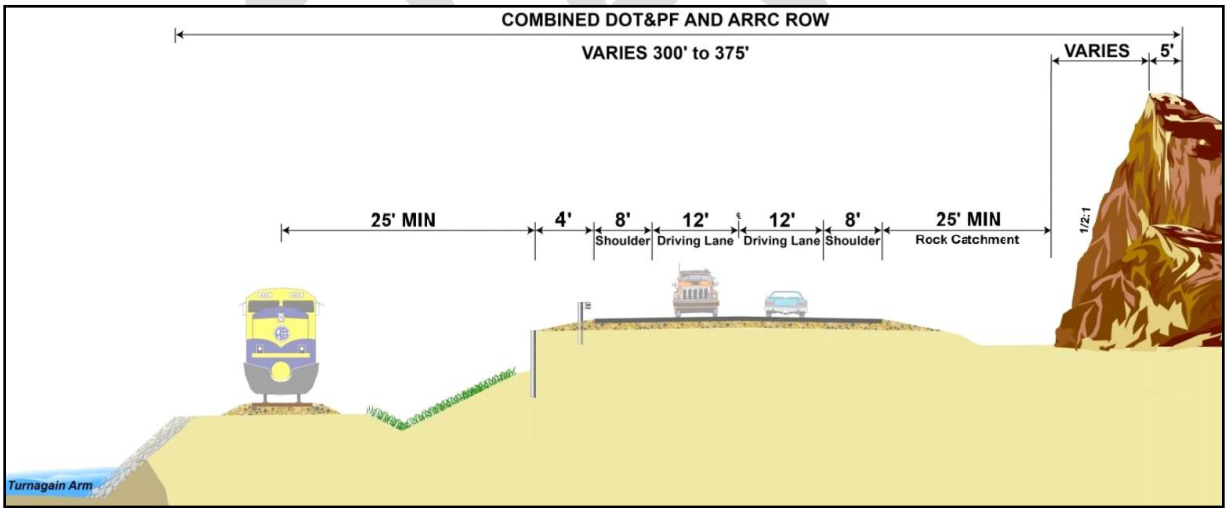

Figure 1-1: Alternative 1 Typical Section

The alignment proposed under Alternative 1 improves the five curves to the extent feasible, maximizing the curve radii by adjusting the alignment as follows:

- Curve 1 – Curve radius is maintained at 65-mph design speed.

- Curve 2 – Improvements to this curve are limited due to space constraints, horizontal separation between the railroad and highway, and minimum required rock catchment cutting into the steep cliffs adjacent to CSP. Requirements for a 65-mph design speed cannot be met at this location leading to a maximum design speed of 60-mph.
- Curve 3 – Space constraints at this location due to ROW, minimum required rock catchment, and adjacent curves provide insufficient space for a 65-mph design speed. The maximum design speed of this curve is 60-mph.
- Curve 4 – Improvements to this curve are limited by the proximity of curves 3 and 5. In order to meet all required design criteria for these three curves the design speed of this curve must be lowered to 55-mph.
- Curve 5 – Space constraints at this location due to ROW, proximity of curve 4, and minimum distance between curves provide insufficient space for the required curve length for a 65-mph design speed. The maximum design speed of this curve is 60-mph.

Table 1-1 summarizes the existing and improved geometry of the curves for the horizontal alignment of Alternative 1. As shown in the table, the radii is increased for all five curves but four of them still fall short of meeting the requirements for a 65-mph design speed.

Table 1-1: Alternative 1 Alignment Curve Summary

Curve Number	Existing Radius (ft)	Existing Design Speed (mph)	Alternative 1 Radius at Inside Shoulder (ft)	Alternative 1 Design Speed (mph)
C1	2,865	65	3,010	65
C2	1,206	55	1,530	60
C3	1,432	60	1,680	60
C4	996	50	1,060	55
C5	996	50	1,990	60

The cost for Alternative 1 is significantly lower than the other alternatives considered because the railroad alignment is unchanged and therefore it requires significantly less fill from outside the project area. Table 1-2 provides the Alternative 1 planning level cost estimate.

Table 1-2 – Alternative 1 Cost Estimate

Alternative 1	
Construction Estimate	$23,500,000
25% Contingency	$ 5,900,000
Estimated Construction Total	$29,400,000
30% CE, PE, ICAP	$ 8,900,000
Estimated Project Total	**$38,300,000**

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1.3 Prudent and Feasible Evaluation of Alternative 1

Alternative 1 is evaluated below according to the Section 4(f) prudent and feasible criteria.

- Community Impacts - Alternative 1 would not result in substantial adverse community impacts to adjacent homes, businesses, or other improved properties.
- Cost - Alternative 1 would not substantially increase roadway or structure cost. Alternative 1 has the lowest cost ($38,300,000) of all build alternatives considered.
- Social/Economic/Environmental Impacts - Alternative 1 would not result in substantial adverse social, economic, or environmental impacts.

However, Alternative 1 would not be prudent for the following reasons.

- Transportation Needs - Alternative 1 would not meet the identified transportation needs. This alternative would not include the design improvements (listed below) needed to substantially improve safety and improve traffic operations. Thus, the elevated high-severity crashes and traffic congestion in the project area would likely continue in accordance with historical trends.
    - Roadway curves would remain sharper than allowed for the recommended design speed, resulting in unsafe passing conditions, reduced sight distance, reduced margin for driver errors, and inconsistent travel speeds. The broken back curve would remain and continue to be challenging for motorists to negotiate.
    - There would continue to be frequently stopped vehicles close to through traffic and high traffic speed differentials.
    - The design speed of 65-mph would not be met. It was applied to this alternative, but it cannot be met due to constraints in ROW, horizontal separation requirements from railroad tracks, curve and tangent lengths, and rock catchment width. Design speed would need to be limited to 55 or 60-mph. The posted speed would be limited to 55-mph.
    - During times when there is little traffic congestion, some drivers would continue travel at speeds exceeding the design speeds.
    - There would be minimal or no separation of though traffic, turning traffic, opposing traffic, parked vehicles, and pedestrians. Pedestrians would continue to lack safe locations to view wildlife.
    - This alternative does not provide a median that would separate northbound and southbound through traffic. The lack of separation would continue to result in the potential high severity crashes, in particular head on collisions that are significantly mitigated by separation of opposing traffic.
    - There would be no new auxiliary lanes to improve ingress/egress or to allow for relief of traffic congestion.
- Social Impacts - Alternative 1 has substantial potential for public and agency opposition due to reduced safety improvements in comparison with other alternatives.
- Unique Engineering, Traffic, Maintenance, and Safety Problems - Alternative 1 would result in unique traffic, maintenance, and safety problems.
    - Excavation further into the slopes at Windy Corner may lead to increased DOT&PF maintenance costs and safety issues. Some adjacent slopes are comprised of loose, friable material, and may have a higher rate of sliding towards the highway if disturbed. This would require more dangerous maintenance response operations and more safety hazards related to rockfall on the highway.
    - This alternative does not address the unique traffic and safety hazards associated with drivers slowing or stopping on the highway when Dall sheep are present, slowing and

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stopping commuter and commercial traffic trying to efficiently travel the only highway between Anchorage and other communities to the south.
    - The unique character of this portion of the highway, squeezed between the mountains and Turnagain Arm, with safety hazards caused by the mixed visitor and commercial traffic, distracting natural and scenic views, and regular rockfall potential, on a critical state highway that is the sole highway connection between the Kenai Peninsula and Anchorage creates problems of great magnitude when compared to the proposed project's effect on the less than one percent of CSP affected by the proposed action.
- Benefit Section 4(f) Property - Alternative 1 would result a substantial missed opportunity to benefit a Section 4(f) property
    - Alternative 1 would not include the new mountainside park facilities including substantial proposed recreational amenities benefiting CSP (Figure 2 in Attachment A). See the discussion of amenities in the Net Benefit Programmatic 4(f) Evaluation Form, Section IV.2. Prudent and Feasible Evaluation, D.
    - Alternative 1, unlike Alternatives 2 and 3, does not provide an emergency access ramp for water rescue operations in the Turnagain Arm resulting in a missed opportunity to provide this benefit to CSP visitors participating in water activities.

2.0 ALTERNATIVE 2: SHIFT INTO TURNAGAIN ARM

Alternative 2 realigns this segment of the Seward Highway and reconstructs the road as a divided highway. The ARRC tracks would be realigned and relocated farther into Turnagain Arm. The space created by the road and rail realignment would further improve safety by accommodating improved parking/turnout facilities on the mountainside of the highway. The proposed highway alignment is shown in both Figure 2 and 4 in Attachment A.

2.1 Alternative 2 Design Criteria

Posted speeds vary between Anchorage and Girdwood from 55 to 65-mph. Recent Seward Highway projects south of Bird trend toward a 65-mph design and posted speed. Although there are no immediate plans to change the posted speed in the Windy Corner area, a 65-mph design speed will give the DOT&PF the future flexibility to adjust the posted speed, if desired. A 65-mph design speed will also improve safety by:

- increasing curve radii and associated sight distance creating a greater margin of error for drivers,
- making progress towards a more consistent design speed in the Seward Highway corridor, and
- accommodating the speed the majority (85 percent or more) of motorists who travel at or below under free-flow conditions when not impacted by traffic or other conditions such as weather.

2.2 Alternative 2 Design Description

Alternative 2 realigns Seward Highway to meet 65-mph design criteria. The typical section for Alternative 2, consists of two 12-foot-wide through lanes, two 12-foot-wide auxiliary lanes, 8-foot-wide outside shoulders, 4-foot-wide inside shoulders and a 24-foot-wide depressed median separating northbound and southbound traffic. In areas where the roadway alignment is adjacent

to the rock cliffs, Alternative 2 provides a rock catchment area that meets or exceeds the recommended width of 35 feet.

To keep rock cuts within the existing ROW, Alternative 2 moves the rail alignment pushing it up to 435 feet into the Turnagain Arm. Alternative 2 includes new parking facilities in the area created by the new road and rail alignments Key aspects of these new parking facilities include a 12-foot-wide southbound left-turn lane and a median to separate the highway which will limit the turning movements into and out of the parking areas to one location. Alternative 2 provides an emergency access ramp to Turnagain Arm to facilitate water rescues.

2.3 Options for Obtaining Material

Alternative 2 requires a significant amount of fill in order to shift the rail and road alignments into the Turnagain Arm. Table 2-1 summarizes the anticipated volume of fill material required. Three options for obtaining material were evaluated as part of this alternative; utilize the quarry area that is established for highway upgrades as noted in the CSP MP at MP 109 (Alternative 2A) and if necessary extract material from a location at MP 104, obtain material from cuts within the Seward Highway ROW (Alternative 2B), or obtain material from outside the Seward Highway corridor (Alternative 2C). The Alternative 2 roadway alignment will be the same regardless of the option selected for obtaining the required material.

Table 2-1: Fill Material Quantities Required for Alternative 2

Material	Volume (CY)
Borrow and Aggregate	1,900,000*
Riprap and Coastal Armor	160,000
Estimated Total:	2,060,000

*Rounded quantities from January 2017 revised PIH Submittal

2.3.1 Material Location – MP 109 & MP 104 (Alternative 2A)

The material location at MP 109 is anticipated to contain sufficient quantity and quality of material to produce aggregate, riprap, and potentially armor stone. This material location is approximately two miles from the project area, making it one of the closest possible options. Although it is situated along the Seward Highway, the design provides for reducing public visibility by leaving a buffer with existing vegetation in place adjacent to the highway. In the unlikely event that MP 109 is not sufficient to meet the project needs, material extraction would occur near MP 104. Material locations utilized would be reclaimed and return to park use when the material extraction is complete. The DOT&PF Construction Contractor will submit reclamation plans to ADNR for review and approval prior to material extraction. To mitigate for impacts to CSP from the use of MP 109 and potential use of MP 104, DOT&PF would construct new mountainside park facilities in the area created by relocating the rail and road alignment into Turnagain Arm as shown on Figure 2 in Attachment A. The proposed park facilities are discussed in more detail in Section 2.4.1 below.

2.3.2 Material Sites – Within Seward Highway Right-of-Way (Alternative 2B)

Available material within the existing highway ROW is limited to narrow cuts in areas where the existing embankment extends far enough into the highway ROW to render a meaningful linear excavation between the existing road and the ROW limits. Seven sites were selected based on availability of large quantities of material within the ROW and proximity to the project site. The material sites identified along the Seward Highway are within six miles of the project area (Figure 3, Attachment A). Existing topographic information was used to estimate material quantities available for each site. The vertical rock cut slopes would extend to the Seward Highway ROW, designed at a 0.5 Horizontal (H):1 Vertical (V) slope per previous DOT&PF geotechnical recommendations. The material sites also contain a sufficient rock slope to use controlled blasting to extract the material. This would increase the length of required safety zone for beluga whales during construction by approximately three miles (MP 110 to MP 113.3).

Additional benefits of obtaining material within the ROW include reducing the risk to the travelling public by stabilizing slopes that have been prone to rockfall issues. These slopes were identified in The *Seward Highway Rock Slope Stability Geotechnical Report, Central Region (CR) DOT&PF Materials Section (Ondra, 1991).* CR Maintenance and Operations (M&O) materials staff identified six locations adjacent to these material sites as needing a flat-bottom rock catchment area due to the rock fall hazard between Indian and Potter Marsh. All seven of the material sites were also identified by the Statewide Unstable Slope Management Program (USMP) as rockfall hazard sites.

Using assumed overburden depths and historical data regarding rock quality, the estimated total volume available from the material sites is 2.3 million cubic yards and includes material produced by sliver cuts and controlled blasting techniques. Further geotechnical exploration of the sites would be required to determine quality and to confirm the type of material available and the ability to access the top of slope at each material site.

2.3.3 Material Source – Outside Seward Highway Corridor (Alternative 2C)

DOT&PF solicited an independent contractor's evaluation of probable construction costs for purchasing and transporting material from outside the corridor. The contract was awarded to Granite Construction (Granite). Granite's qualifications and further description of their evaluation methodology are included in Attachment B.

DOT&PF requested estimates for a broad spectrum of existing and potential material sources and haul methods. The following areas were considered for material sources:

- existing material sources in Anchorage, Eklutna, and Palmer;
- past material sources near Portage; and
- material sources near Cook Inlet that could reasonably be barged to the site.

The alternative analysis focused exclusively on the logistics and costs associated with the material acquisition and transportation of materials to the project site. Granite identified specific

locations that are currently used as material sources and identified approximate locations where new material sources could potentially be developed.

Granite evaluated three methods that could be used to deliver materials to the project site including barge, train, and conventional truck haul. The method evaluated was dependent on several factors including location, cost, and available existing infrastructure to support this method. In some cases, more than one method of transportation was evaluated. The project requires that material be developed from a rock source (not alluvial) to allow manufacture of shot rock, rip rap, and coastal armor which are not producible in alluvial sources. Evaluations were limited to the following rock material sources.

- Portage Valley: Several locations have provided materials for previous DOT&PF projects. This location was considered for transportation by train and truck.
- Eklutna: Potential source could be developed in this area that would meet the requirements for this project. This location was considered for transportation by train.
- Granite Cove Quarry (Kodiak, Alaska): This quarry has been operational in the past and is currently active with an operator. This quarry is located on Kodiak Island and is limited to water access via barge only.
- Diamond Point Quarry (Iliamna Bay, Alaska): This quarry is a new site and has not been developed or provided materials previously. Located in Iliamna Bay within Cook Inlet, this site is tidewater influenced and limited to water access via barge only.
- Skookum Quarry: This is an active quarry site that supplies all types of manufactured rock products located near Chugiak off the Old Glenn Highway. This location was considered for transportation by truck only. Currently there are not rail lines or spurs adjacent to this source.
- Mat-Su Valley sites: Non-alluvial rock source locations in the Mat-Su Valley are limited and primarily located outside of Palmer or Wasilla. At this distance from the project, train and truck transport cost become prohibitive compared to other identified sources. For this reason, Granite did not provide cost information for this location.

Granite's cost estimate associated with the material acquisition and transportation of materials to the project site are shown in the following table. Attachment B provides notes, assumptions, and additional cost breakdown. These costs do not include any infrastructure (e.g. rail siding or barge docking) or staging areas required for handling the material once they arrive at the project site.

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Table 2-2 – Summary of Material Acquisition and Transportation Costs

Material Source & Haul Method	Estimated Acquisition & Transportation Cost
Portage Valley – Truck	$62 Million
Portage Valley – Train	$62 Million
Eklutna – Train	$50 Million
Granite Cove – Barge	$110 Million
Diamond Point – Barge	$78 Million
Skookum Quarry (Chugiak) – Truck	$50 Million

Table 2-3 provides the Alternative 2 planning level cost estimates for each of the options analyzed to provide the required material for the project. The material source at Eklutna was identified by Granite as the least expensive option for obtaining material from an outside source, so it was utilized as the source for the Alternative 2C cost estimate.

Obtaining material from MP 109 is the least expensive and most efficient option for acquiring and transporting the necessary materials. Costs for obtaining material from MP 104 are anticipated to be similar to the costs for MP 109. Material sites identified within the Seward Highway DOT&PF ROW require increased source development given multiple sites, increased haul time, increased blasting costs due to more challenging access, and increased traffic control given multiple material sites located adjacent to the highway. The least expensive material source identified outside the Seward Highway corridor is at Eklutna, however acquiring fill material from the Eklutna material source is approximately twice the cost of MP 109 due to the significantly increased transportation costs.

Table 2-3 – Alternative 2 Cost Estimate

	MP 109	Seward Highway Corridor	Outside Sources (Eklutna)
FILL MATERIAL ESTIMATE[2,3]	$28,150,000	$ 39,250,000	$ 54,600,000
MOUNTAINSIDE PARK FACILITIES	$2,600,000	$ 100,000	$ 100,000
ADDITIONAL CONSTRUCTION COSTS	$25,000,000	$25,000,000	$25,000,000
CONSTRUCTION ESTIMATE	**$55,750,000**	**$ 64,350,000**	**$ 79,700,000**
25% CONTINGENCY	$13,950,000	$ 16,100,000	$ 19,900,000
EST. CONSTRUCTION TOTAL	**$69,700,000**	**$ 80,450,000**	**$99,600,000**
30% CE, PE, ICAP:	$20,900,000	$ 25,150,000	$ 29,900,000
EST. PROJECT TOTAL[1]:	**$90,600,000**	**$104,600,000**	**$129,500,000**

Notes:

[1]Costs rounded to nearest $50,000.

[2]Fill material estimate includes traffic maintenance and control.

[3]Used fill material unit costs from Material Acquisition and Transportation Cost Analysis (Attachment B).

2.4 Least Overall Harm Considerations - Alternatives 2A, 2B, & 2C

2.4.1 Alternative 2A - Shift Into Turnagain Arm, Use MP109 and MP 104 material locations (Proposed Alternative)

Alternative 2A has been evaluated to determine which non-avoidance alternative results in the least overall harm. The following factors were considered. A summary of the Least Overall Harm Analysis is located in Appendix C of the Net Benefit 4(f) form.

- Community Impacts - As noted under the Noise discussion of the Social/Economic/ Environmental Impacts section below, road construction would have temporary noise likely to be audible in the neighboring communities of Rainbow and Indian. Overall, Alternative 2A would not result in substantial adverse community impacts to adjacent homes, businesses, or other improved properties.
- Cost - Alternative 2A would not substantially increased roadway or structure cost. The estimated cost of Alternative 2A ($90,600,000) is the lowest of the build alternatives that meet the project's transportation purpose and need.
- Transportation Needs - Alternative 2A would not result in a failure to meet the identified transportation needs.
- Unique Problems – Alternative 2A would not result in unique engineering, traffic, maintenance, or safety problems.
    - This alternative would include the design improvements needed to substantially improve safety and improve traffic operations.
    - Construction related crash increases are substantially less than those anticipated with Alternative 2B since there will be fewer material extraction access points during construction. Transport of material to the project area from MP 109 is estimated to increase the crash rate for the highway segment from MP 107 to MP 109 during construction by 40%. A potential for an estimated additional 1.2 fatal/major injury crashes and 4.3 non-major injury/property damage only crashes, beyond what the corridor historically experiences. Both material locations, MP 109 and MP 104 are approximately 2 miles from the project area, If material is needed from the MP 104 location, transportation of the material to the project area is estimated to increase the crash rate for the highway segment from MP 104 to MP 105.8 during construction by 40%. A potential for an estimated additional 1.2 fatal/major injury crashes and 4.3 non-major injury/property damage only crashes beyond what the corridor historically experiences.
- Unusual/Unique/Extraordinary Magnitude Problems - Alternative 2A would not result in impacts, costs, or problems truly unusual or unique, or of extraordinary magnitude when compared with the proposed use of the Section 4(f) property after taking into account measures to minimize harm and mitigate for adverse uses, and enhance the functions and value of the Section 4(f) property.
- Benefit Section 4(f) - Alternative 2A would not result in substantial missed opportunity to benefit a Section 4(f) property.
    - Alternative 2A would include new mountainside park facilities with substantial proposed recreational amenities benefiting CSP (Figure 4 in Attachment A). See the discussion of amenities below under Section 4(f) Lands Mitigation and in the Net Benefit Programmatic 4(f) Evaluation Form Section IV.2. Prudent and Feasible Evaluation, D.
    - Alternative 2A would provide an emergency access ramp to facilitate water rescue operations.

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- Social/Economic/Environmental Impacts - Alternative 2A would not result in substantial adverse social, economic, or environmental impacts. Impact would occur to the various resources listed below, however after taking into account the proposed minimization and mitigation measures the impacts are not considered substantially adverse.
  - Section 4(f) Lands

    Impacts: Alternative 2A would permanently use approximately 26.3 acres if Section 4(f) tidelands for transporation right-of-way (ROW) and temporarily use 35.4 acres for material extraction. CSP encompasses approximately 495,000 acres. The Turnagain Arm Unit of the Park contains approximately 98,000 acres, including 15,000 acres of tidelands and waters of Turnagain Arm. The proposed 4(f) use is less than one hundredth of one percent of CSP. There are no established recreational use within the 35.4 acres proposed for material extraction. Informal and game trails may be present but there are no developed and maintained recreational trails or other amenities. Alternative 2A would also realign approximately 2 miles of the National Register-eligible ARRC tracks. The Section 106 process concluded the project would have no adverse effect on the railroad. The Section 4(f) exception under CFR 774.13(a)(3) therefore applies since the proposed action would not adversely affect the historic qualities this segment of the railroad that cause it to be eligible for the National Register.

    Mitigation: To mitigate for the temporary and permanent use Section 4(f) CSP lands DOT&PF proposes to relinquish 14.7 acres of ROW to the CSP. In addition, DOT&PF proposes approximately $2.5 million worth of improvements and amenities to the CSP associated with constructing new mountainside park facilities on the 14.7 acres of DOT&PF ROW relinquished to the CSP. The new park facilities would include amenities, such as viewing platforms, interpretive signs, vault toilets, and increased parking. These upgraded recreational facilities are compatible with the CSP Management Plan for this park unit. They are also consistent with ADF&G's wildlife recreation and education planning for Potter Marsh to Girdwood Corridor to add viewing improvements, parking, and interpretive stations at Windy Corner (ADF&G, 2000). With implementation of mitigation measures recreational activities within CSP would be enhanced as a result of the project resulting in a net benefit to the CSP. No mitigation is proposed for the effects of the project on the National Register-eligible ARRC tracks since the Section 106 process concluded no adverse effect without the requirement for mitigation measures.
  - Section 6(f) Lands

    Impacts: Alternative 2A would convert approximately 39.56 acres of Section 6(f)-protected lands to transportation use. This includes 4.16 acre of rocky outcrops for transporation right-of-way (ROW) and 35.4 acres of undeveloped forest uplands for material extraction. CSP would retain ownership of the 35.4 acres of material extraction locations, but Section 6(f) protection would be removed from this land and therefore this would be considered a Section 6(f) conversion of use. The National Park Service has completed an EA and Finding of No Significant Impact (FONSI) and found that, with incorporation of mitigation measures (proposed replacement lands), the 6(f) land conversion would have no significant impact to the CSP.

    *Mitigation***:** Section 6(f) of the Land and Water Conservation Act requires that parkland converted to transportation use be replaced with property of at least equal fair market value and of reasonably equivalent usefulness and location. To satisfy this requirement and mitigate for the project's 39.56 acres of 6(f) conversion, DOT&PF would relinquish 14.7 acres of ROW to the CSP. The estimated fair market value ($231,300) of the 14.7 acres of land to be relinquished to the CSP is greater than the

that ($193,700) of the 39.56 acres of CSP 6(f) land converted to transportation use. Appraisal documents are available in Appendix C of the Section 6(f) Environmental Assessment located on the documents page of the project website: www.windycorner.info.

The National Park Service has completed an EA and Finding of No Significant Impact (FONSI) indicating the proposed replacement land meets the project's Section 6(f) conversion requirements. The 6(f) FONSI was approved by the NPS on May 30, 2019. The LWCF FONSI is available as Appendix B of the Section 4(f) document. The LWCF EA and FONSI are located on the documents page of the project website: www.windycorner.info.

Visual Impacts

Impacts: Alternative 2A would affect the aesthetics in a small portion of the Turnagain Arm Unit of CSP. The MP 109 material location would result in visual impacts for motorists for a length of approximately 1,400 feet northbound; and approximately 2,400 feet southbound. The MP 104 material location would result in visual impacts for motorists for a length of approximately 4,600 feet northbound; and Approximately 3,700 feet southbound.

Mitigation: Proposed material location development has been minimized. The MP 109 material location is an expansion of a former material extraction location. The effect would be further minimized through inclusion of a 100-foot wide topographic and vegetated screen between the MP 109 material site and the Seward Highway.

- Endangered Resources

Impacts: The placement of fill in Turnagain Arm would reduce critical habitat for the endangered Cook Inlet Beluga Whale (CIBW). The waters of Turnagain Arm are home to the CIBW population (*Delphinapterus leucas*). The 26.3 acres of Turnagain Arm to be impacted within the project is designated critical habitat for the CIBW. DOT&PF has coordinated with National Marine Fisheries Service (NFMS) and NMFS has concurred that, with implementation of mitigation measures, Alternative 2A is not likely to adversely affect the CIBW population or adversely modify their critical habitat. Agency consultations and additional information are available on the documents page of the project website: www.windycorner.info.

Mitigation:

1. DOT&PF will provide, though the Section 404 permitting process, compensatory mitigation for the unavoidable loss of intertidal mudflats.
2. In-water fill placement will not occur from April 1 through June 15.
3. Fill placement will only occur during daylight hours and will be restricted to within six hours of low tide (three hours before and/or after local low tide).
4. On-shore blasting will only occur during daylight hours and will be restricted to within six hours of low tide (three hours before and/or after local low tide).
5. Blasting activities will not occur at or below the intertidal zone.
6. Blasting noise will be mitigated through use of observers to determine presence of beluga whales within a 4,921-foot (1,500 meter) radius. If whales are sited, blasting activities will be paused until the whales are outside the radius.

- Anadromous Fish

Impacts: The placement of fill in Turnagain Arm would reduce essential fish habitat (EFH). The 26.3 acres of intertidal mudflats proposed to be filled in the project area are anadromous waters that support the five species of Pacific salmon. DOT&PF has consulted with the National Marine Fisheries Service (NMFS) and with the

implementation of conservation measures the construction and operation of the proposed project would not adversely affect EFH and anadromous fish. Agency consultations are available in Appendix H of the LWCF EA (Feb 2019) located on the documents page of the project website: www.windycorner.info.

Mitigation: Alternative 2A will recreate similar habitat to that being impacted by placing coastal armor stone and riprap on the new embankment. DOT&PF will provide compensatory mitigation for the loss. In water construction will be avoided April 1 to June 15 and will be conducted at low tide to the extent possible. All dredge material must be free of contaminants prior to disposal. Fill below the high tide line will be clean shot rock and will be placed when the site is dewatered by lower tide stages. During construction, the fill site will be graded to prevent ponding on the fill surface that could trap fishes between high tide.

- Dall Sheep

  Impacts: Alternative 2A would directly impact approximately 9.4 acres of high value Dall sheep habitat. Excavation and blasting of the existing rock slope at Windy Corner may affect Dall sheep during lambing. With implementation of NMFS- and ADF&G-recommended avoidance, minimization and mitigation measures, the proximity impacts of the project are not expected to impair the wildlife resources of the Park.

  Mitigation: *Design Measures*: Dall sheep habitat impacts have been minimized in the design process by completely avoiding the high-value mineral lick habitat above Windy Corner and by limiting other habitat impacts to within the existing ROW. By limiting rock cut to within the ROW impacts to Dall sheep habitat have been decreased from Alternative 3 (7.4 acres) and Alternative 4 (3.0 acres) to acres. *Construction Measures*: No blasting would be conducted during the period from May 10th through July 15th to avoid adverse impacts to Dall sheep during lambing. No blasting would occur when Dall sheep are present within a quarter-mile except that, due to the round-the-clock construction schedule and safety concerns regarding explosives, traffic control, and public safety once the explosives are loaded, this recommendation cannot be practicably implemented. Coordination documentation is available in Appendix E of the Scoping Summary Report located on the documents page of the project website: www.windycorner.info.

- Trails

  Impact: The Turnagain Arm Trail (TAT) is the nearest interactive recreational feature. The TAT does not enter or cross any of the remaining uplands proposed for disturbance. The southern terminus of the TAT at Windy Corner, would be temporarily closed during construction.

  Mitigation: Trailheads at Potter Creek, McHugh Creek, and Rainbow would remain open.

- Access

  Impact: During construction, access and parking within the project area, including the Goats Head Soup climbing area and the Windy Corner Trailhead, would be temporarily limited for the safety of users and construction staff

  Mitigation: Access to Falls Creek Trailheads and CSP lands not impacted by the project would be maintained during construction. Given the number of Park access points along the Seward Highway, the temporary restriction of these areas would not impair overall access to the Park.

- Rock Climbing

  Impact: Recreational rock climbing at Windy Corner would be affected. Access to climbing routes for rock climbers during construction would be limited for the safety of users and construction staff. The existing rock face at Windy Corner would require

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new excavation/blasting, which would result in the destruction of the five climbing routes closest to the Seward Highway at Goats Head Soup. These five routes (Goat's Head Soup, unnamed route, Jumpin' Silverfish, Indifference, and Project 5.12+) are within the existing Seward Highway ROW. Impact to 5 routes is the lowest number affected compared to the other build alternatives meeting purpose and need [2B(56 routes), 2C(5 routes), 3(13 routes)]

Mitigation: Impacts would be limited to the least valuable of the existing thirteen routes located at Goat's Head Soup. Discussions with area climbers have indicated that the routes likely to be removed are the least valuable and least usable climbing routes at Goats Head Soup (Figure 5). This is also supported by the low rankings for these routes on the rock-climbing website 'Mountain Project' (www.mountainproject .com). The remaining eight Goats Head Soup climbing routes would not be impacted.

- Water Activities

  Impact: Recreational use of Turnagain Arm, for activities such as windsurfing, would be interrupted at Windy Corner during construction. The 26.3 acres of mudflats and rocky outcrops proposed for highway realignment would no longer be usable for water sports,

  Mitigation: However, there would be ample remaining area for these water sports to continue during and after construction. Water activity effects would be mitigated by the proposed development of an emergency access ramp to facilitate water rescue operations. This will improve safety for those water activity recreationists
- Waters of U.S.

  Impacts: The 26.3 acres of Turnagain Arm proposed for fill are regulatory waters of the U.S. under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

  Mitigation: DOT&PF has initiated the permit process with the U.S. Army Corps of Engineers (USACE) for the proposed project to obtain a Section 10/404 Individual Permit for the proposed fill. On 10/1/2019, the USACE notified DOT&PF that they could accept the mitigation plan included with the application.
- Cultural Resources

  Impacts: The ARRC track from Portage to Potter (Turnagain Arm District of the Alaska Railroad, ANC-04057) has been determined eligible for the National Register of Historic Places. The Alaska State Historic Preservation Officer has determined the proposed project would have no adverse effect on the Turnagain Arm District of the Alaska Railroad.

  Mitigation: The Section 106 process resulted in a finding that the project would have no adverse effect on the Turnagain Arm District of the Alaska Railroad (ANC-04057) with no proposed mitigation measures.
- Noise

  Impacts: Road construction would have temporary noise impacts. Expected activities include drilling, rock excavation, material placement and other typical road construction activities. Blasting would occur at Windy Corner, to shift the alignment inland at the bluff face. Material location development and extraction (MP 109 and MP104) would include blasting, rock excavation and processing. Project construction would intermittently generate high noise levels on and adjacent to the site. These activities are likely to be audible in the neighboring communities of Rainbow and Indian. Concerning long-term traffic noise, a Traffic Noise Analysis was completed for the proposed project. The projected increase in noise levels resulting from the project

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would be barely perceptible (3dBA or less). Overall, noise levels would be temporary in nature and short in duration. Proximity impacts from noise would not substantially impair the use of CSP.

Mitigation: Project construction noise would be minimized with the implementation of best management practices (BMPs) as appropriate.

- Air Quality

  Impacts: Road construction would have temporary air quality impacts. Temporary emissions from equipment, dust, or burning debris would occur during construction. Blasting and excavation at the proposed MP 109 material location and potential MP 104 material location may incrementally affect air quality in the community of Rainbow and Indian, respectively. Construction emissions are not expected to exceed the National Ambient Air Quality Standards, because they are temporary in nature and short in duration. No long-term air quality effects are anticipated. The proposed project is located outside the Anchorage Carbon Monoxide Monitoring Network and Non-Attainment Boundary. Proximity impacts from air pollution would not substantially impair the use of CSP.

  Mitigation: Temporary air quality impacts would be minimized with the implementation of BMP during construction.

- Water Pollution

  Impacts: The proposed project would increase impervious surface in the project area resulting in a minor increase in peak discharges. Existing drainage patterns would not be affected by the project. Because Turnagain Arm has naturally high levels of background sediment, water quality impacts are expected to be minimal. With implementation of mitigation measures, temporary water quality impacts during construction are anticipated to be minimal. Proximity impacts from drainage changes or construction activities would not impair the use of CSP.

  Mitigation: Temporary construction water-quality impacts would be addressed through the Alaska Pollutant Discharge Elimination System (APDES) permit and Storm Water Pollution Prevention Plan (SWPPP). BMPs would be implemented under the APDES permit.

2.4.2 Alternative 2B - Construct Proposed Improvements with Material from Seward Highway ROW

Alternative 2B has been evaluated to determine which non-avoidance alternative results in the least overall harm. The following factors were considered. A summary of the Least Overall Harm Analysis is located in Appendix C of the Net Benefit 4(f) form.

Advantages

- Community Impacts - Alternative 2B would not result in substantial adverse community impacts to adjacent homes, businesses, or other improved properties.
- Engineering Problems - Alternative 2B would not result in unique engineering problems
- Transportation Needs - Alternative 2B would not result in a failure to meet the identified transportation needs

Disadvantages

- Cost - Alternative 2B would result in a substantially increased project cost. Extracting material from seven sites within the Seward Highway ROW would cost $18,100,000 more, ($108,700,000 versus $90,600,000) than with Alternative 2A.
- Traffic and Safety Problems - Alternative 2B would result in unique traffic and safety problems during construction.

- Alternative 2B would also require traffic control for each of the seven identified material sites. Each traffic control zone is anticipated to be approximately 3 miles long and would create traffic disruption from construction vehicles and activities that would directly impact traffic flow during blasting operations. Since the excavation would occur in seven locations within the ROW, it would be far less efficient than in locations off the highway or in a single location adjacent to the highway, thereby prolonging the construction duration and disturbance. It is anticipated to increase the duration of construction from two seasons for the proposed action (Alternative 2A) to three seasons.
- The most recent 10 years of crash data previously analyzed (i.e., 2003 to 2012) indicate that 2.1 fatal/major injury crashes and 9.7 non-major/property-damage-only (PDO) crashes occurred per year during the construction season (i.e., April to November) between MP 104.1 and 113.3 (i.e., the section being considered for material extraction), excluding the Windy Corner project area (i.e., crashes from MP 105.8 to 107.2). Assuming 3 years of construction work zones with lane closures are needed to extract the amount of rock required, an estimated 55% increase in crashes could potentially result in an estimated additional 3.5 fatal/major injury crashes and 16.0 non-major injury/PDO crashes beyond what the corridor historically experiences.
- Alternative 2B would result in safety issues, disruptions, and inefficiencies due to prolonged blasting immediately adjacent to the highway. Material extraction from the MP 109 location as part of the proposed action (Alternative 2A) would not result in these issues as blasting would not occur adjacent to the highway. In the unlikely event that material extraction for Alternative 2A was required at the MP 104 location, blasting would occur in only one location adjacent to the highway instead of seven as in Alternative 2B, thereby resulting in significantly less issues.
  - Lane closures would be required during blasting operations.
  - Motorists would be in closer proximity to blasting operations and more vulnerable to stray blasting material.
  - Driver frustration is likely to be greater due to increased driver time spent in traffic queues during each blasting period. More time would be needed for each blasting operation with Alternative 2B versus the proposed action since all excess material would need to be cleared from the highway and railroad embankment between blasting periods before traffic flow could resume.

- Economic Impact - Alternative 2B would result in substantial adverse economic impacts. There would be an increase in constructions seasons from two to three seasons and the inconvenient traffic delays are expected to have a negative impact on tourism.
- Visual Impacts - Alternative 2B would result in substantial adverse social and environmental impacts, specifically visual impacts to the surrounding CSP. Visual impacts would both be greater or more pronounced in comparison to the proposed alternative.
  - To obtain the needed material, Alternative 2B would create steep rock faces reaching up to 217 feet in height adjacent to the highway.
  - The vertical face of rock excavation is approximately 35 acres for Alternative 2B compared to 7 acres for the proposed alternative.
  - Alternative 2B would require seven locations along the highway for excavation of the needed material.
  - The total estimated length of roadway/rock excavation, from all seven sites, is approximately three miles long to provide the quantity of material that is deemed necessary for this concept to be successful. A comparison of the corridor excavation and visual impacts is found in Figure 3 in Attachment A.

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  - Depending on which of the identified material sites were developed, this alternative could excavate rock within the corridor creating new rock cuts that would be visible for up to or exceeding 5.5 miles of the Seward Highway between MP 104 and MP 113. This is approximately 10 times more linear visual impact than the proposed alternative (Alternative 2A), if all the materials were obtained from the MP 109 location, which would be largely screened through use of existing topography. In the unlikely event that Alternative 2A required material from the location at MP 104, the rock cuts could be visible for approximately 1 mile of the Seward Highway, which is 5 times less than Alternative 2B.
- Rock Climbing Routes - Alternative 2B eliminates 56 rock climbing routes scattered throughout the seven material sites from MP 104.1 to MP 113.3.
- Section 4(f) Benefit - Alternative 2B would result in a substantial missed opportunity to benefit a Section 4(f) property
  - Alternative 2B would not include the new mountainside parking facilities with substantial proposed recreational amenities benefiting CSP (Figure 4). See the discussion of amenities in the Net Benefit Programmatic 4(f) Evaluation Form, Section IV.2. Prudent and Feasible Evaluation, D.
- Maintenance Problems - Alternative 2B would result in unique maintenance problems. Excavation further into the slopes at Windy Corner can lead to increased maintenance costs and safety issues, as some adjacent slopes are comprised of loose, friable material, and may have a higher rate of sliding towards the highway.

2.4.3 Alternative 2C - Obtain material from distant source (3 options Train, Truck, Barge)

Alternative 2C has been evaluated to determine which non-avoidance alternative results in the least overall harm. The following factors were considered. A summary of the Least Overall Harm Analysis is located in Appendix C of the Net Benefit 4(f) form.

Advantages

- Community Impacts (All 2C Options) – Alternative 2C would not result in substantial adverse community impacts to adjacent homes, businesses, or other improved properties.
- Social Impacts (All 2C Options) – Alternative 2C would not result in substantial adverse social, economic, or environmental impacts.
- Transportation Needs (All 2C Options) – Alternative 2C would not result in a failure to meet the identified transportation needs
- Unique Maintenance Problems (All 2C Options) – Alternative 2C would not result in unique long-term maintenance problems. Short term roadway and barge offloading facility maintenance problems would occur as described below.

Disadvantages

All Offsite Material Source and Transportation Options:

- Cost – All Alternative 2C options would substantially increase roadway cost. Sourcing material from a distant site under Alternative 2C would substantially increase construction costs compared to Alternative 2A. The cost of material alone from a distant source, under a variety of transport options (truck/train/barge), would cost between $50 Million and $110 Million compared to $28 Million Alternative 2A. Using the least expensive option for Alternative 2C, Train Haul from Eklutna, would increase the total project cost by 43% compared to Alternative 2A.
- Section 4(f) Benefit All Alternative 2C options would result in a substantial missed opportunity to benefit a Section 4(f) property

- Alternative 2C would not include the new mountainside parking facilities with substantial proposed recreational amenities benefiting CSP (Figure 4). See the discussion of amenities in the Net Benefit Programmatic 4(f) Evaluation Form, Section IV.2. Prudent and Feasible Evaluation, D.

- Traffic and Safety Problems All Alternative 2C options would result in unique traffic and safety problems during construction. All Alternative 2C options are anticipated to increase the project construction time from two seasons (Alternative 2A) to three seasons. This will prolong traffic congestion and increased risk of crashes inherent to road construction zones.
- Economic Impact – All Alternative 2C options would result in substantial adverse economic impacts. There would be an increase in constructions seasons from two to three seasons and the inconvenient traffic delays are expected to have a negative impact on tourism.

2.4.3.1 Truck Options

- Traffic and Safety Problems - Alternative 2C truck transport options would result in unique traffic and safety problems during construction. Alternative 2C truck options would result in an approximately 15% increase in trucks and a 1% increase in all vehicles above the proposed Alternative 2A.
  - This would increase safety issues along the truck transportation route with trucks travelling longer distances in the traffic stream with other roadway users. Truck haul would require 150,000 total truckloads to deliver the material during the project duration.
  - This would also lead to secondary effects on traffic congestion.
  - Effects on road traffic and safety would occur along the entire haul route, not just along the Seward Highway.
- Maintenance Problems - Alternative 2C truck transport options would result in unique maintenance problems during construction.
  - Alternative 2C would increase highway maintenance related to the large volume of heavy loaded vehicles traveling extra-long-distances on the highway. This would lead to high levels of roadway wear-and-tear.
  - Effects on road maintenance would occur along the entire haul route, not just along the Seward Highway.

2.4.3.2 Train Options

- Traffic Problems – Alternative 2C train transport options would result in unique train traffic problems.
  - Train transport of materials would be limited by existing train schedules and availability of material storage and off-loading areas at Windy Corner. Train transport would require 1,700 train trips of 30 air dump rail cars.
  - Although there are small rail sidings near Indian and Rainbow, these would not be sufficient to accommodate the needed trains without expansion. In addition, existing train schedules require the use of the existing sidings to allow trains to pass when traveling in opposite directions.
  - As the temperatures get cold in the fall, moisture will cause operational challenges for the dump car air systems. Material will also start to freeze in the car beds requiring additional time and cost to continue working, limiting the anticipated train hauling season from April to November.
  - Material dumping from the train cars would occur from the main line over an estimated two hour period that would require careful scheduling between regularly scheduled train traffic. If the contractor is not able to work within these narrow windows, a temporary siding would have to be constructed adjacent to the existing alignment.

- The contractor would be significantly restricted in the pace of work by the ability to bring in material at a sufficient quantity to get the work done in two seasons, thereby resulting in an extra 1 ½ to 2 years of construction duration.
- Truck traffic is still a significant consideration for most material locations due to the need to transport material along public roadways from a borrow source to a track siding at Eklutna and Portage for loading.
- Train transport will also require additional material handling to move material from the rail car dump site to final placement.

- Environmental Impacts– All Alternative 2C options could result in substantial adverse impacts if a staging area for material delivery to the site is required. The length of new rail siding to accommodate 40 air dump rail cars and the sizing of the staging/storage area have not been determined; however these facilities would likely be constructed within CSP requiring both Section 4(f) and Section 6(f) regulations be met once a suitable location for the facilities was determined.

2.4.3.3 Barge Options

- Cost, Engineering, and Safety Problems– Barging materials to the project area presents challenges due to the extreme tides in Turnagain Arm and ice conditions. Using large barges, almost 500 barge loads would be required. A tug would be required onsite full-time to assist barge navigation at arrival and departure. Offloading facilities would be required at Windy Corner, including pilings, mooring dolphins, and sheet pile bulkhead. Bringing the barged material to the project area would cost an additional $22 to $82 million; these costs do not include construction of the required offloading facilities and tug. The substantially increase roadway cost associated with barging materials and the safety concerns of operating in Turnagain Arm make this alternative not prudent.
- Environmental Impacts– Barging would also increase environmental impacts from construction of offloading facilities and adding industrial marine traffic in Turnagain Arm, which could adversely affect the CIBW population and conflict with recreational water activities.
- Safety Problems– Barge transport would have safety problems associated with shallow depths, extreme tides, and ice conditions. These conditions would make it difficult for the barge to navigate the tidally influenced waters even with the assistance of a tug. Barge deliveries would have to be coordinated with the tides meaning any delays in the process could cause a barge miss the tide and be delayed until the next available tide.
- Unusual/Unique/Extraordinary Magnitude Problems - Alternative 2C would result in impacts, costs, or problems truly unusual or unique, or of extraordinary magnitude when compared to with the proposed use of the Section 4(f) property after taking into account measures to minimize harm and mitigate for adverse uses, and enhance the functions and value of the Section 4(f) property.
  - The barge options result in substantially greater adverse impacts to the endangered CI Beluga whale as a result of constructing offloading facilities.
  - Extraordinary costs would result from a variety of factors including the transport distance, the number of required barge loads, increase from two to three construction seasons, mobilizing and demobilizing each season, seasonal barge redecking, need for full-time navigation assist tug, market pricing of materials, large investment in offload facility temporary infrastructure, offload facility maintenance and operation, removal and restoration of the area impacted by the temporary infrastructure, risk of cost overruns with unpredictable weather and changing water conditions.
  - Unique schedule problems are anticipated as a result of risks associated with marine operation in the Cook Inlet and Turnagain Arm. Ideal water and weather conditions are not likely causing schedule interruptions and uncertainties.

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3.0 ALTERNATIVE 3: SHIFT INLAND AT WINDY CORNER

Alternative 3, similar to Alternative 2, realigns this segment of the Seward Highway and reconstructs the road as a divided highway. To balance the cut and fill quantities, the highway alignment is shifted further inland at Windy Corner, therefore the road and rail alignments do not push as far into Turnagain Arm as Alternative 2. The proposed highway alignment is shown in Figure 5 in Attachment A.

3.1 Alternative 3 Design Criteria

The design is similar to Alternative 2, with the exception that Alternative 3 impacts CSP along the inside of Windy Corner, where the cut slope extends approximately 200 feet into CSP. The vertical cut is designed at a 0.5H:1V slope per the *Geotechnical Observations and Summary – Proposed Material Sites* memorandum.

3.3 Alternative 3 Design Description

Alternative 3 realigns Seward Highway to meet 65-mph design criteria. The typical section for Alternative 3, consists of two 12-foot-wide through lanes, two 12-foot-wide auxiliary lanes, 8-foot-wide outside shoulders, 4-foot-wide inside shoulders and a 24-foot-wide depressed median separating northbound and southbound traffic. In areas where the roadway alignment is adjacent to the rock cliffs, Alternative 3 provides a rock catchment area that meets or exceeds the recommended width of 35 feet. Alternative 3 provides an emergency access ramp to Turnagain Arm to facilitate water rescues.

The *Geotechnical Observations and Summary – Proposed Material Sites* memorandum evaluated the proposed rock cut at Windy Corner (MP 106.9) and found that limited stabilization measures appear to be needed for the site. The memorandum proposed the following slope recommendations:

- Use 0.5H:1V slopes in rock;
- Use 10- to 15-foot wide benches; and
- Slope soil overburden at the top of the cut at 1.5H:1V due to relatively shallow slope above the site. Stabilization would be necessary.

Alignments were evaluated that balanced cut and fill within the project corridor by pushing the alignment inland which would provide more material with in the project limits thereby reducing the material required from sources outside the project limits. At the highest point the proposed cut slope for Alternative 3 is approximately 200 feet tall. Additionally, cut and fill balanced alignment would bring the segment of the alignment in the mudflats closer to the existing alignment resulting in less fill required for the project.

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Table 3-1 provides the Alternative 3 planning level cost estimate.

Table 3-1 – Alternative 3 Cost Estimate

Alternative 3	
Construction Estimate	$56,600,000
25% Contingency	$14,200,000
Estimated Construction Total	$70,800,000
30% CE, PE, ICAP	$21,300,000
Estimated Project Total	**$92,100,000**

3.4 Least Overall Harm Considerations - Alternative 3

Alternative 3 has been evaluated to determine which non-avoidance alternative results in the least overall harm. The following factors were considered. A summary of the Least Overall Harm Analysis is located in Appendix C of the Net Benefit 4(f) form.

Advantages

- Community Impacts - Alternative 3 would not result in substantial adverse community impacts to adjacent homes, businesses, or other improved properties.
- Cost - Alternative 3 would not result in substantially increased transportation facility or structure cost. Expected project costs for Alternative 3 would be comparable ($92,100,000) to the proposed Alternative 2A ($90,700,000).
- Transportation Needs - Alternative 3 would not result in a failure to meet the identified transportation needs
- Economic Impacts - Alternative 3 would not result in substantial economic impacts.
- Unique Problems - Alternative 3 would not result in unique engineering, traffic, or maintenance problems

Disadvantages

- Social and Environmental Impacts - Alternative 3 would result in substantial adverse impacts in these categories. Specifically the following impacts would result.
  - Wildlife Habitat - Substantial impacts would occur to Dall Sheep habitat above Windy Corner where 7.4 acres of high-value Dall Sheep habitat would reduce or eliminate one of the primary drivers (wildlife viewing) of recreational use in this area of the CSP. This alternative has the highest degree of impact on the unique Dall sheep habitat of all the alternatives considered. It would compromise a substantial portion of or eliminate the mineral lick area that is completely avoided in Alternative 2. Alternative 3 Dall Sheep habitat impacts conflict with strong public sentiment to avoid impacts to the high value sheep habitat at one of the most popular wildlife viewing areas on Turnagain Arm.
  - Endangered Resources

    Impacts: The placement of fill in Turnagain Arm would reduce critical habitat for the endangered Cook Inlet Beluga Whale (CIBW). The waters of Turnagain Arm are home to the CIBW population (*Delphinapterus leucas*). The 14.9 acres of Turnagain Arm to be impacted within the project is designated critical habitat for the CIBW. DOT&PF has coordinated with National Marine Fisheries Service (NFMS) and NMFS has concurred that, with implementation of mitigation measures, Alternative 3 is not likely to adversely affect the CIBW population or adversely modify their critical habitat. Agency

consultations and additional information are available on the documents page of the project website: www.windycorner.info.

Mitigation:

1. DOT&PF will provide, though the Section 404 permitting process, compensatory mitigation for the unavoidable loss of mudflats and rocky outcrops.
2. In-water fill placement will not occur from April 1 through June 15.
3. Fill placement will only occur during daylight hours and will be restricted to within six hours of low tide (three hours before and/or after local low tide).
4. On-shore blasting will only occur during daylight hours and will be restricted to within six hours of low tide (three hours before and/or after local low tide).
5. Blasting activities will not occur at or below the intertidal zone.
6. Blasting noise will be mitigated through use of observers to determine presence of beluga whales within a 4,921-foot (1,500 meter) radius. If whales are sited, blasting activities will be paused until the whales are outside the radius.

- Anadromous Fish

  Impacts: The placement of fill in Turnagain Arm would reduce essential fish habitat (EFH). The 14.9 acres of intertidal mudflats proposed to be filled in the project area are anadromous waters that support the five species of Pacific salmon. DOT&PF has consulted with the National Marine Fisheries Service (NMFS) and with the implementation of conservation measures the construction and operation of the proposed project would not adversely affect EFH and anadromous fish. Agency consultations are available in Appendix H of the LWCF EA (Feb 2019) located on the documents page of the project website: www.windycorner.info.

  Mitigation: Alternative 3 will recreate similar habitat to that being impacted by placing coastal armor stone and riprap on the new embankment. DOT&PF will provide compensatory mitigation for the loss. In water construction will be avoided April 1 to June 15 and will be conducted at low tide to the extent possible. All dredge material must be free of contaminants prior to disposal. Fill below the high tide line will be clean shot rock and will be placed when the site is dewatered by lower tide stages. During construction, the fill site will be graded to prevent ponding on the fill surface that could trap fishes between high tides.

- Visual Impacts - Substantial visual impacts would result from a rock cut face approximately 200 feet high and approximately half a mile long. This rock face would be highly visible (especially to southbound motorists) since it would be located on the point at Windy Corner. The visual effects of Alternative 3 are considered to be worse than the visual effects of the proposed Alternative 2A, due to the magnitude and visibility of the 200-foot cut face at Windy Corner, which was raised as one of the most concerning impacts during public meetings for this project.

- Section 6(f) Lands

  Impacts: Alternative 3 would convert approximately 4 acres of Section 6(f)-protected lands to transportation use. This is 4 acres of rocky outcrops for transportation right-of-way (ROW) The National Park Service has completed an EA and Finding of No Significant Impact (FONSI) and found that, with incorporation of mitigation measures (proposed replacement lands), the 6(f) land conversion would have no significant impact to the CSP.

  *Mitigation***:** Section 6(f) of the Land and Water Conservation Act requires that parkland converted to transportation use be replaced with property of at least equal fair market value and of reasonably equivalent usefulness and location

The National Park Service has completed an EA and Finding of No Significant Impact (FONSI) indicating the proposed replacement land meets the project's Section 6(f) conversion requirements. The 6(f) FONSI was approved by the NPS on May 30, 2019. The LWCF EA/FONSI is available as Appendix B of the Section 4(f) document located on the documents page of the project website: www.windycorner.info.

  - Rock Climbing Routes - Substantial impacts would occur to the rock climbing routes at Goat's Head Soup. The required rock cut would remove an all thirteen climbing routes.
  - Trail - Alternative 3 would require realigning approximately 210 feet of Turnagain Arm Trail.
  - Mudflats – Alternative 3 would fill approximately 14.9 acres of mudflats and rocky outcrops.
- Section 4(f) Benefit - Alternative 3 would result a substantial missed opportunity to benefit a Section 4(f) property
  - Alternative 3 would not include the new mountainside parking facilities with its substantial proposed recreational amenities benefiting CSP (Figure 4). See the discussion of amenities in the Net Benefit Programmatic 4(f) Evaluation Form, Section IV.2. Prudent and Feasible Evaluation, D.
- Unique Problems - Alterative 3 would result in problems that would be truly unusual or unique, or of extraordinary magnitude when compared with the proposed us of the Section 4(f) property under Alternative 2A. There has been strong public sentiment to avoid impacts to the unique Dall sheep habitat at Windy Corner as well as to minimalize the visual impacts of rock cut faces in this area. According to the Alaska DNR, Windy Corner provides one of the best Dall sheep viewing opportunities in Alaska. According to Alaska DFG, the Windy Corner area is the only place in the world where Dall sheep can be seen at sea level from a nearby road. Alternative 2A was developed to minimize impacts to this unique location by shifting the road into the Turnagain Arm rather than inland. In contrast Alternative 3 shifts inland and has the highest degree of impact on Dall Sheep habitat of the reasonable range of alternatives considered.

4.0 ALTERNATIVE 4: TUNNELING

Alternative 4 highway alignment leaves the existing Seward Highway ROW and pushes the alignment inland and includes the construction of a 2,250-foot-long tunnel through Windy Corner (Figure 6 in Attachment A).

Three conventional tunnel construction methods were considered for Alternative 4:

- Cut and Cover Tunnel - This type of tunnel is constructed in a shallow trench and then covered over. A cut and cover tunnel is not practical at this site due to the extreme depth (~400 feet) of excavation between the existing topography and the possible tunnel alignment.
- Boring - This type of tunnel is constructed using a Tunnel Boring Machine (TBM) that bores through rock/dirt. Each TBM is fabricated for the specific site conditions. This method is not practical at this site due to the high capital cost of fabricating a TBM. For comparison, the TBM recently used in Seattle to replace the Alaska Way Viaduct was manufactured in Japan and cost about $80 million. The estimated cost for a TBM to construct Alternative 4 could be comparable to the TBM used in Seattle.

- Drill & Blasting - New Austrian Tunneling Method (NATM) - This is the preferred method and the analysis for Alternative 4 as described below is based on this method. This type of tunnel is constructed by drilling and blasting in 20-foot to 30-foot segments. Rock bolts are then installed in the tunnel crown after each segment is drilled and blasted, before proceeding to drill and blast the next segment. This is the most practical and cost-effective type of tunnel construction for this site. The Portage Lake Tunnel constructed as part of the Whittier Access project was constructed using this method.

4.1 Alternative 4 Design Criteria

This alternative would provide safety improvements by increasing the road radius of curvature and associated sight distance. The tunnel cross section would consist of two 12-foot driving lanes with 8-foot shoulders, curb and gutter, and 3-foot sidewalks on both sides. The Alternative 4 cross-section is shown in Figure 7 of Attachment A.

The tunnel entrances and exits, also known as portals, are placed at each end. Because of the terrain through Windy Corner, the placement of the tunnel portals perpendicular to the roadway would create rock cuts along both ends up to 300-feet high adjacent to the roadway and 300 to 450-feet in length along the roadway. The minimum rock catchment area would likely be wider than the 25 feet with such high rock faces.

4.2 Alternative 4 Design Description

The key design elements of the tunnel are:

- Tunnel Support - Tunnel support would consist of rock bolts, chain link mesh, and shotcrete installed during tunnel excavation. Rock bolt spacing would be dependent on the type and quality of the rock. Areas of loose or weak rock encountered during the initial tunnel excavation may require different stabilization techniques.
- Portals - Portals would be constructed at both ends of the tunnel.
- Electrical Power - Electrical power would be needed at each end of the tunnel requiring infrastructure to support power delivery.
- Standby Electrical Power – To meet current National Electrical Code, the tunnel lighting and ventilation systems would be provided with standby electrical power. A power failure to these systems could create hazards or hamper rescue or fire-fighting operations. Standby electrical power would be provided at each electrical service location.
- Ventilation System - A ventilation system would be needed to remove the carbon monoxide from the vehicles and smoke from the tunnel in case of fire. There are three types of tunnel ventilation systems: longitudinal (used in the Whittier Tunnel), semi-transverse, and transverse. A transverse ventilation system would be the appropriate system for the Windy Corner tunnel. It would require a ventilation duct below each sidewalk to supply fresh air and a ventilation duct in the tunnel crown to remove exhaust. Carbon monoxide monitors mounted inside the tunnel would control the ventilation system. A building outside the portals would be needed to house the fans.
- Lighting System - Standard Practice for Tunnel Lighting divides the tunnel into 4 major sections: threshold zone, transition zone, interior, and exit zone. The guidance recommends

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relatively bright daytime lighting levels at the tunnel entrance, followed by a stepped reduction in light levels until the recommended interior light level is reached.
Lighting would be accomplished using ceiling-mounted light-emitting diode (LED) luminaires. LED would provide white light more efficiently and with lower maintenance requirements than high pressure sodium. Power to the luminaires would be provided via two circuits: a nighttime circuit that is always on, and a daytime circuit that is photocell controlled.

- Drainage - The drainage system inside the tunnel would consist of a storm drain system and a sub drain system.
- Water & Ice Control System - A water and ice control system would have to be installed behind the tunnel lining to prevent water and ice from draining into the tunnel.
- Tunnel Lining - The tunnel lining would have a perforated drain pipe located behind the tunnel lining to collect water draining from the tunnel walls.
- Headwall Support - The headwalls for portals at each end of the tunnel would require extensive rock bolts and mesh to prevent rock from falling on to the road surface outside of the portals.
- Emergency Systems - Fire alarms and emergency telephones would be placed inside the tunnel.

Developing an accurate estimate of the construction cost of a tunnel is difficult. Numerous variables including rock quality and rock structure (which are currently not known) have a significant influence on the tunnel cost. For this reason, a higher contingency (50% at the planning stage) is needed for tunnel construction. Table 4-2 and Table 4-3 summarizes the cost estimates for construction and maintenance of Alternative 4.

Table 4-2 – Alternative 4 Cost Estimate

Alternative 4	
Construction Estimate	$86,000,000
25%-50% Contingency (Range)	$21,500,000 - $43,000,000
Estimated Construction Total	$107,500,000 - $129,000,000
30% CE, PE, ICAP	$32,300,000 - $38,700,000
Estimated Project Total (Range)	**$139,800,000 - $167,700,000**

Table 4-3 – Alternative 4 Annual Maintenance Cost

Alternative 4 Component	**Estimated Cost**
Tunnel Maintenance	$20,000
Electricity	$40,000
Estimated Annual Costs:	**$60,000**

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4.3 Least Overall Harm Considerations - Alternative 4

Alternative 4 has been evaluated to determine which non-avoidance alternative results in the least overall harm. The following factors were considered. A summary of the Least Overall Harm Analysis is located in Appendix C of the Net Benefit 4(f) form.

Advantages

- Community and Economic Impacts - Alternative 4 would not result in substantial adverse economic impacts or community impacts to adjacent homes, businesses, or other improved properties.

Disadvantages

- Cost and Maintenance Problems - Alternative 4 would result in a substantially increased roadway cost. It would cost between $49,200,000 and $77,000,000 more than the proposed Alternative 2A. The proposed Alternative 2A is estimated to cost $90,700,000. Alternative 4 would cost between $139,800,000 and $167,700,000. There is a great range on the estimated cost and a high risk for cost overruns due to the inherent difficult and unknown nature of tunnel construction. In addition, the annual maintenance cost ($60,000 per year) would be far greater under Alternative 4, (e.g. electrical and emergency requirements associated with a tunnel).
- Transportation Needs, Traffic & Safety Problems - Alternative 4 would not meet the identified transportation needs. This alternative would not include the design improvements needed to substantially improve safety and improve traffic operations. Thus, the elevated high-severity crashes and traffic congestion in the project area would likely continue in accordance with historical trends.
    - Alternative 4 would not provide separation of northbound and southbound traffic.
    - Alternative 4 would not provide new auxiliary lanes for passing and turning to improve ingress/egress or to allow for relief of traffic congestion.
    - Alternative 4 would limit vertical clearance in the tunnel. Building a tunnel large enough to accommodate the infrequent use of permitted oversized loads would be prohibitive. As a result Alternative 4 would require that the existing Seward Highway alignment be maintained as a bypass route for vehicles with large loads creating two intersections on either side of the tunnel as traffic conflict locations.
- Engineering Problems – Alternative 4 results in unique engineering problems.
    - There are inherent engineering difficulties and constructability concerns with tunnel construction. Construction of a tunnel would require drilling and blasting into rock of unknown quality and stability; the required stabilization techniques would be dependent upon the conditions encountered and could likely vary along the tunnel alignment. Design and construction of the tunnel would require lighting and ventilation systems as well as backup power to support these systems in the event of power failure. All of the key design elements listed above would require specialized engineering support beyond what would be required for all other alternatives.
- Environmental and Social Impacts - Alternative 4 would result in substantial adverse environmental and social impacts. Specifically the following impacts would result.
    - Visual Impacts – Moderate visual impacts would occur in terms of newly exposed rock cut face (130,000 sq. yards). Rock cut faces up to 224 feet high and 925 feet long south of tunnel and 345 linear-feet long north of tunnel are needed to construct the portals at either end, which would affect the aesthetics of the highway and CSP. Rock cuts would be visible for motorists for about one mile in each direction. Visual impacts were raised as one of the most concerning impacts during public meetings for this project

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- Wildlife Habitat - Alternative 4 would directly impact approximately 0.75 acres of high value Dall sheep habitat at one of the most popular wildlife viewing areas on the Turnagain Arm. This conflicts with strong public sentiment to avoid impacts to sheep habitat. In addition, the traveling public would be unable to see Dall sheep or other wildlife at Windy Corner since they would bypass the scenic viewing area by way of the tunnel. This is would be a substantial social impact since Windy Corner is one of the most popular wildlife viewing areas along the Turnagain Arm.

- Section 4(f) Benefit - Alternative 4 would result a substantial missed opportunity to benefit a Section 4(f) property
  - Alternative 4 would not include the new mountainside parking facilities with its substantial proposed recreational amenities benefiting CSP (Figure 4 in Attachment A). See the discussion of amenities in the Net Benefit Programmatic 4(f) Evaluation Form, Section IV.2. Prudent and Feasible Evaluation, D.
  - Alternative 4 does not provide an emergency access ramp for water rescue operations.
- Unique Problems - Alternative 4 would result in problems that would be truly unusual or unique, or of extraordinary magnitude when compared with the proposed us of the Section 4(f) property under Alternative 2A. This is true when considering the uncertainties and magnitude of costs related to tunnel construction, the difficulties in meeting the transportation needs, and the impacts to unique resources (scenic views and Dall sheep habitat) of high value to the public.

5.0 ALTERNATIVE COMPARISON SUMMARY

As shown in the table below, the costs of the six alternatives range from $38.3 million up to $167.7 million. Four alternatives (2A, 2B, 2C and 3) meet the project purpose and need to implement safety upgrades and improve traffic operations within the project limits. The table also indicates how far the alignments extend into Turnagain Arm and the varying impacts of where the material required for project is obtained

Table 5-1 – Cost Estimate and Material Options

						Material Excavation Beyond Project Limits			
Alternative Number	Description	Obtains Material From	Project Cost Estimate	Meets Purpose and Need	Extended into Turnagain Arm (feet)	Maximum Cut Height (feet)	Exposed Rock Face (acres)	Visible Northbound (miles)	Visible Northbound (miles)
1	Stay Within ROW	Within Project Limits	$38.3	No	0	NA	13	None	No
2A	Shift into Turnagain Arm	MP 109	$90.6	Yes	435	238*	7*	0.25	1.5
		MP 104				82	2.5	0.9	0.7
2B	Shift into Turnagain Arm	Cut within ROW	$104.5	Yes	435	217	35.5	5.5	5
2C	Shift into Turnagain Arm	Outside CSP	$129.7	Yes	435	0	0	0	0
3	Shift Inland	Within Project Limits	$92.1	Yes	340	300	0	3	2.9
4	Tunnel	N/A	$139.8 to $167.7	No	0	NA	NA	NA	NA

Improvements to CSP and impacts to several high value recreational opportunities within the project area are summarized in the table below. Alternative 2A is the only one of the six that is considered Feasible and Prudent.*

Table 5-2 – Feasible & Prudent Summary

Alternative Number	Obtains Material From	Park Facilities New or Improved	Emergency Access Ramp	TAT Impacts	Sheep Habitat Impact (Acres)	Rock Climbing Routes Impactd	CIBW Habitat Lost (Acres)	Feasible and Prudent
1	Within Project Limits	None	No	None	9.4	13	None	No
2A	MP 109 MP 104	Mountainside Facility & Amenities	Yes	New Connection	2.4	5	26.3	Yes
2B	Cut within ROW	Mountain Side Paved Parking	Yes	New Connection	2.4	56	26.3	Yes
2C	Outside CSP	Mountain Side Paved Parking	Yes	New Connection	2.4	5	26.3	Yes
3	Within Project Limits	Mountain Side Paved Parking	Yes	210 LF	7.4	13	14.9	Yes
4	N/A	None	No	None	3	0	None	No

* 23 CFR 774.17 defines feasible and prudent as follows:
Feasible - An alternative is not feasible if it cannot be built as a matter of sound engineering judgment.
Prudent - An alternative is not prudent if:(i) It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
(ii) It results in unacceptable safety or operational problems;
(iii) After reasonable mitigation, it still causes: (A) Severe social, economic, or environmental impacts; (B) Severe disruption to established communities; (C) Severe disproportionate impacts to minority or low income populations; or (D) Severe impacts to environmental resources protected under other Federal statutes;
(iv) It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
(v) It causes other unique problems or unusual factors; or
(vi) It involves multiple factors in paragraphs (3)(i) through (3)(v) of this definition, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

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ATTACHMENT A

Figures

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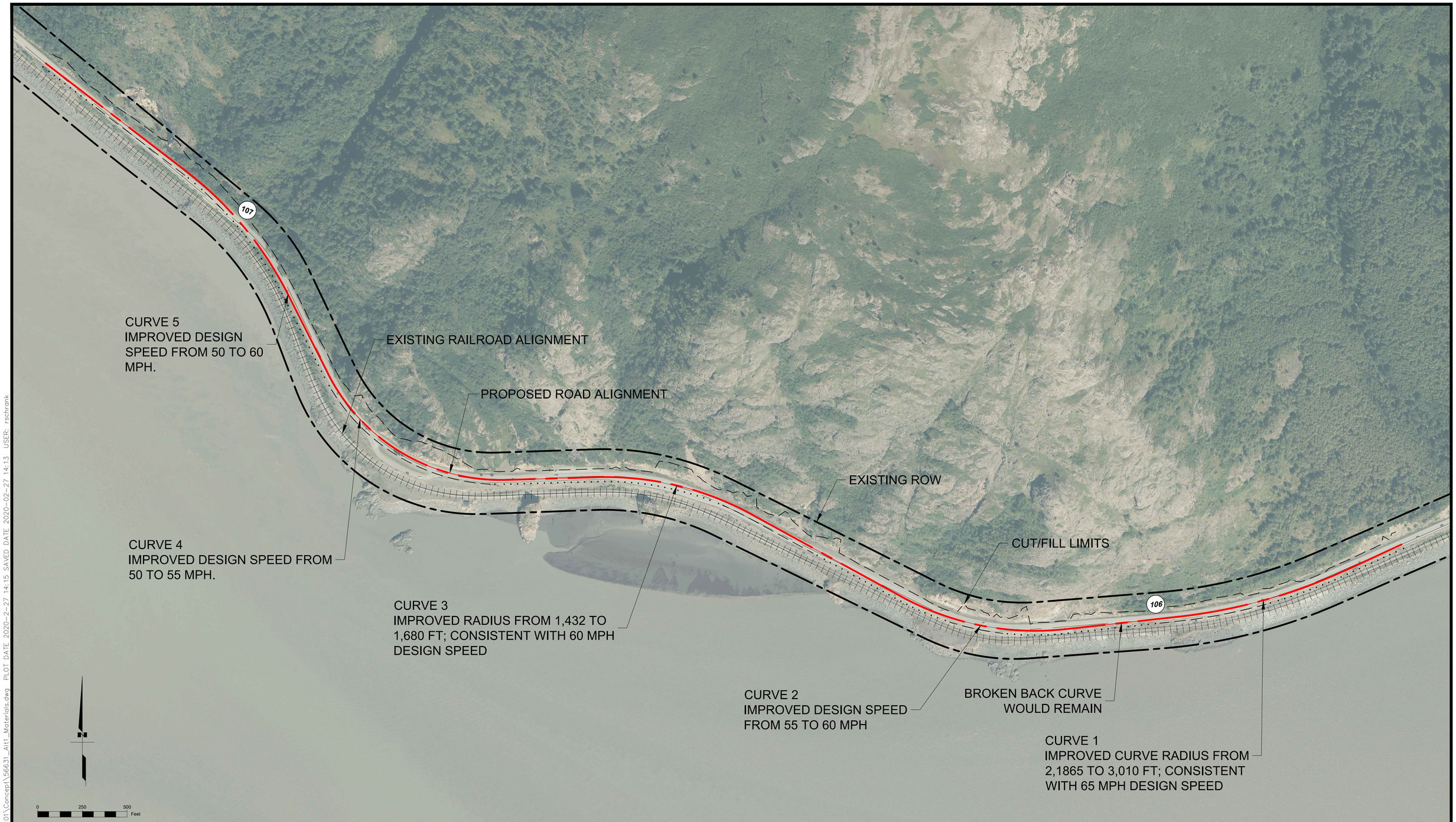

MP MILEPOST

EXISTING RIGHT-OF-WAY

EXISTING SEWARD HIGHWAY CENTERLINE

EXISTING RAILROAD ALIGNMENT

PROPOSED ROADWAY CENTERLINE

PROPOSED CUT LIMITS

PROPOSED FILL LIMITS

WINDY CORNER 105 - 107
ALTERNATIVE 1: STAY WITHIN EXISTING ROW

T10N R2W Sec 2 - 3
Seward Meridian, Alaska

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF Project No. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

February 21, 2020 | FIGURE 1

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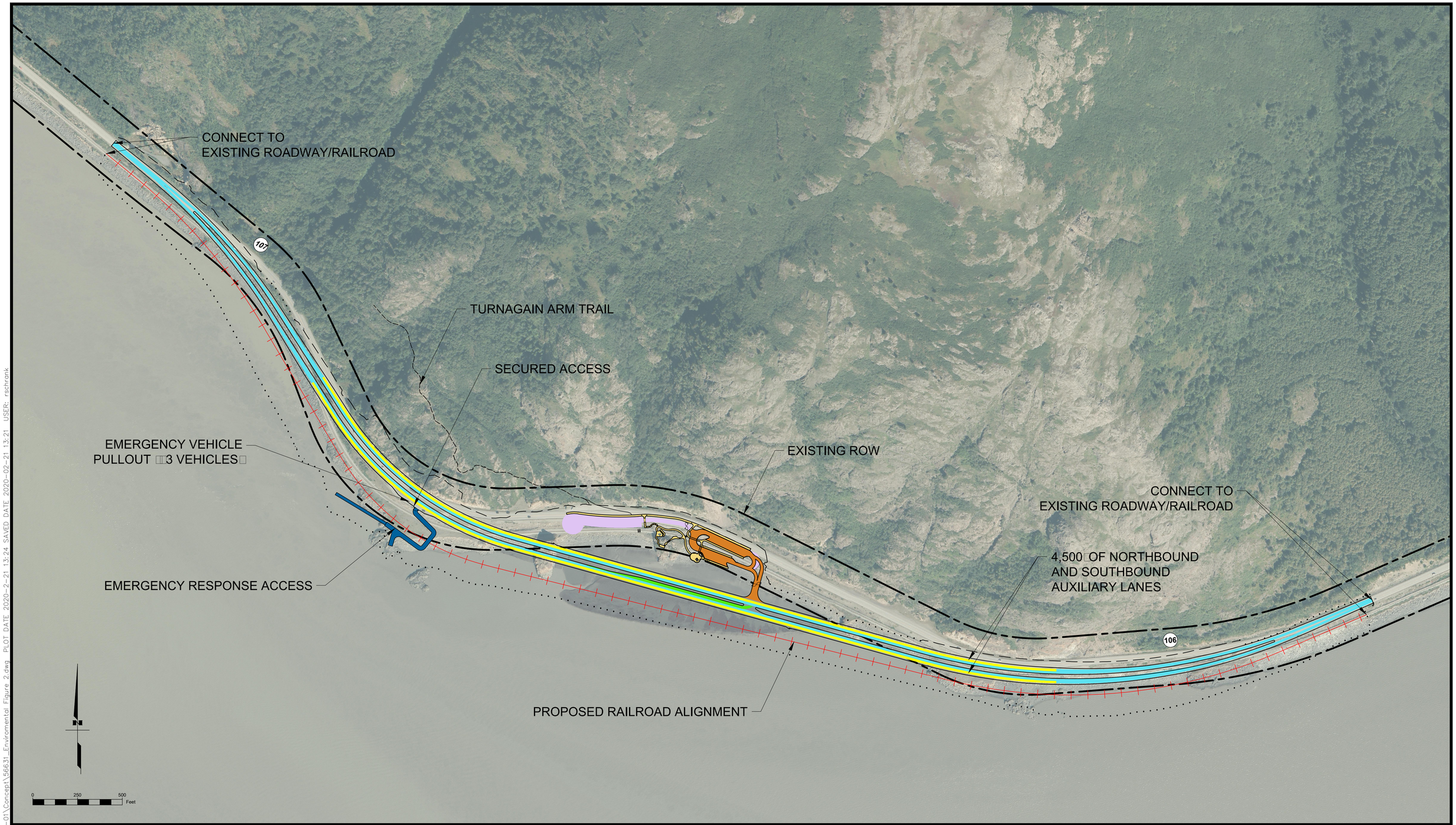

MP MILEPOST
EXISTING RIGHT-OF-WAY
PROPOSED LEFT-TURN LANE
PROPOSED THROUGH LANE
PROPOSED AUXILIARY LANE
PROPOSED PARKING AREA
PROPOSED GRAVEL PARKING AREA
PROPOSED PATHWAYS □ADA ACCESSIBLE□
PROPOSED RAILROAD ALIGNMENT
PROPOSED CUT LIMITS
PROPOSED FILL LIMITS

WINDY CORNER 105 - 107
ALTERNATIVE □A: SHIFT INTO T□RNAGAIN ARM

T10N R2W Sec 2 - 3
Seward Meridian, Alaska

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF Project No. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

February 21, 2020 | FIGURE 2

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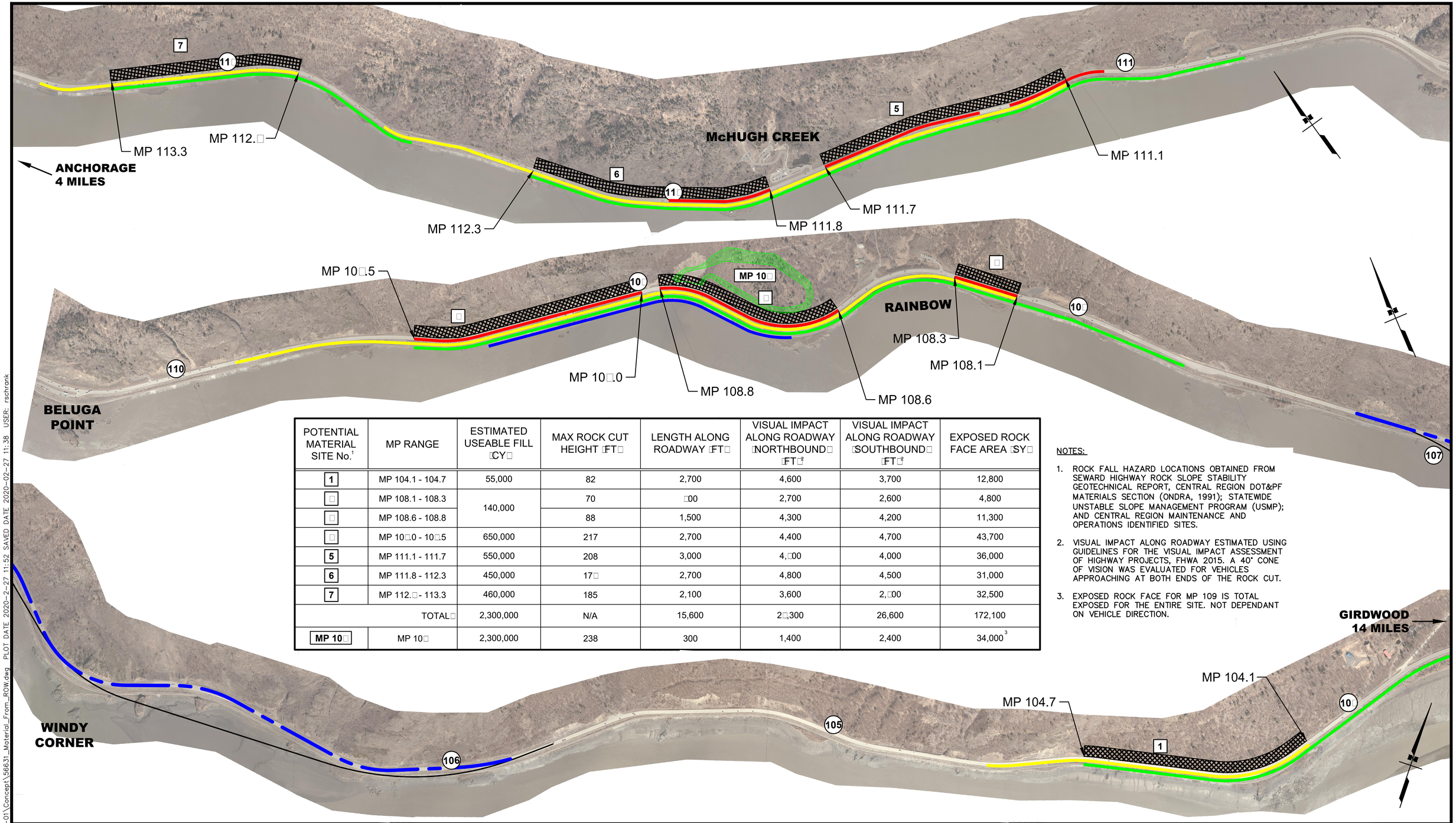

POTENTIAL MATERIAL SITE No.[1]	MP RANGE	ESTIMATED USEABLE FILL (CY)	MAX ROCK CUT HEIGHT (FT)	LENGTH ALONG ROADWAY (FT)	VISUAL IMPACT ALONG ROADWAY (NORTHBOUND) (FT)[2]	VISUAL IMPACT ALONG ROADWAY (SOUTHBOUND) (FT)[2]	EXPOSED ROCK FACE AREA (SY)
1	MP 104.1 - 104.7	55,000	82	2,700	4,600	3,700	12,800
	MP 108.1 - 108.3	140,000	70	00	2,700	2,600	4,800
	MP 108.6 - 108.8		88	1,500	4,300	4,200	11,300
	MP 10.0 - 10.5	650,000	217	2,700	4,400	4,700	43,700
5	MP 111.1 - 111.7	550,000	208	3,000	4,00	4,000	36,000
6	MP 111.8 - 112.3	450,000	17	2,700	4,800	4,500	31,000
7	MP 112. - 113.3	460,000	185	2,100	3,600	2,00	32,500
	TOTAL	2,300,000	N/A	15,600	2,300	26,600	172,100
MP 10	MP 10	2,300,000	238	300	1,400	2,400	34,000[3]

NOTES:

1. ROCK FALL HAZARD LOCATIONS OBTAINED FROM SEWARD HIGHWAY ROCK SLOPE STABILITY GEOTECHNICAL REPORT, CENTRAL REGION DOT&PF MATERIALS SECTION (ONDRA, 1991); STATEWIDE UNSTABLE SLOPE MANAGEMENT PROGRAM (USMP); AND CENTRAL REGION MAINTENANCE AND OPERATIONS IDENTIFIED SITES.
2. VISUAL IMPACT ALONG ROADWAY ESTIMATED USING GUIDELINES FOR THE VISUAL IMPACT ASSESSMENT OF HIGHWAY PROJECTS, FHWA 2015. A 40° CONE OF VISION WAS EVALUATED FOR VEHICLES APPROACHING AT BOTH ENDS OF THE ROCK CUT.
3. EXPOSED ROCK FACE FOR MP 109 IS TOTAL EXPOSED FOR THE ENTIRE SITE. NOT DEPENDANT ON VEHICLE DIRECTION.

MP — MILEPOST

POTENTIAL MATERIAL LOCATIONS

MP 10 MATERIAL LOCATION

WINDY CORNER PROJECT AREA

IDENTIFIED ROCK FALL HAZARD LOCATIONS

VISUAL IMPACT ALONG HIGHWAY (SOUTHBOUND)

VISUAL IMPACT ALONG HIGHWAY (NORTHBOUND)

MP10 VISUAL IMPACT ALONG HIGHWAY

0 500 1000 Feet

WINDY CORNER 105 - 107
ALTERNATIVE : MATERIALS

T10N R1W Sec 6; T10N R2W Sec 1-4;
T11N R2W Sec 30-33; T11N R3W Sec 23, 25-26
Seward Meridian, Alaska

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF Project No. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

February 21, 2020 | FIGURE 3

C:\Civil 3D Projects\2016\24\61278-01\Concept\56631_Material_From_ROW.dwg PLOT DATE 2020-2-27 11:52 SAVED DATE 2020-02-27 11:38 USER: rschronk

CONNECT TO
EXISTING ROADWAY/RAILROAD

TURNAGAIN ARM TRAIL

SECURED ACCESS

EMERGENCY VEHICLE
PULLOUT □3 VEHICLES□

EXISTING ROW

CONNECT TO
EXISTING ROADWAY/RAILROAD

4,500□ OF NORTHBOUND
AND SOUTHBOUND
AUXILIARY LANES

EMERGENCY RESPONSE ACCESS

PAVED PARKING AREA

PROPOSED RAILROAD ALIGNMENT

107

106

N

0 250 500 Feet

MP MILEPOST
EXISTING RIGHT-OF-WAY
PROPOSED LEFT-TURN LANE
PROPOSED THROUGH LANE
PROPOSED AUXILIARY LANE
PROPOSED PAVED PARKING AREA

PROPOSED RAILROAD ALIGNMENT
PROPOSED CUT LIMITS
PROPOSED FILL LIMITS

WINDY CORNER 105 - 107
ALTERNATIVE □□ □□d □C: SHIFT INTO T□RNAGAIN ARM

T10N R2W Sec 2 - 3
Seward Meridian, Alaska

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF Project No. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

February 21, 2020 | FIGURE 4

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CONNECT TO
EXISTING ROADWAY/RAILROAD

TURNAGAIN ARM TRAIL

CUT EXTENDS 204 FEET INTO
CHUGACH STATE PARK

LIMITS OF EXCAVATION WOULD
IMPACT TURNAGAIN ARM TRAIL

EMERGENCY VEHICLE
PULLOUT □3 VEHICLES□

PAVED PARKING AREA

CONNECT TO
EXISTING ROADWAY/RAILROAD

EXISTING ROW

EMERGENCY RESPONSE ACCESS

PROPOSED RAILROAD ALIGNMENT

FILL EXTENDS 310 FEET
INTO THE INLET

107

106

N

0 250 500 Feet

MP MILEPOST

EXISTING RIGHT-OF-WAY

PROPOSED LEFT-TURN LANE

PROPOSED THROUGH LANE

PROPOSED AUXILIARY LANE

PROPOSED PAVED PARKING AREA

PROPOSED RAILROAD ALIGNMENT

PROPOSED CUT LIMITS

PROPOSED FILL LIMITS

WINDY CORNER 105 - 107
ALTERNATIVE □: SHIFT INLAND AT WINDY CORNER

T10N R2W Sec 2 - 3
Seward Meridian, Alaska

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF Project No. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

Marc□ 1, 2020 | FIGURE 5

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MP MILEPOST
EXISTING SEWARD HIGHWAY CENTERLINE
EXISTING RAILROAD ALIGNMENT
EXISTING ROW
PROPOSED ROADWAY CENTERLINE
PROPOSED TUNNEL
PROPOSED CUT LIMITS

ALTERNATIVE □: T□NNEL
WINDY CORNER PRO□ECT

T10N R2W Sec 2 - 3
Seward Meridian, Alaska

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF Project No. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

February 21, 2020 | FIGURE 6

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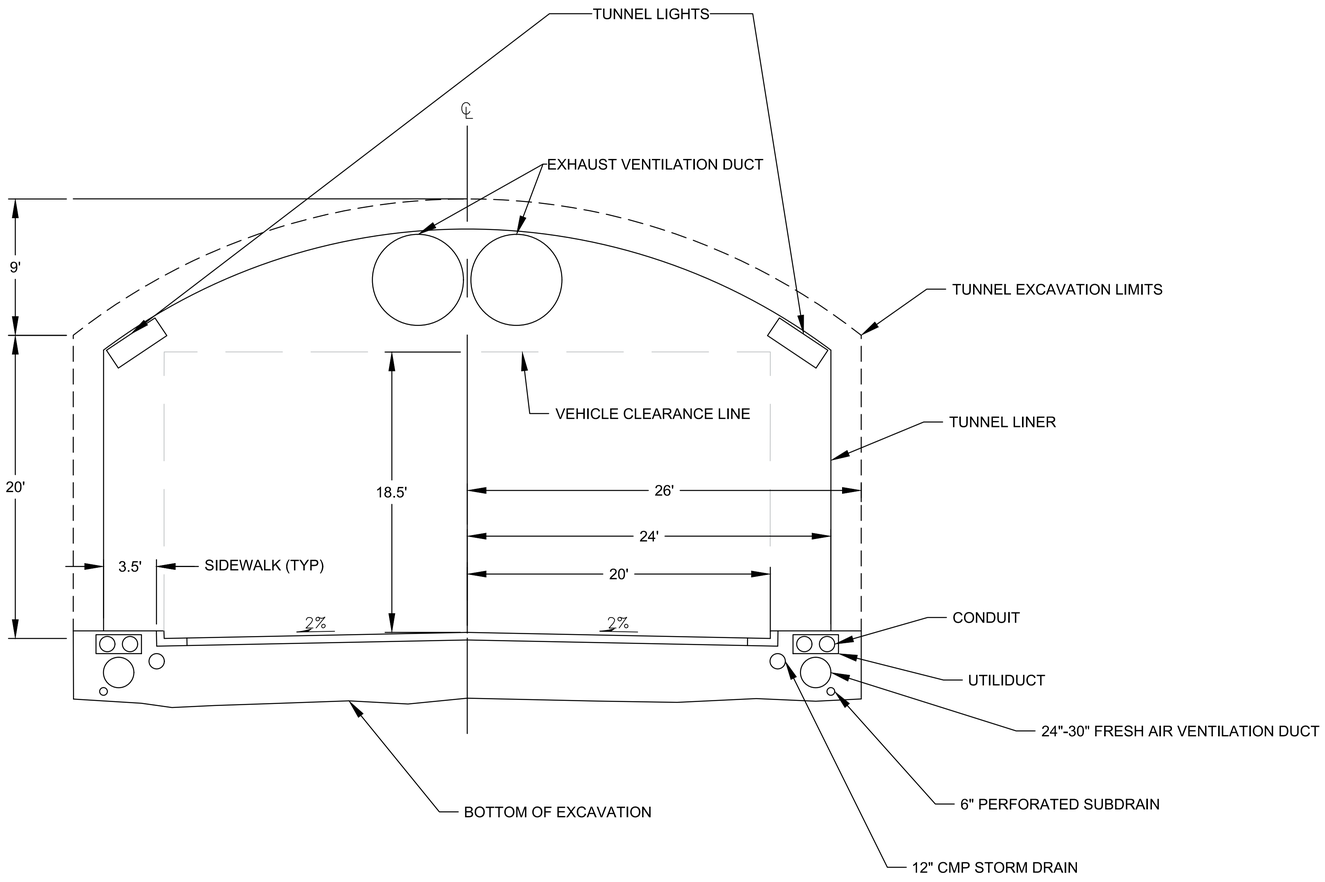

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ALTERNATIVES DEVELOPMENT
ALTERNATIVE □: T□NNEL CROSS-SECTION

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

DOT&PF Project No. 0A31034/Z566310000
SEWARD HIGHWAY: MP 105-107, WINDY CORNER
ANCHORAGE, ALASKA

MUNICIPALITY OF ANCHORAGE, ALASKA

October 17, 201□ | FIGURE 7

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ATTACHMENT B

Material Acquisition and Transportation Cost Analysis

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MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Design and Engineering Services – Central Region
Preliminary Design & Environmental Section

TO: Project File

DATE: June 27, 2017

THRU: Eric Miyashiro, P.E.
PD&E Chief

TELEPHONE NO: (907) 269-0543
FAX NUMBER: (907) 243-6927

FROM: Tom Schmid, P.E.
Project Manager

SUBJECT: Seward Hwy: MP 105-107
Windy Corner Material
Acquisition and Transportation
Cost Analysis

Background

The Department of Transportation and Public Facilities (DOT&PF) published a request for proposal (RFP) on January 24, 2017. The RFP sought construction cost estimating services for material acquisition and transportation as part of the preconstruction effort on the Seward Highway: MP 105-107 Windy Corner project. The intent of the services was to obtain an independent contractor's opinion of probable construction costs for purchasing and transporting approximately 3.9 million tons of materials to project site. Specifically, the DOT&PF requested estimates for a broad spectrum of material sources and haul methods, including:

- A proposed material quarry site that would be permitted within Chugach State Park at MP 109;
- Existing material sources in Anchorage, Eklutna, and Palmer;
- Past material sites near Portage; and
- Material sites near Cook Inlet that could reasonably be barged to the site

The cost analysis findings by material and haul method are attached.

Selected Contractor

The contract was awarded to Granite Construction on March 7, 2017. Granite's qualifications include a number of projects along the Seward Highway corridor including:

- Seward Highway MP 99-100
- Seward Highway Turnouts MP 88
- Seward Highway MP 115-124
- Seward Highway MP 69-75
- Seward Highway MP 104-115

Work along the corridor gives Granite first-hand knowledge of the constraints resulting from traffic and seasonal constrictions.

Other Granite projects with similar challenges to those on Windy Corner include:

- Richardson Highway MP 174-185 – Large earthmoving project with extensive drilling and blasting along with several haul scenarios.
- Anchorage International Airport (AIA) runway 7-25 – Large earthmoving project with many constraints and tight schedule window
- Dalton Highway 260-321 – Remote large earthmoving project with logistical challenges
- Cantwell Hard Aggregate Production – Utilization of train haul for aggregate transport, including development of loadout area to load train cars efficiently
- AIA Runway 14-32 – Large earthmoving project during tight schedule window
- Seward Harbor – Production and placement of riprap and armor stone, large amount of marine placement and logistical support by water
- West Dowling Road – Large earthmoving and material transport project including off road and legal haul units

In addition to Granite's experience, they included Brice Marine, LLC as a subconsultant to provide input and support for the marine cost and logistics analysis. Brice was included given their experience executing marine based operations and infrastructure work. This was of particular importance in accurately evaluating potential barge operations given the extreme tides, currents, and limited work windows in Cook Inlet and Turnagain Arm.

Scope of Work

The scope focused exclusively on the logistics and costs associated with the material acquisition and transportation of materials to the project site. Granite identified specific locations that are currently used as material sites and identified approximate locations where new material sites could potentially be developed.

Granite evaluated delivery methods that could be used to deliver materials to the project site including marine, train, and conventional truck haul. The method evaluated was dependent on a number of factors including location, cost, and available existing infrastructure to support this method. In some cases more than one method of transportation was evaluated. Due to the project requirement that this material be developed from a rock source (not alluvial) evaluations were limited to the following material sources.

Material Sources

Primary Evaluations:

- MP 109 material site: New site located approximately 2.5 miles north of the project. This location was considered for transportation by train and truck.
- Portage Valley: A number of locations have provided materials for previous DOT&PF projects. This location was considered for transportation by train and truck.
- Eklutna: Potential source could be developed in this area that would meet the requirements for this project. This location was considered for transportation by train and truck.
- Granite Cove Quarry (Kodiak, AK): This quarry has been operational in the past and is currently active with an operator. This quarry is located on Kodiak Island and is limited to water access only.

- Diamond Point Quarry (Iliamna Bay, AK): This quarry is a new site and has not been developed or provided materials previously. Located in Iliamna Bay within Cook Inlet this site is tidewater influenced and limited to water access only.

Secondary Evaluations:

- Skookum Quarry: Active quarry site that supplies all types of manufactured rock products located near Chugiak off of the Old Glenn Highway. This location was considered for transportation by truck only. Currently there are not rail lines or spurs adjacent to this source.
- Mat-Su Valley sites: Non-alluvial rock source locations in the Mat-Su Valley are limited and primarily located outside of Palmer or Wasilla. At this distance from the project, train and truck transport cost become prohibitive compared to other identified sources. For this reason, Granite did not provide pricing information for this location.

Notes and Assumptions for Material Sources and Methods of Transportation

As part of the cost analysis, the following notes and assumptions were made.

General

- Costs include only material purchase/development and transportation to the site. No placement cost of materials is included.
- Each location will require drill and shoot excavation to produce material.
- Permits needed for each location and method of delivery would be possible to obtain in a reasonable time window.
- Evaluation did not include assessment of quality or quantity of rock.
- Fuel cost is based on $3.00/gallon (Marine option), $3.50/gallon (Truck option), and no fuel surcharges for the Train option.

Highway (truck)

- Truck hauls will be limited by weight restrictions given the location of material sources are located outside the project limits and require transportation via highway.
- Material will be hauled in side-dump trucks with typical net capacities of 25 ton/load.
- Estimating approximately 150,000 truckloads being transported between the material source and project site.
- Main factor affecting the haul cost is distance between the available source and the project.
- Due to the large number of trucks needed, significant traffic control will be required to manage traffic during the summer months on the Seward Highway.
- It may be necessary to predominately use night shift operations for importing materials to the project.
- This hauling option could result in significant acceleration in the “wear and tear” of the existing pavement.
- As the truck haul distance increases the number of trucks will increase accordingly. As the truck numbers grow, the risk associated with effectively managing the risk (cost, schedule, and safety) also increases significantly.
- Anticipate a season of April to November, with a winter shutdown.

Rail (train)

- Granite discussed availability of air dump cars with Alaska Railroad Corporation (ARRC) and decided to base analysis on running a train consisting of 40 air dump cars.
- Estimated a capacity of 2,500 ton/train, the project will require approximately 1,500 train trips to the site.
- Existing rail siding located near Indian will accommodate a full work train of up to 85 cars.
- A much smaller rail siding located near Rainbow would not be capable of accommodating a project work train without being expanded.
- There are no sidings located at either MP 109 or Windy Corner, which could necessitate the construction of approximately 2,500 linear feet of track siding or require that the train schedule be flexible to work with other mainline rail traffic.
- If a siding is needed to facilitate the work train schedule with other train traffic, then a rough order of magnitude of approximately $240,000/siding is estimated.
- To load a train at the MP 109 quarry location, significant infrastructure will be required to facilitate material hauling.
- Anticipate a season of April to November, with a winter shutdown.

Marine (barge)

- As with other modes of transportation, distance is one of the largest variable factors influencing the overall cost to deliver material to the project site.
- Marine transportation will present significant challenges as this project is located on the Turnagain Arm and experiences substantial tidal swings upwards of 40 feet.
- Likely requires that barges be capable of "going dry" during the offload of the barge at the site given extreme tides at project site.
- Using larger barges (8,000 ton/load) the project will require almost 500 barge loads to be delivered to the site.
- A large cost will be incurred to mobilize and demobilize each season along with decking the barges each season to protect the barge decks while transporting and handling shot rock and large riprap.
- Included the cost for a full-time assist tug onsite at Windy Corner to help the barge in navigation and positioning during arrival and departures.
- Assumed costs associated with development will be borne by the quarry owner and that materials will be purchased based on "market" pricing from the quarry operator rather than the project contractor operating and producing materials and paying a royalty cost on products.
- Offload approaches that could be used at Windy Corner will require a large investment in temporary infrastructure including piling, mooring dolphins, and a sheet pile bulkhead to support almost 500 barge landings over multiple seasons involving huge tidal swings and large ice movement during the winter months.
- Additional cost would include regular maintenance and operational cost of the offload infrastructure during construction of the project.
- The risk associated with a marine operation in Cook Inlet and Turnigan arm carries a significant amount of risk to overall cost and schedule. The estimate is based on ideal conditions and does not take this overall risk into account.
- Anticipate the typical barge season as mid-April to mid-November, with a winter shutdown.

Notes and Assumptions by Option

MP 109 – Truck Haul

- The truck haul from MP 109 to the project location is approximately 2.5 miles.
- In order to maintain an import rate of 800 ton/hr, an average of 10-12 trucks will be needed.

MP 109 – Train Haul

- Estimated the ability to move 6 trains/shift (15,000 ton/shift) to the project from MP 109 during peak operations.
- Traffic control is likely a significant consideration due to the need to transport material across the highway from the borrow source to the track for loading. Since this material is largely shot rock it is not reasonably feasible to convey the materials over/under the highway to load trains.

Portage – Truck Haul

- The truck haul from the Portage area to the project is approximately 28 miles.
- In order to maintain an import rate of 800 ton/hr, an average of 55 trucks will be needed

Portage – Train Haul

- A borrow source near Portage could support a train haul based off of the railroad siding at Portage which is large enough to support a 40 car train.
- Estimate the ability to move 3 trains/shift (7,500 ton/shift) to the project from Portage during peak operations.

Chugiak – Truck Haul

- The truck haul from Chugiak to the project is approximately 40 miles.
- In order to maintain an import rate of 800 ton/hr, an average of 81 trucks will be needed.

Granite Cove – Barge Haul

- Transportation distance one way from Granite Cove to Windy Corner is approximately 270 nm.
- Estimated round trip time is 109 hours for each barge based on distance and anticipated loading/unloading times.
- Assumes one delivery every day and a half at the site (an average of 5,300 ton/day).

Diamond Point – Barge Haul

- Transportation distance one way from Diamond Point to Windy Corner is approximately 170 nautical miles (nm).
- Estimated round trip time is 67 hours for each barge based on distance and anticipated loading/unloading times.
- Assumes one delivery approximately every day (an average of 8,000 ton/day).
- Source will require dredging, piling, bulkhead construction and overall development of the quarry for rock production prior to being able to access with large barges to load material.

Granite's cost estimate associated with the material acquisition and transportation of materials to the project site are shown in the following table. Attachment A provides additional cost breakdown.

TABLE 1 – Summary of Material Acquisition and Transportation Costs

Material Source – Haul Method	Estimated Total Cost
MP 109 – Truck	$24 Million
MP 109 – Train	$31 Million
Portage Valley - Truck	$62 Million
Portage Valley - Train	$62 Million
Eklutna - Train	$50 Million
Chugiak - Truck	$90 Million
Granite Cove - Barge	$110 Million
Diamond Point - Barge	$78 Million

Attachment A

Material Acquisition and Transportation Cost

Breakdown by Material and Haul Method

	Quantity	MP 109		Portage Valley		Eklutna	Chugiak	Granite Cove	Diamond Point
	Tons	Truck	Train	Truck	Train	Train	Truck	Barge	Barge
203(6C) Borrow, Type C (shot rock)	3,316,000	**$5** $16,580,000	**$7** $23,212,000	**$15** $49,740,000	**$15** $49,740,000	**$12** $39,792,000	**$20** $66,320,000	**$25** $82,900,000	**$17** $56,372,000
203(6E) Borrow, Type E	280,000	**$10** $2,800,000	**$11** $3,080,000	**$20** $5,600,000	**$19** $5,320,000	**$16** $4,480,000	**$25** $7,000,000	**$30** $8,400,000	**$21** $5,880,000
301(1) Agg Base Course, D-1	9,900	**$22** $217,800	**$22** $217,800	**$22** $217,800	**$22** $217,800	**$19** $188,100	**$31** $306,900	**$36** $356,400	**$28** $277,200
214(1) Railroad Ballast	12,800	**$34** $435,200	**$34** $435,200	**$34** $435,200	**$34** $435,200	**$26** $332,800	**$43** $550,400	**$48** $614,400	**$40** $512,000
241(1S) Railroad Subballast	17,400	**$34** $591,600	**$34** $591,600	**$34** $591,600	**$34** $591,600	**$26** $452,400	**$43** $748,200	**$48** $835,200	**$40** $696,000
611(2) Riprap, Class 1	134	**$13** $1,742	**$13** $1,742	**$22** $2,948	**$21** $2,814	**$18** $2,412	**$47** $6,298	**$52** $6,968	**$44** $5,896
611(2D) Coastal Riprap, R360 (8" to 23")	121,000	**$13** $1,573,000	**$14** $1,694,000	**$22** $2,662,000	**$22** $2,662,000	**$19** $2,299,000	**$53** $6,413,000	**$58** $7,018,000	**$50** $6,050,000
611(2G) Coastal Armor, R3600 (31" to 44")	146,000	**$13** $1,898,000	**$14** $2,044,000	**$22** $3,212,000	**$22** $3,212,000	**$19** $2,768,160	**$65** $9,490,000	**$70** $10,220,000	**$62** $9,052,000
Estimated Total Cost		**$24,097,342**	**$31,276,342**	**$62,461,548**	**$62,181,414**	**$50,314,872**	**$90,834,798**	**$110,350,968**	**$78,845,096**

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WINDY CORNER SECTION 4(F) – NET BENEFIT

APPENDIX B

LWCF EA FONSI

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United States Department of the Interior

NATIONAL PARK SERVICE
Alaska Region
240 West 5th Avenue
Anchorage, Alaska 99501

Seward Highway Mileposts 105-107, Windy Corner Improvements
A Partial Conversion of Land Subject to Section 6(f)(3)
of the Land and Water Conservation Fund Act, Public Law 108-198
Chugach State Park, Anchorage, Alaska
Environmental Assessment
Finding of No Significant Impact

February 2019

This Finding of No Significant Impact (FONSI) documents the decision of the National Park Service (NPS) to adopt the preferred alternative in the Windy Corner Environmental Assessment. Alternative 2, the Selected Alternative, includes partial conversion at Chugach State Park by transferring Land and Water Conservation Fund (LWCF) 6(f)(3) requirements from 39.56 acres of land that is currently in park use to 14.7 acres of land currently in transportation use that will be redeveloped for park use. There will remain at Chugach State Park more than 430,000 acres to be managed subject to LWCF requirements.

This alternative was evaluated against Alternative 1, No Action. Both alternatives were described and analyzed in the February 2019 "Seward Highway Mileposts 105-107, Windy Corner Improvements: A [Partial] Conversion of Land Subject to Section 6(f)(3) of the Land and Water Conservation Fund Act, Public Law 108-198 Environmental Assessment" (EA). This EA was prepared by the Alaska Department of Transportation (ADOT) on behalf of the Federal Highway Administration (FHWA) and in cooperation with the Alaska Department of Natural Resources (AKDNR) and NPS.

The LWCF Act is now codified at 54 U.S.C. Section 200305(f)(3). The request to adopt the preferred alternative is made to NPS by the AKDNR, who both administers the LWCF program in Alaska on behalf of NPS and owns and manages Chugach State Park. Chugach State Park is located east of Anchorage, Alaska. The replacement parcel is currently part of the Seward Highway right-of-way where it runs through Chugach State Park.

PURPOSE AND NEED

In 1970, the U.S. Department of the Interior (DOI) Bureau of Outdoor Recreation (now the NPS LWCF AKDNR and Local Assistance Program) awarded grant #02-00057 for development of water wells at a number of AKDNR parks, including Chugach. Overall, there have been awarded fifteen LWCF grants for acquisition and development projects at Chugach. The AKDNR accepted the terms of the grant agreements with full knowledge that those terms include maintaining the park for public outdoor recreation purposes unless those responsibilities are otherwise transferred to an alternate location and approved by the Secretary of the DOI as delegated to the NPS. This LWCF program "conversion" process is described more fully in NPS regulations at 36 C.F.R. 59.3.

Seward Highway travels through Chugach State Park, connecting the City of Anchorage to important points of interest to the south, including the City of Soldotna and Kenai Fjords National Park. ADOT has determined that numerous design issues along Seward Highway contribute to significant public safety concerns and has concluded that reconfiguration of this section of road is needed in order to decrease the number of high-severity injury motor vehicle crashes and also to improve traffic flow. The realignment of the highway would be permanent. In order to complete these safety improvements, ADOT has also determined

the need to gather some construction materials onsite. Although the impact in that area of the park will be temporary, it will be in excess of how NPS currently defines "temporary" for the purposes of LWCF. For LWCF purposes, "temporary" is currently defined as 180 days. The impacts at the borrow site area may last up to two years before they are returned to park use.

While the transportation project itself is not subject to NPS review, NPS must approve the request to convert AKDNR LWCF responsibilities from one section of Chugach State Park to the portion of Seward Highway that will be added to Chugach State Park. The areas to be converted from recreation to transportation use are currently valued as open space, mostly mudflat accessible to the public at low tide. The two materials borrow sites are steeply sloping vegetated banks with bedrock outcroppings, also valued as open space but with no developed public access points. The replacement property will be developed with a new scenic overlook taking advantage of views that include Turnagain Arm and the Kenai Mountains. New recreation developments will include vehicle access, parking, and interpretive signage.

The scope of the NPS review is limited to: 1) assessing equivalency between the area proposed for removal from LWCF related public outdoor recreation use restrictions and the proposed replacement properties as further described in 36 C.F.R. 59.3; 2) determining whether the 430,000 acres at Chugach State Park that remain subject to Section 6(f)(3) requirements will constitute a viable outdoor recreation unit; and, 3) determining whether there are any potential significant environmental impacts associated with developing the replacement park for public outdoor recreation use.

ALTERNATIVES CONSIDERED

1. No Action Alternative

NPS does not approve the AKDNR's proposal to convert a portion of Chugach State Park pursuant to the LWCF conversion regulations. This would not prevent ADOT from moving forward with reconstruction of Seward Highway, but it could subject the AKDNR to penalties including freezing grant funding to other agencies within the state of Alaska. It would also prevent the old Seward Highway alignment from being added to the LWCF estate.

2. Proposed Action Alternative (Selected Alternative)

NPS approves the AKDNR's request to convert LWCF requirements from 39.56 acres at Chugach State Park to 14.7 acres that will be added to Chugach State Park. This will result in a net loss of 24.86 acres from the LWCF estate but a net gain of 10.54 acres to the public recreation estate.

SELECTED ALTERNATIVE

The NPS has selected for implementation the Proposed Action Alternative as described in the EA.

Under the selected alternative, 430,000 acres +/- will continue to be managed consistent with LWCF requirements and will continue to provide public outdoor recreation opportunities for park users. The slightly reduced Chugach State Park will continue to include camping, hiking, trails, and open space for the recreating public. A 39.56 acre section of Chugach State Park will be removed from LWCF requirements. This represents approximately 0.0092% of the LWCF acreage at Chugach State Park.

ADOT will develop a 14.7 acre property as a scenic overlook and trail head and then transfer it to AKDNR where it will become part of the acreage administered for LWCF purposes. The 35.4 acre temporary impact area will remain in AKDNR ownership and be restored for public outdoor recreation use, but will be permanently removed from the LWCF estate.

Based on the analysis provided in chapters three and five of the EA, along with a Biological Assessment and other appendices, NPS concludes the environmental impacts of the conversion are as follows:

Land Use and Recreation: The LWCF Act requires replacement property to be equivalent fair market value, location, and recreation usefulness. It does not require there to be no net loss in total LWCF acreage. While this conversion will result in a net loss of LWCF acreage, the net gain to public recreation infrastructure results in an equivalent exchange. The location is almost identical and the fair market equivalency has been established by appraisals that meet Uniform Appraisal Standards for Federal Land Acquisitions. The impact to land use and recreation as a whole (beyond LWCF) is both a net gain in recreation acreage and a net gain in recreation infrastructure.

Circulation and Transportation: Circulation and transportation through Chugach State Park should improve as a result of the ADOT project that is prompting this conversion request. While that project is outside the scope of the NPS NEPA action, approval of the conversion will result in a safe overlook and trailhead, reducing the potential for people to stop their vehicles in unsafe locations in pursuit of recreation purposes.

Site Aesthetics: For the two years that they are in use, the borrow pits have the potential to negatively impact site aesthetics. Given the slope of the terrain, the existing vegetation cover, and the distance between the borrow pits and the two closest trails, it is believed they will not be visible to trail users. If recreation users choose to hike off trail to a point where they can see the borrow pits, it is possible their experience of site aesthetics will be negatively impacted. As the impacts will be temporary in nature and not affecting a developed recreation amenity, adverse impacts are likely to be minor.

Surface Waters, Floodplains, and Wetlands: Although approval of the conversion and development of the replacement site for park purposes will have no effect on water resources (the conversion approval is administrative and the replacement site is currently in road use), the Seward Highway project itself may impact these resources. Although the referenced EA includes some analysis of those potential impacts, assessment of significance lies with FHWA and should be addressed in their decision document.

Plants, Animals, and Federally Listed Species: Although approval of the conversion and development of the replacement site for park purposes will have no effect on plants or animals, federally listed species, or sensitive habitat (the conversion approval is administrative and the replacement site is currently in road use), the Seward Highway project itself may impact these resources. Although this EA includes some analysis of those potential impacts, assessment of significance lies with FHWA and should be addressed in their decision document.

Historic Properties: Although approval of the conversion and development of the replacement site for park purposes will have no effect on properties listed on or eligible for listing on the National Register of Historic Properties (the conversion approval is administrative and the replacement site is currently in road use - the road itself is not an historic property), there is an historic property within the Area of Potential Effect for the Seward Highway Project and impacts have been assessed by ADOT on behalf of FHWA in consultation with the State Historic Preservation Officer (SHPO).

PRELIMINARY ALTERNATIVES AND ACTIONS CONSIDERED BUT DISMISSED

NEPA allows for alternatives to be eliminated from detailed study based on criteria described in 40 CFR 1504.14 (a). In the case of LWCF conversions, NPS has only two options available: 1) approve the conversion if the criteria are met; or, 2) request additional materials of the AKDNR until the criteria for approval are met. This is also described as the no action alternative and the selected alternative as discussed above.

However, ADOT also considered a smaller conversion footprint alternative that would have required them to locate the materials borrow sites outside the park. Had NPS been forwarded the [Smaller] Conversion Alternative as the selected option instead, it could also have been approved. A choice between the Proposed

Action Alternative and the [Smaller] Conversion Alternative is not with the authority of NPS to select but lies solely with AKDNR and ADOT.

WHY THE SELECTED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT EFFECT

After considering the environmental consequences described in the EA, the NPS has determined that the Selected Alternative and its associated actions will not have a significant effect on the quality of the human environment considering the context and intensity of impacts (40 CFR 1508.27). Thus, an environmental impact statement will not be prepared. This finding is based on the following:

• The Selected Alternative will include both beneficial and adverse effects. The Selected Alternative will not have adverse impacts to geological resources, air quality, noise level, water quality/quantity, natural resources such as floodplains, wetlands, and species habitat; land use and planning, circulation such as transportation and accessibility, recreation, aesthetics, historical and cultural resource and socio economic resources, or economic justice for minority and low income populations. The finding of no significant environmental effects is not biased by the beneficial effects of the action.

• The Selected Alternative will not adversely affect public health or safety.

• The Selected Alternative will not result in significant adverse effects to the unique natural resource characteristics of the area, including prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

• The effects on the human environment are known, and there were no controversial impacts or aspects of the proposed project that surfaced during the environmental analysis process. There is no scientific controversy over the impacts of the project.

• The Selected Alternative will have no effect on historic properties. There will be no adverse effect to historic properties within the area of potential effect.

• The Selected Alternative would have no effect on species listed or proposed for listing as endangered or threatened or their critical habitat as determined under the Endangered Species Act of 1973. There are no relevant species or critical habitat in the project area.

• No significant cumulative effects and no highly uncertain, unique or unknown risks were identified during preparation of the EA or during the public review period. The Selected Alternative was evaluated under the standard conversion process criteria in 36 C.F.R. 59.3. Thus, the Selected Alternative neither establishes a precedent for future actions with significant effects nor represents a decision in principle about a future consideration. Conversion proposals are evaluated independently on a case by case basis without reliance on prior decisions.

• The Selected Alternative will not violate federal, state, or local laws or requirements for the protection of the environment.

AGENCY COORDINATION

The public outreach called for by Section 106 of the NHPA was integrated into the NEPA process. Consultation was delegated by FHWA as the lead federal agency to ADOT. The SHPO concurred with a finding of no adverse effect to historic properties in a letter dated February 6, 2015.

This proposal was developed by ADOT on behalf of FHWA in consultation with the AKDNR and the National Park Service, State and Local Assistance Programs.

PUBLIC INVOLVEMENT

The public was invited to participate throughout the scoping process as documented in the "Public Involvement" appendix to the EA. The EA was released for a 30-day public comment period. Substantial comments were addressed by ADOT. Those relevant to NPS review include concerns raised about the potential for aesthetic impacts related to the borrow sites and the equivalency of the replacement land as compared with what is being proposed for conversion.

FINDING

Based on the information provided in the EA and summarized above, the NPS has determined that implementation of the Selected Alternative is not a major federal action and does not require an Environmental Impact statement (EIS). The Selected Alternative will not have a significant effect on the human environment. There are no significant impacts on public health, public safety, or threatened or endangered species. The Selected Alternative will have minor adverse impacts to recreation, which will be mitigated through acquisition and development of the replacement site. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the Selected Alternative is also consistent with 36 C.F.R. 59.3. Therefore, in compliance with the National Environmental Policy Act, an EIS will not be prepared, and the selected project may be implemented immediately.

Recommended by:
Raymond Murray,

Ray Murray 5/13/19

Chief, Partnership Programs — Date
State and Local Assistance Programs
Pacific West Region
National Park Service

Approved:
Bert Frost,

30 May 2019

Regional Director — Date
Alaska Region
National Park Service

WINDY CORNER SECTION 4(F) – NET BENEFIT

APPENDIX C

LEAST OVERALL HARM ANALYSIS

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Section 4(f) Least Overall Harm Analysis [23 CFR 774.3(c)1]

Factor #	Factors in a Least Overall Harm Analysis	Alternative 1	Alternative 2A- Proposed Action (Material from Within CSP)	Alternative 2B (Material from Within R/W)	Alternative 2C (Material from Outside Project)	Alternative 3 (Realign Inland)	Alternative 4 (Tunnel)	No Action
Factors (1-4) Related to Net Harm Caused to 4(f) Property (CSP).								
1	Ability to mitigate adverse impacts to CSP (including benefits to CSP)	Complete Avoidance alternative determined to not be feasible and prudent	HIGH • Provide replacement lands (14.7 acres) 19% greater than the fair market value of the 26.3 acres permanently acquired from CSP • Provide an emergency water rescue ramp. • Provide $2.5 million worth of mountainside park facilities to mitigate for material extraction within the park (CSP). Utilize extracted material for the park improvements. • Leave 35.4 acres of material-extracted lands within CSP in DNR ownership and under 4(f) protection for future park development • Construct a topographic buffer at the primary material location to shield view of rock cuts.	MODERATE • Provide replacement lands (14.7 acres) 19% greater than the fair market value of the 26.3 acres permanently acquired from CSP • Provide an emergency water rescue ramp. • Provide a minimal improved pullout for CSP users.	MODERATE • Provide replacement lands (14.7 acres) 19% greater than the fair market value of the 26.3 acres permanently acquired from CSP • Provide an emergency water rescue ramp. • Provide a minimal improved pullout for CSP users.	MODERATE • Provide replacement lands (7 acres) equal to fair market value of the 14.9 acres acquired from CSP • Provide an emergency water rescue ramp. • Provide a minimal improved pullout for CSP users.	LOW • Provide replacement lands (0.5 acres) that are 42% greater than the fair market value of the 0.75 acres acquired from CSP	Complete Avoidance alternative determined to not be feasible and prudent
2	The relative severity of the remaining 4(f) harm, after mitigation Note: Overall Rankings (High, Moderate, or Low) are based on the greatest impact to an individual resource. These are in **bold** in the bullet list under each alternative		NET BENEFIT • 35.4 acres of temporary 4(f) use will be returned to park use and retain 4(f) protection. • 26.3 acres of park is permanently converted to transportation use and mitigated with re-placement lands as described in #1 above. • After implementation of all mitigation measures listed in #1 above, this is the only alternative that results in a Section 4(f) finding of **Net Benefit** to the CSP	HIGH • 4(f) parklands perm-anently converted to transportation use (26.3 acres) are equal to Alternative 2A. and mitigated with replacement lands as described in #1 above. • **Highest** impact to rock climbing routes. Would result in 5 to 10 times the impact to rock climbing routes as the other non-avoidance alternatives (2A, 2B, 2C, and 3). • **High** construction safety and traffic disruption impacts to CSP users near 7 blasting sites.	HIGH • 4(f) parklands permanently converted to transportation use (26.3 acres) are equal to Alternative 2A. and mitigated with replacement lands as described in #1 above. • **Highest** construction safety and traffic disruption impacts to CSP users of all the alternatives due to extensive truck hauling during construction. Extends construction by one year.	HIGH • 4(f) parklands perm-anently converted to transportation use (14.9 acres) are 43% less than Alt.2A and mitigated with re-placement lands as described in Factor 1 above. • **Highest** impact (7.4 acres) to iconic Dall Sheep habitat compared to (2A,2B, 2C,and 3). Impacts are 208% greater that Alternative 2A. A portion of impacts are within CSP. Dall habitat is of special concern based on agency and public input and attracts substantial wildlife viewers. • **Second highest** impact to rock climbing routes.	LOW • 4(f) parklands permanently converted to transportation use (0.75 acres) are 97% less than Alternative 2A and mitigated with replacement lands as described in #1 above. • **Lowest** impacts to • Park Lands • Climbing routes • Trails • Water Resources compared to the build alternatives meeting project purpose and need (2A,2B,2C, and 3).	
3	The relative significance of each Section 4(f) property		**EQUALLY SIGNIFICANT** The relative significance of Section 4(f) lands to be affected is the same for all these alternatives since the only property for which Section 4(f) applies in the project area is the CSP.					
4	The views of the officials with juris-diction over CSP		**Alternative 2A Net Benefit and Least Overall Harm** The Alaska Department of Natural Resources, the Section 4(f) official with jurisdiction over CSP, has preliminarily concluded that there is no prudent and feasible avoidance alternative to the project's use of the CSP and that Alternative 2A results in the least overall harm of the reasonable range of evaluated alternatives that utilize the CSP.					

Section 4(f) Least Overall Harm Analysis, Continued

Factor #	Factors in a Least Overall Harm Analysis	Alternative 1	Alternative 2A- Proposed Action	Alternative 2B	Alternative 2C	Alternative 3	Alternative 4	No Action
Factors (5-7) Related to Net Harm Cause to Other Non-4(f) Issues – [Transportation Needs, Other Resources, Costs]								
5	The degree to which each alternative meets the purpose and need for the project	Complete avoidance alternative determined not to be feasible and prudent	HIGH Most completely meets the project purpose and need: • Improves roadway geometry • Traffic separation • Auxiliary/Turn Lanes • Large Off-road Parking Area to separate vehicles from proximity to through traffic.	MODERATE Meets purpose and need by providing the same design feature listed for Alternative 2A, except 2B provides a much more minimal area for parking to separate these vehicle from proximity to through traffic.	MODERATE Meets purpose and need by providing the same design feature listed for Alternative 2A, except 2C provides a much more minimal area for parking to separate these vehicle from proximity to through traffic.	MODERATE Meets purpose and need by providing the same design feature listed for Alternative 2A, except 2C provides a much more minimal area for parking to separate these vehicle from proximity to through traffic.	NOT MET Would not meet the transportation purpose and need of the project. • Improves roadway geometry • No traffic separation • No Auxiliary/ Turn Lanes • Restricts Over-sized Vehicles • No Improved Parking Area	Complete Avoidance Alternative determined not to be feasible and prudent
6	After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f) Note: Overall Rankings (High, Moderate, or Low) are based on the greatest impact to an individual resource. These are in **bold** in the bullet list under each alternative.		MODERATE • **Moderate** visual impacts • Not likely to adversely effect Beluga whales • No adverse effect to Andromous Fish or Essential Fish Habitat • Lowest Effect to Dall Sheep Habitat for Build Alternatives • Section 6(f) Finding of No Significant Impact as a result of CSP land conversion Removes up to 35.4 acres of the CSP from 6(f) protection. However these lands will remain as park lands owned by DNR and protected under Section 4(f). • Corps of Engineers accepted plan to preserve wetlands compensate for water impacts • Improved conditions for bicyclists and pedestrians. • Low impact to rock climbing routes • No adverse effect to cultural resources	HIGH Same impacts as noted under 2A except: • **Highest** visual impacts from rock cuts along the Seward. (150% more than Alternative 2A) • **Highest** permanent impact to rock climbing routes. Would result in 5 to 10 times the impact to rock climbing routes as the other non-avoidance alternatives. Both Dall sheep habitat and rock climbing routes are resources of special concern based on public input. • **High** construction safety and traffic disruption near seven roadside blasting sites. Extends construct-ion by one year.	HIGH Same impacts as noted under 2A except: • Lowest visual impacts of all alternatives in terms of newly exposed rock cut face (58% less than 2A). • **Highest** construction safety and traffic disruption impacts motorists of all the alternatives due to extensive truck hauling during construction. Extends construction by one year.	HIGH • **Second highest** visual impacts from rock cuts along the Seward. (63% more than Alternative 2A) • **Second highest** impact to iconic Dall Sheep habitat at 7.4 acres (208% greater that Alternative 2A). Only Alternative 1 is higher at 9.4 acres. Both Visual Setting and Dall Sheep Habitat are resources of special concern based on public input. • **Second highest** impact to rock climbing routes. 160% more than 2A or 2C. • 58% less impact to Turnagain Arm than than 2A, 2B, or 2C.	MODERATE • **Moderate** visual impacts approximately equal to that of Alternative 2A. • Low impacts to: • Water Resources • Wildlife • Park Lands • Trails • Climbing Routes • **High** impacts	
7	Substantial differences in costs among the alternatives		LOW $90.6 million	MODERATE 104.6 million	HIGH $129.7 million	LOW $92.1 million	HIGH $139.8 to 167.7 million	

SUMMARY TABLE OF OVERALL HARM								
Factors in a Least Overall Harm Analysis		Alternative 1	Alternative 2A **LEAST OVERALL HARM ALTERNATIVE***	Alternative 2B	Alternative 2C	Alternative 3	Alternative 4	No Action
1	Ability to Mitigate	Complete Avoidance Alternative determined not to be feasible and prudent	**HIGH**	MODERATE	MODERATE	MODERATE	LOW	Complete Avoidance Alternative determined not to be feasible and prudent
2	Severity of Remaining 4(f) Harm		**NET BENEFIT**	HIGH	HIGH	HIGH	LOW	
3	4(f) Property Significance		EQUALLY SIGNIFICANT - SAME 4(f) PROPERTY AFFECTED (CSP)					
4	Views of Official w/Jurisdiction (OWJ)		Least Overall Harm View	The OWJ's preliminary decision is that these alternatives do not have the Least Overall Harm				
5	Degree Meeting Trans-portation Purpose & Need		**HIGH**	MODERATE	MODERATE	MODERATE	NOT MET	
6	Magnitude of Adverse Impacts to Other Resources		**MODERATE**	HIGH	HIGH	HIGH	**MODERATE**	
7	Cost Differences		**LOW**	MODERATE	HIGH	**LOW**	HIGH	
# of Factors with Least Harm			**7**	1	1	2	2	

***** Darkened cells represent the least harm status for each factor. Alternative 2A has the most factors with least harm. **As a result, DOT&PF concludes that Alternative 2A results in the least overall harm**.

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WINDY CORNER SECTION 4(F) – NET BENEFIT

APPENDIX D

PUBLIC COMMENT & RESPONSE SUMMARY

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WC Net Benefit Section 4(f) Appendix C: Public Comment & Response Summary

Issue	Comment(s)	Team Response
Access to Turnagain Arm	Commenters expressed interest in enhancing access to Turnagain Arm in the project area for both recreational uses (hiking, windsurfing, parasailing, surfing, etc.) and emergency response. Commenters noted the two most dangerous parts of access included: 1) driving the highway and 2) climbing up to get in and out of the water.	The first priority for the project is enhanced safety for Seward Highway road users. In addition, the proposed action includes emergency response access to Turnagain Arm.
Aesthetics, National Scenic Byway, Chugach State Park	Commenters did not want the project to impact the scenic views along the corridor or leave visible scars from material sources. The material source at Bird Point was used as an example.	Constructing improvements to the highway requires scenic intrusions from some combination of excavation of the mountainside and/or fill on the oceanside of the highway/railway. Avoidance, minimization and mitigation measures will be implemented to reduce visual intrusions; however, some visual intrusions are unavoidable. It is estimated that the proposed MP109 material location would be visible from no more than 0.5 miles of the National Scenic Byway's 127-mile length. The proposed MP104 material location, in the unlikely event it becomes necessary, would be visible for approximately 0.7 miles southbound, and partially visible for another 0.9 miles northbound.
Alternate solutions, experimental medians	Try experimental medians on the existing 3 and 4 lane stretches (MP 90-95 and around MP 99-102). Something to keep the cars going opposite directions divided from each other, try it on that stretch for 5 years, see what the statistical results reveal.	Project limits were developed due to the high rate of major and fatal accidents along this portion of the safety corridor. A future Seward Highway Long-Range Transportation Plan may look at innovative solutions and applicability to more areas along the corridor.

Issue	Comment(s)	Team Response
Appraisal value	Commenters questioned the appraisals conducted to determine the value of park lands being converted and replaced by the project.	The property appraisal process is established by the Uniform Appraisal Standards for Federal Land Acquisitions (2016) and is in compliance with Federal regulation 36 CFR 59.3(b)(2) of the LWCF. The appraisal for the LWCF land conversion was prepared by an independent, certified General Real Estate Appraiser, and was reviewed by an independent, certified review appraiser, each licensed in the State of Alaska.
Balancing material site needs with design	Commenter was concerned that the cut and fill balance for the project as it relates to construction material requirements.	Balancing of material within the project corridor was considered during the Alternatives Analysis. The proposed action is expected to require more material than what is available within the project limits.
Climbing area impacts	Members of the rock-climbing community expressed concerns about impacts to the Goat's Head Soup route near mile marker 107.	Eight of the Goat's Head Soup's thirteen climbing routes would remain for use. To mitigate the loss of some routes, the remaining routes would be provided safer and more convenient access by way of the Turnagain Arm Trail, which would have a new trailhead off the new mountainside park facility. The new facility would provide greater parking capacity, safer parking, safer access, and improved facilities for rock climbers. Temporary closures of the Goat's Heat Soup climbing area access for safety are likely during construction. Closures would be minimized.
Communications with public	Commenters praised and criticized the project communications. Some felt the team was doing a good job or keeping stakeholders informed, others felt like the project was changing and they were not being notified of the changes.	The project evolves while going through agency and public review. Due to extensive public comment, the environmental document was changed from a Categorical Exclusion to an EA. The EA details the public outreach to date. The EA also addresses the current build concept.

Issue	Comment(s)	Team Response
Commuters, commuter rail	I also commute every day and want to know if there's any interest in commuter rail.	The Alaska Railroad Corporation continues its efforts to find a funding source for operations because a public transportation system needs operating subsidies. The ARRC has been upgrading track and making changes to make commuter rail feasible in the future.
Cook Inlet Beluga Whale (CIBW) impacts	Public and agency commenters expressed concern for project impacts to beluga whales.	DOT&PF coordinated with resource agencies throughout this process, including the National Marine Fisheries Service (NMFS). As requested by NMFS, a Biological Assessment was conducted for the Cook Inlet beluga whale (CIBW) population, assessing potential impacts to this population and their habitat. NMFS concurred with the finding that the project 'May Affect', but is 'Not Likely to Adversely Affect' the CIBW population. The Biological Assessment is provided on the project website. The NMFS concurrence is provided in Appendix D this EA.
Emergency response access to Turnagain Arm.	Arm Windsurfers have gained pride in being self-sufficient by sailing with partners and carrying signal devices, fins to perform self-rescues or rescue each other. But we also realize that access to enable emergency rescue equipment to put in the water from Windy Point-Gorilla Rock would enhance the capability of the Girdwood or Anchorage Emergency Rescue Departments to meet situations arising from the growing recreational community of windsurfers, kite surfers, standup paddle boarders, kayakers, and bore wave surfers. The only current access points are from the Anchorage Boat Harbor and Twenty Mile River- both of which are tide dependent in their ability to move up or down Turnagain Arm.	The first priority for the project is enhanced safety for Seward Highway road users. In addition, the proposed action includes emergency response access to Turnagain Arm.
Curves	Commenters expressed support for widening the radius of curves in the project area.	Included in proposed action to address safety concerns.

Issue	Comment(s)	Team Response
Design features – sea level rise	Has there been any consideration for sea level rising in the coming years? Particularly the lower-level railroad tracks and the road itself once it's put into place.	The design will consider a 20-year life for the facility.
Funding source(s)	How would the state funding leverage federal dollars as a way to expedite improvements to more of the Seward Highway. One commenter was concerned that the Seward Highway is being improved in a piecemeal fashion.	The project is being developed to allow all sources of funding. Federal and state funding are being utilized. Different funding sources require specific steps that may affect project schedule.
Gorilla Rock access location	Gorilla Rock is one of two primary Turnagain Arm windsurfing spots because of its relative safe access in and out of the water (compared to other locations), the waves that form there against the incoming tide, and because the wind that is concentrated there.	The first priority for the project is enhanced safety for Seward Highway road users. In addition, the proposed action includes emergency response access to Turnagain Arm.
Level of environmental documentation	Early in the process a Categorical Exclusion was identified as the environmental clearance level for the project. Commenters felt this was inadequate for the scale of the project.	As a result of public concerns, further consultation with FHWA led to a class of action determination that an Environmental Assessment be prepared for the project. The FHWA Class of Action can be found on the website.
Lighting	Commenters expressed opposing opinions of lighting in the corridor. Some commenters desired continuous lighting; others preferred current levels of lighting.	Continuous lighting is not being considered for this small segment of the Seward Highway. A future long-range transportation plan for the full Seward Highway corridor is the appropriate place to address corridor lighting.

Issue	Comment(s)	Team Response
Loss of wildlife habitat	Commenters felt that the project will obliterate wildlife habitat and degrade Chugach State Park.	Constructing improvements to the highway requires impacts to CSP. Section 4(f) Evaluation of the Project impacts on CSP has found a net benefit to the park documented in Appendix E, 4f Consultation of the EA.
Maintenance	Commuters indicate the road striping is nonexistent in the presence of blowing snow and dark wet pavement. On wet days it's difficult to find the road.	Maintenance is considered during design development. Maintenance personnel provide review of project documents.
Maintenance, slow vehicle turnouts	Plow slow vehicle turnouts.	The comment will be shared with DOT&PF maintenance personnel.
Material location mitigation	Commenters expressed their belief that blasting done several years ago to create a parking area near Bird Creek is an eye sore. They suggest mitigating the visual impact of blasting with terraces and trees on the terraces. The reforestation process could be hastened my depositing some organic soil on the terraces upon completion of the blasting.	To be considered during preparation of the reclamation plan.
Material locations and reclamation	How will the blasting be done? Consider the aesthetics of the final material site.	Agreements with property owners, contractor best practices, public comment and permit requirements will dictate excavation practices (i.e., blasting) and aesthetics.

Issue	Comment(s)	Team Response
Material site comparisons	Commenters commented about the project material site needs. Commenters felt the project should consider multiple sources for the material needed for the project including those sources outside the project area and also consider different transport options including barging and rail.	In response to early input on material options, DOT&PF commissioned an independent third-party material cost analysis, incorporating different material sources and different modes of material transport for the project. This information from the third-party analysis is included in the 4(f) and is also available on the project website.
Material site locations and selection	Selection of material sites should balance evaluation of impacts and park values.	The selection of material sources within CSP is evaluated and documented in Appendix E, 4f Consultation of the EA.
Minimize the railroad extension out into the water	Commenters who wanted to minimize the railroad extension were concerned about: Loss of sandbar; Minimizing costs; and Minimizing impacts to marine life	The team will consider these impacts while evaluating impacts and developing design concepts for the project.
Natural shoreline, Gorilla Rock	Commenters expressed interest in Gorilla Rock including: Will it be impacted by the project? It had already been blown up by the ARRC? Why spend the money working around it? Part of the natural shoreline should be protected? The project, as currently envisioned, changes the character of the shoreline and preservation of Gorilla Rock doesn't seem economical.	The proposed action will pass through Gorilla Rock.
Non-motorized facilities, bicycle and pedestrians	The Seward highway is a well-used bike corridor between Anchorage and Girdwood. Please include a bike path on the plan. During the summer months there are organized bike rides, usually on the weekends. Consider a bike path easement for future improvements separating cycles from the motorists to enhance safety. In addition, it may stimulate the desire for some to cycle to Anchorage rather than drive, therefore decreasing vehicles on the highway.	The design provides space for a future non-motorized facility. To be considered during design.

Issue	Comment(s)	Team Response
Opposition to the project	Commenters express opposition to the project citing concerns about fiscal responsibility, speeding,	The “No action” alternative would not meet the project’s purpose and need as detailed in the EA.
Parking	Seems like the southbound parking would be more popular than the northbound parking due to tourism from Anchorage. If one lot could be larger, shouldn’t it be the southbound lot?	Considered in design alternatives and park impact mitigation. The southbound parking was removed due to budget and maintenance considerations, and ARRC safety concerns.
Parking at Falls Creek trailhead	What improvements are planned for the Falls Creek trailhead pullout/parking? What happened to the mile 79- area realignment to make ingress/egress to the railroad and the wildlife park safer?	Falls Creek trailhead improvements are not part of proposed project, given the location is beyond the work limits. Ingress/egress safety to the proposed mountainside park facilities at Windy Corner were considered in the proposed action.
Passing lanes	Commenters expressed concern about driver behavior, i.e., speeding in passing lanes.	Construction of auxiliary lanes are included in the proposed action to allow for passing and turning to improve access.
Project cost and funding	Commenters expressed interest in and concern about the funding required for the project and its sources.	The proposed highway improvements between Milepost (MP) 105 and MP107 are proposed to be funded through a combination of Federal and State funds. Seward Highway’s designation as a Safety Corridor elevates the importance of this corridor as a high priority need for Alaska.
Proposed action railroad configuration	The major problem with the proposed action is that the railroad is aligned outside the highway. Since tourist and locals love to stop at Windy Corner, perhaps the railroad should remain where it is (with a slight realignment). This would make it so tourist could walk all along the shoreline and out to the true Windy Point and not cross the railroad tracks, which will obviously occur.	The Alternatives Analysis included an option that did not relocate railroad tracks. The proposed action relocated the railroad tracks.

Issue	Comment(s)	Team Response
Purpose and Need, 'No Action' Alternative	Consider a "No Action" alternative.	The No Action alternative is evaluated in the EA document. A NEPA review requires project effects be compared to a No Action alternative and any other potential Action alternatives carried forward as a type of benchmark for being able to compare effects of various alternatives. The No Action Alternative was found not to meet the project purpose and need.
Railroad design features – embankment slopes	What is the slope on the railroad embankment?	The railroad and highway will be designed to meet current design criteria.
Rainbow community	Rainbow community members expressed a number of concerns about the project including: Scale of project—it is too grandiose Traffic speeds Material site location/extraction Blasting Impacts to wildlife Impacts to residences Length of construction – 1-2 years	The EA addresses the purpose and need (2.1 and 2.2) for the project and the mitigation of impacts to wildlife (5.2.6 Wildlife and Birds) and adjacent residents (5.2.2.2.2 Social Considerations-Proposed Action & Table 16-Construction Impacts-Noise). The 4f document (Appendix E) addresses impacts to the park and private property in the community of Rainbow.
Recreational access to Turnagain Arm under railroad tracks	Comments pertain to the safe water access issue; specifically access up and over the railroad tracks to the water. Consider a reasonable rock slope and rock placement to provide a path to the water.	The first priority for the project is enhanced safety for Seward Highway road users. In addition, the proposed action includes emergency response access to Turnagain Arm.
Roadside facilities	Commenters supported the roadside facilities but also had concerns about the size and scale of them.	Roadside facilities were developed in coordination with DNR and the 2016 Chugach State Park Management Plan.

Issue	Comment(s)	Team Response
Roadway design features – horizontal curves	Commenters wanted to know the current highway curve radius at Windy Corner and what impacts the curve radius.	The existing curve at Windy Corner is approximately 1,000 feet. The design curve for the project is based on factors such as design speed and safety analysis.
Rock slides in the project area	Several rock slides occur in the Windy Corner area (MP 106 mentioned) of the Seward Highway. Consider this during design.	The proposed alignment separates the roadway from the rock cliff.
Safety	Commenters support improved safety along the Seward Highway corridor and this project.	The project focus is safety.
Safety	Commenters stated Alaska State Trooper presence higher factor in highway safety than planned road improvements.	Trooper presence is a factor in highway safety enforcement but considered a short-term solution in a safety corridor. In addition, trooper availability varies depending on funding. Roadway improvements are permanent and considered a long-term solution.
Safety improvement delivery	Commenters were making the improvements into more of a combined effort for the whole Seward Highway and about how to get more funding to speed up the process. Commenters were concerned that the Seward Highway improvements are being approached in a piecemeal fashion.	Project limits were developed due to the high rate of major and fatal accidents along this portion of the safety corridor. A future Seward Highway Long-Range Transportation Plan may look at additional funding sources and safety improvements along the entire corridor.
Safety need – 'old' accident data	Commenters challenged the need for safety improvements based on the data presented in early documents.	The accident rate data was updated to include data from 1977 to 2015.
Scale of project	Commenters felt the project seems to be excessively expansive, intrusive, far larger than needed to enhance public safety.	The scale of the project is a function of improving safety and accommodating existing facilities in the project area owned by DOT&PF, ARRC, and CSP.

Issue	Comment(s)	Team Response
Scenic byway	The corridor was included in the State Scenic Byway system in 1993 and became part of the National Scenic Byway program in 2000. Do not change the aesthetics along the highway.	Constructing roadway improvements through this corridor will have aesthetic impacts. The excavation and reclamation plan for the proposed material location at MP 109 considers the roadway aesthetics and mitigation measures.
Seward Highway corridor projects	Commenters desired information on other projects in the Seward Highway corridor.	Information for other projects along the Seward Highway can be found on the DOT&PF website.
Sheep and terrestrial habitat	Public and agency comments expressed concern regarding impacts to wildlife in the project corridor.	The project team coordinated with resource agencies throughout this process, including Alaska Department of Fish & Game (ADF&G). Dall sheep are not a protected species, however the LWCF Environmental Assessment (EA) recognized that they are an iconic wildlife species in this area and a popular tourist attraction due to their frequent activity in close proximity to the road. DOT&PF has incorporated mitigation measures intended to reduce potential effects to sheep, including 1) aligning the proposed highway corridor further out into Turnagain Arm to avoid impacts to the high-value habitat area and 2) improving the turnouts to enhance the public's ability to safely view the wildlife. Habitat impacts to sheep, moose and other terrestrial fauna resulting from material extraction and road construction are considered in the EA.
Short term project and long term project goals	The project should consider the long-term safety goals/configuration so that a minimum of reconstruction will be necessary in the future.	Project based on a 20-year design life. In addition, space left for ARRC future expansion and mountainside pathway adjacent to the road.
Support for the project	I would like to say how glad I am to see a proposal for a divided highway at Windy Corner. Having lost a family member in a crossover crash near this area, I know what a difference this will make in bad winter weather and in summer for passing/overtired drivers. This will save lives.	Comment appreciated. The project focus is safety. Auxiliary lanes and divided highway are part of the proposed action to mitigate high severity crashes.

Issue	Comment(s)	Team Response
Support for the project	Commenters cited increased safety, wildlife view opportunities, water access and passing lanes as factors in their support of the project.	Comments acknowledged.
Toilet facilities	Commenters stated that having toilet facilities at another location along the Seward Highway would be a huge asset.	Proposed action includes toilet facilities based on coordination with DNR.
Traffic speeds	Commenters felt that the straightened/expanded highway may cause more safety problems due to increased speeds.	The speed limit on the highway will remain the same and the auxiliary lanes will help separate slow sightseeing and turning traffic from faster through traffic. Speed differentials on the current one-lane section contribute to increased crash levels.
Turnagain Arm access facilities	Commenters suggested that a firm, protected gravel bar where a small zodiac or rescue jet ski could be launched from a small trailer pushed by hand to the water and a connecting small path be considered in the design.	The first priority for the project is enhanced safety for Seward Highway road users. In addition, the proposed action includes emergency response access to Turnagain Arm.
Turnagain Arm access for emergency response	Access could be gated for Anchorage or Girdwood Fire Department use only. Commenters introduced the concept of including a semi- improved boat launch as part of the road and railroad realignment associated with the project. The boat launch would be designed for the exclusive use of rescue personnel, not for public use, in order to launch small rescue watercraft and inflatable boats. Use would be coordinated with the Alaska Railroad to authorize and limit access across their tracks.	The first priority for the project is enhanced safety for Seward Highway road users. In addition, the proposed action includes emergency response access to Turnagain Arm.

Issue	Comment(s)	Team Response
Turnagain Arm recreational access disruption	Carrying windsurfing equipment down the embankment to the railroad track, crossing them (with a permit from the ARRC), and then down the riprap to the water's edge is very workable in the present state. Commenter concerned about having workable access upon completion of this project.	The first priority for the project is enhanced safety for Seward Highway road users. In addition, the proposed action includes emergency response access to Turnagain Arm.
Unique flora in project area	Four plants in the project area are officially designated rare by the UAA Alaska Natural Heritage Program—Yellowstone Draba (Draba incerta), Rattlesnake Fern (botrychium virginianum), Licorice Fern (Plypodium sibiricum) and Creeping Juniper (Juniperus horizontalis).	To be considered during design.
Use of State parkland	Commenters opposed use of parkland for the project.	Any Federally-funded, proposed transportation use of State parkland, wildlife refuge, or historic site, is required to undergo a thorough analysis, based on Section 4(f) of the Department of Transportation Act, and in some cases under Section 6(f) of the Land and Water Conservation Fund (LWCF) Act. See Appendices E and F of the EA for detailed evaluations.
Wildlife habitat, Beluga Whales	During periods of rising tide at Windy Point [Windy Corner] a large eddy is created that is used by beluga whales. The southbound lane may be in conflict with this eddy.	Habitat studies are part of the Threatened and Endangered Species Consultation assessing impacts to beluga whales and their habitat. NMFS concurred that the project 'May Affect', but is 'Not Likely to Adversely Affect' the CIBW population. The Biological Assessment is provided on the project website. The NMFS concurrence is provided in Appendix D the EA.