

**EXECUTIVE SUMMARY.....ES-1**

**TABLE OF CONTENTS**

**EXECUTIVE SUMMARY..... 1**

**1.0 INTRODUCTION ..... 1**

**2.0 EXISTING CONDITIONS..... 2**

    2.1 Project Setting ..... 2

    2.2 Seward Highway ..... 3

    2.3 Traffic ..... 5

    2.4 Parking and Pedestrian Facilities ..... 6

    2.5 Emergency Response Access ..... 7

    2.6 Alaska Railroad Corporation ..... 7

    2.7 Chugach State Park ..... 8

    2.8 Cook Inlet ..... 9

    2.9 Turnagain Arm..... 9

    2.10 Material Sources ..... 9

**3.0 PURPOSE AND NEED..... 11**

    3.1 Project Purpose..... 11

    3.2 Project Need..... 11

**3.2.1** Important Transportation Route (Contributing to need for Safety Upgrades and Traffic Operation Improvements) ..... 11

**3.2.2** High-Severity Crashes (Generating Need for Safety Upgrades) ..... 12

**3.2.3** Traffic Congestion (Generating Need for Traffic Operation Improvements)..... 13

    3.3 Logical Termini..... 13

**3.3.1** Unique Combination of Conditions ..... 13

**3.3.2** Termini Rationale..... 14

**4.0 ALTERNATIVES ..... 17**

    4.1 Introduction..... 17

    4.2 Build Alternative Considered and Not Advanced (Alternatives 1 and 4) ..... 19

**4.2.1 Alternative 1 Improvements Within the Existing ROW** ..... 19

            4.2.1.1 Benefits..... 21

            4.2.1.2 Disadvantages..... 21

            4.2.1.3 Alternative 1 Not Advanced ..... 22

**4.2.2 Alternative 4 - Tunnel Under Windy Corner** ..... 23

            4.2.2.1 Benefits..... 23

            4.2.2.2 Disadvantages..... 25

            4.2.2.3 Alternative 4 Not Advanced ..... 25

    4.3 Alternatives Considered and Advanced (No Action, 2A, 2B, 2C, and 3)..... 26

**4.3.1 No Action** ..... 26

            4.3.1.1 Alternative Description..... 26

            4.3.1.2 Purpose and Need Analysis ..... 26

**4.3.2 Alternative 2A Construct Proposed Improvements with Material MP 109 and MP 104 Material Locations** ..... 26

            4.3.2.1 Alternative Description..... 26

            4.3.2.2 Purpose & Need Analysis..... 31

<b>4.3.3</b>	<b>Alternative 2B Construct Proposed Improvements with Material from the Seward Highway ROW</b> .....	33
4.3.3.1	Alternative Description.....	33
4.3.3.2	Purpose and Need Analysis .....	34
<b>4.3.4</b>	<b>Alternative 2C Construct Proposed Improvements with Material from a Distant Source</b> .....	36
4.3.4.1	Alternative Description.....	36
4.3.4.2	Purpose and Need Analysis .....	36
<b>4.3.5</b>	<b>Alternative 3 Shift Proposed Alignment Inland at Windy Corner</b> .....	38
4.3.5.1	Alternative Description.....	38
4.3.5.2	Purpose and Need Analysis .....	38
<b>5.0</b>	<b>ENVIRONMENTAL CONSEQUENCES</b> .....	<b>41</b>
5.1	Environmental Impact Categories Not Affected .....	41
<b>5.1.1</b>	Economic Considerations .....	41
<b>5.1.2</b>	Wetlands .....	42
<b>5.1.3</b>	Alaska Coastal Management Program .....	42
<b>5.1.4</b>	Contaminated Sites .....	42
<b>5.1.5</b>	Air Quality .....	42
<b>5.1.6</b>	Floodplains .....	42
<b>5.1.7</b>	Traffic Noise.....	43
<b>5.1.8</b>	Farmland.....	43
<b>5.1.9</b>	Title VI & Environmental Justice .....	43
<b>5.1.10</b>	Wild & Scenic Rivers and Wilderness Areas .....	43
5.2	Environmental Impact Categories Affected .....	44
<b>5.2.1</b>	Right-of-Way .....	47
5.2.1.1	Affected Environment .....	47
5.2.1.2	Environmental Consequences .....	47
5.2.1.2.1	No Action .....	47
5.2.1.2.2	Alternative 2A .....	47
5.2.1.2.3	Alternative 2B .....	47
5.2.1.2.4	Alternative 2C .....	47
5.2.1.2.5	Alternative 3.....	49
<b>5.2.2</b>	Social Considerations .....	49
5.2.2.1	Affected Environment .....	49
5.2.2.1.1	Neighborhoods and Community Cohesion .....	49
5.2.2.1.2	Recreational Resources .....	49
5.2.2.1.3	Community Facilities .....	49
5.2.2.1.4	Travel Patterns .....	50
5.2.2.1.5	Public Safety.....	50
5.2.2.2	Environmental Consequences .....	50
5.2.2.2.1	No Action .....	50
5.2.2.2.2	Alternative 2A .....	50
5.2.2.2.3	Alternative 2B .....	51
5.2.2.2.4	Alternative 2C .....	51
5.2.2.2.5	Alternative 3.....	52
<b>5.2.3</b>	Local Land Use and Transportation Plans.....	52
5.2.3.1	Affected Environment .....	52
5.2.3.1.1	Land Use Plans .....	53
5.2.3.1.2	Transportation Plans .....	54
5.2.3.2	Environmental Consequences .....	55
5.2.3.2.1	No Action .....	55
5.2.3.2.2	Alternative 2A .....	55

	5.2.3.2.3	Alternative 2B .....	55
	5.2.3.2.4	Alternative 2C .....	56
	5.2.3.2.5	Alternative 3.....	57
<b>5.2.4</b>		<b>Cultural Resources .....</b>	<b>57</b>
	5.2.4.1	Affected Environment .....	57
	5.2.4.2	Environmental Consequences .....	58
	5.2.4.2.1	No Action .....	58
	5.2.4.2.2	Alternative 2A .....	58
	5.2.4.2.3	Alternative 2B .....	58
	5.2.4.2.4	Alternative 2C .....	58
	5.2.4.2.5	Alternative 3.....	58
<b>5.2.5</b>		<b>Anadromous or Resident Fish and Essential Fish Habitat .....</b>	<b>59</b>
	5.2.5.1	Affected Environment .....	59
	5.2.5.2	Environmental Consequences .....	60
	5.2.5.2.1	No Action .....	60
	5.2.5.2.2	Alternative 2A .....	60
	5.2.5.2.3	Alternative 2B .....	60
	5.2.5.2.4	Alternative 2C .....	60
	5.2.5.2.5	Alternative 3.....	60
<b>5.2.6</b>		<b>Wildlife and Birds .....</b>	<b>61</b>
	5.2.6.1	Affected Environment .....	61
	5.2.6.1.1	Habitat .....	61
	5.2.6.1.2	Wildlife .....	61
	5.2.6.1.3	Migratory Birds .....	61
	5.2.6.2	Environmental Consequences .....	62
	5.2.6.2.1	No Action .....	62
	5.2.6.2.2	Alternative 2A .....	62
	5.2.6.2.3	Alternative 2B .....	63
	5.2.6.2.4	Alternative 2C .....	63
	5.2.6.2.5	Alternative 3.....	64
<b>5.2.7</b>		<b>Threatened and Endangered Species .....</b>	<b>64</b>
	5.2.7.1	Affected Environment .....	64
	5.2.7.2	Environmental Consequences .....	65
	5.2.7.2.1	No Action .....	65
	5.2.7.2.2	Alternative 2A .....	65
	5.2.7.2.3	Alternative 2B .....	66
	5.2.7.2.4	Alternative 2C .....	66
	5.2.7.2.5	Alternative 3.....	66
<b>5.2.8</b>		<b>Waterbody Involvement and Water Quality .....</b>	<b>67</b>
	5.2.8.1	Affected Environment .....	67
	5.2.8.2	Environmental Consequences .....	67
	5.2.8.2.1	No Action .....	67
	5.2.8.2.2	Alternative 2A .....	67
	5.2.8.2.3	Alternative 2B .....	68
	5.2.8.2.4	Alternative 2C .....	69
	5.2.8.2.5	Alternative 3.....	69
<b>5.2.9</b>		<b>Vegetation and Invasive Species.....</b>	<b>70</b>
	5.2.9.1	Affected Environment .....	70
	5.2.9.1.1	Vegetation .....	70
	5.2.9.1.2	Invasive Plant Species .....	70
	5.2.9.2	Environmental Consequences .....	71
	5.2.9.2.1	No Action .....	71
	5.2.9.2.2	Alternative 2A .....	71
	5.2.9.2.3	Alternative 2B .....	72
	5.2.9.2.4	Alternative 2C .....	72

	5.2.9.2.5	Alternative 3.....	72
<b>5.2.10</b>		Bicycle and Pedestrian Issues.....	73
	5.2.10.1	Affected Environment.....	73
	5.2.10.2	Environmental Consequences .....	73
		5.2.10.2.1 No Action.....	73
		5.2.10.2.2 Alternative 2A.....	73
		5.2.10.2.3 Alternative 2B.....	74
		5.2.10.2.4 Alternative 2C.....	74
		5.2.10.2.5 Alternative 3.....	74
<b>5.2.11</b>		Section 4(f) .....	75
	5.2.11.1	Affected Environment.....	75
		5.2.11.1.1 Undeveloped Lands (CSP).....	75
		5.2.11.1.2 Turnagain Arm Intertidal Mudflats (CSP) .....	76
		5.2.11.1.3 Dall Sheep Viewing (CSP) .....	76
		5.2.11.1.4 Pullouts (CSP).....	76
		5.2.11.1.5 Trails (CSP).....	76
		5.2.11.1.6 Rock Climbing (CSP) .....	76
		5.2.11.1.7 Water Activities (CSP).....	78
		5.2.11.1.8 Alaska Railroad .....	78
	5.2.11.2	Environmental Consequences .....	78
		5.2.11.2.1 No Action.....	78
		5.2.11.2.2 Alternative 2A.....	78
		5.2.11.2.3 Alternative 2B.....	80
		5.2.11.2.4 Alternative 2C.....	82
		5.2.11.2.5 Alternative 3.....	83
<b>5.2.12</b>		Section 6(f) .....	85
	5.2.12.1	Affected Environment.....	85
	5.2.12.2	Environmental Consequences .....	86
		5.2.12.2.1 No Action.....	86
		5.2.12.2.2 Alternative 2A.....	86
		5.2.12.2.3 Alternative 2B.....	86
		5.2.12.2.4 Alternative 2C.....	88
		5.2.12.2.5 Alternative 3.....	88
<b>5.2.13</b>		Visual Effects and Aesthetics .....	88
	5.2.13.1	Affected Environment.....	88
	5.2.13.2	Environmental Consequences .....	89
		5.2.13.2.1 No Action.....	89
		5.2.13.2.2 Alternative 2A.....	90
		5.2.13.2.3 Alternative 2B.....	91
		5.2.13.2.4 Alternative 2C.....	92
		5.2.13.2.5 Alternative 3.....	93
<b>5.2.14</b>		Irreversible and Irrecoverable Commitment of Resources .....	93
	5.2.14.1	Affected Environment.....	93
	5.2.14.2	Environmental Consequences .....	93
		5.2.14.2.1 No Action.....	93
		5.2.14.2.2 Alternative 2A.....	93
		5.2.14.2.3 Alternative 2B.....	94
		5.2.14.2.4 Alternative 2C.....	94
		5.2.14.2.5 Alternative 3.....	94
<b>6.0</b>		<b>CONSTRUCTION IMPACTS.....</b>	<b>96</b>
	6.1	Affected Environment.....	96
	6.2	Environmental Consequences .....	96
	<b>6.2.1</b>	No Action .....	96
	<b>6.2.2</b>	Alternative 2A .....	96

6.2.3	Alternative 2B .....	98
6.2.4	Alternative 2C .....	100
6.2.5	Alternative 3.....	105
<b>7.0</b>	<b>PREFERRED ALTERNATIVE.....</b>	<b>108</b>
7.1	Decision Factors.....	108
7.2	Alternative 2A (Preferred Alternative).....	113
7.3	Alternatives Not Proposed.....	113
7.3.1	Alternative 2B Not Proposed .....	113
7.3.2	Alternative 2C Not Proposed .....	114
7.3.3	Alternative 3 Not Proposed.....	117
<b>8.0</b>	<b>PERMITS AND AUTHORIZATIONS .....</b>	<b>118</b>
<b>9.0</b>	<b>CUMULATIVE IMPACTS .....</b>	<b>119</b>
9.1	Method for Determining Cumulative Impacts .....	119
9.1.1	Past Actions.....	119
9.1.2	Present Actions.....	120
9.1.3	Reasonably Foreseeable Future Actions.....	120
9.1.4	Resources Assessed for Cumulative Impacts .....	120
9.1.4.1	Aesthetic Effects.....	120
9.1.4.2	Threatened and Endangered Species.....	120
9.1.4.3	Social Considerations.....	121
<b>10.0</b>	<b>PUBLIC INVOLVEMENT AND AGENCY COORDINATION.....</b>	<b>122</b>
<b>11.0</b>	<b>ENVIRONMENTAL COMMITMENTS SUMMARY .....</b>	<b>125</b>
<b>12.0</b>	<b>LIST OF PREPARERS.....</b>	<b>131</b>
<b>13.0</b>	<b>REFERENCES .....</b>	<b>132</b>

## FIGURES

Figure 1: Project Location .....	1
Figure 2: Proposed Project Area.....	2
Figure 3: Existing Typical Section.....	4
Figure 4: Existing Parking and Pedestrian Facilities in Vicinity of Windy Corner.....	6
Figure 5: Seward Highway Fatal & Major Injury Crashes, 1977 to 2015 (DOT&PF 2018b) .....	12
Figure 6: Straight Stretch Approach to Northern Terminus Curve .....	16
Figure 7: Alternative 1- Stay Within Existing ROW .....	20
Figure 8: Alternative 4 – Tunnel.....	24
Figure 9: Alternative 2A - Shift Into Turnagain Arm .....	27
Figure 10: Alternative 2A - Typical Section.....	28
Figure 11: Proposed Emergency Response Access Ramp.....	29
Figure 12: Proposed Material Locations in Relation to Proposed Improvements .....	30
Figure 13: Proposed Mountainside Park Facilities - Cross-Section.....	30
Figure 14: Alternative 2A - Proposed Mountainside Park Facilities .....	32
Figure 15: Alternative 2B - Shift Into Turnagain Arm .....	35
Figure 16: Alternative 2C - Shift Into Turnagain Arm.....	37
Figure 17: Alternative 3 - Shift Inland at Windy Corner.....	39
Figure 18: Proposed Acquisition and ROW Changes.....	48
Figure 19: Anadromous Fish Habitat in Project Area.....	59
Figure 20: Cook Inlet Beluga Whale Critical Habitat (NMFS 2011) .....	65
Figure 21: Goat’s Head Soup Climbing Ridge and Routes.....	77
Figure 22: MP 109 Material Location Plan View and Cross-Section .....	80
Figure 23: Section 6(f) Lands Near Windy Corner.....	85
Figure 24: Alternative 2A - ROW or Easement - Acquisition and Relinquishment.....	87
Figure 25: Visual Simulation of Proposed MP 109 Material Location - Traveling Southbound.....	91
Figure 26: Visual Simulation of Proposed MP 104 Material Location .....	92

## TABLES

Table ES-1: Preferred Alternative Summary of Environmental Consequences.....	ES-6
Table 1: Build Alternatives Considered.....	18
Table 2: Alternative1 Design Speed for Proposed Curve Improvements.....	19
Table 3: Affected Environmental Impact Categories.....	418
Table 4: Environmental Effects and Mitigation Summary .....	44
Table 5: Visual Effects Within Project Limits.....	46
Table 6: Visual Effects at Material Locations .....	46
Table 7: Visual Effects Combined (Within Project Limits and at Material Locations).....	46
Table 8: Chugach State Park Management Plan Facility Recommendations .....	53
Table 9: Chugach Access Plan Management Goals within Project Area (DNR-DPOR 2010).....	54
Table 10: Migratory Birds of Conservation Concern Occurring Near the Project Area.....	62
Table 11: Invasive, Nonnative Plant Species Observed within or Adjacent to the Project Area.....	71
Table 12: Comparison of Preferred Alternative Decision Factors .....	109
Table 13: Detailed Preferred Alternative Decision Factors .....	110
Table 14: Permits and Authorizations Required for Preferred Alternative .....	118

## PHOTOGRAPHS

Photograph 1: View Southeast from Windy Corner above Seward Highway .....	2
Photograph 2: Seward Highway near MP 106.7 .....	3
Photograph 3: Dall Sheep Near Windy Corner .....	3
Photograph 4: Windy Corner Trailhead for Turnagain Arm Trail .....	4
Photograph 5: Seward Highway Summer Traffic at Windy Corner .....	5
Photograph 6: Wildlife Viewers on Highway Shoulder at Windy Corner with Traffic.....	6
Photograph 7: Alaska Railroad Track along Turnagain Arm.....	8
Photograph 8: Wildlife Viewers on Highway Shoulder.....	14
Photograph 9: Southbound Approach to Northern Terminus Curve .....	15
Photograph 10: Seward Highway - No Current Traffic Separation .....	33
Photograph 11: Seward Highway MP 113 - Former Construction Rock Cut Face .....	89
Photograph 12: Seward Highway MP 111 - Former Construction Rock Cut Face .....	90

## APPENDICES

Appendix A: 2001 Memorandum of Agreement
Appendix B: Traffic Noise Analysis
Appendix C: Cultural Resource Consultation
Appendix D: Threatened and Endangered Species Consultation
Appendix E: Section 4(f) Consultation
Appendix F: Section 6(f) Consultation
Appendix G: Agency and Public Comments and Coordination

## ACRONYMS

ADCM	Anchorage Debit-Credit Methodology
AADT	Annual Average Daily Traffic
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
APDES	Alaska Pollutant Discharge Elimination System
APE	area of potential effect
ARRC	Alaska Railroad Corporation
BA	Biological Assessment
BMPs	Best Management Practices
CAP	Chugach Access Plan
CFR	Code of Federal Regulations
CGP	Construction General Permit
CIBW	Cook Inlet beluga whale
CPP	Corridor Partnership Plan
CSP	Chugach State Park
CWA	Clean Water Act
CZMA	Coast Zone Management Act
DNR	Alaska Department of Natural Resources
DNR-DPOR	Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation
DOI	Department of Interior
DOT&PF	Department of Transportation & Public Facilities
EA	Environmental Assessment
EFH	Essential Fish Habitat
E.O.	Executive Order
ESCP	Erosion and Sediment Control Plan
High severity	fatal and major injury
HSIP	Highway Safety Improvement Program
FHWA	Federal Highway Administration
LOS	Level of Service
LWCF	Land and Water Conservation Funds
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
MP	Milepost
mph	miles per hour
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRHP	National Register of Historic Places
Project Area	Windy Corner Project
ROW	Right-of-Way
SHPO	State Historic Preservation Officer
SWPPP	Stormwater Pollution Prevention Plan
U.S.	United States
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service