



APPENDIX G

VISUAL RESOURCES TECHNICAL REPORT

JUNEAU ACCESS IMPROVEMENTS SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT

**STATE PROJECT NUMBER: 71100
FEDERAL PROJECT NUMBER: STP-000S (131)**

Prepared for
Alaska Department of Transportation and Public Facilities
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ATTACHMENT

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ACRONYMS AND ABBREVIATIONS

AMHS	Alaska Marine Highway System
DEMs	digital elevation models
EIS	Environmental Impact Statement
EVC	Existing Visual Condition
FVF	fast vehicle ferry
GIS	geographic information system
IPM	Impact Prediction Model
NEPA	National Environmental Policy Act
SDEIS	Supplemental Draft Environmental Impact Statement
TLMP	Tongass National Forest Land and Resource Management Plan
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VAC	Visual Absorption Capability
VMS	Visual Management System
VSOI	Visual Sphere of Influence
VQO	Visual Quality Objective

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EXECUTIVE SUMMARY

Introduction

The alteration of the existing landscape setting resulting from a highway on the alignments of Alternatives 2 through 2C, 3, 4B, and 4D, as well as ferry terminals for all alternatives, could potentially result in long-term adverse impacts on visual quality and on existing views. Both Forest Service and non-forest areas that may be traversed or are adjacent to the highway that are particularly sensitive and susceptible to modifications within a predominantly unmodified existing natural setting include the following:

- Recreation areas and travel routes (e.g., Alaska Marine Highway System [AMHS], a National Scenic Byway)
- Residential areas (e.g., Haines, Skagway)
- Congressionally designated special management areas and other visually sensitive designated land use areas (e.g., Endicott River Wilderness)
- Landscapes retaining high visual quality (e.g., Berners Bay)
- Cultural resource sites (e.g., Skagway Historic District)

The Forest Service Visual Management System (VMS) was utilized as the basis for the visual resources assessment. The VMS was implemented in an effort to maintain consistency with the *Visual Impact Assessment Report*, Juneau Access Improvements Project (dated May 1997) as well as to determine compatibility with the *Tongass National Forest Land and Resource Management Plan* (TLMP) related to the analysis of effects on visual resources when compared to adopted visual quality objectives (VQOs). Visual resources along the alternatives for the Juneau Access Improvements Project were considered within a specific geographic area to determine potential impacts on viewers and landscape visual quality.

The following technical report describes the inventory of visual resources and potential impacts associated with the proposed highway construction. The following viewing variables were considered and evaluated throughout the study:

- Constituent Information
- Variety Class and Existing Visual Conditions
- Visual Priority Travel Routes and Use Areas, and Land Use Designations
- Project Visibility and Factors Influencing Visibility
- Visual Absorption Capability Levels
- Visual Quality Objectives

Methods Summary

The methodology employed for this study considered three primary components: (1) locations and sensitivities of viewers, (2) characterization of visual quality and Forest Service visual management guidelines, and (3) influences the highway would have on both viewers and the existing natural setting. Each of these components were considered throughout the process in three phases: (1) inventory phase, (2) analysis phase, and (3) compatibility determination phase.

During the inventory phase, aerial imagery, literature, agency consultations, and fieldwork resulted in establishing baseline data associated with viewers, landscape, and the highway. In the analysis phase, relationships were created that consider the following:

1. What is the compatibility of the highway with VQO?
2. What is the visual quality of the existing natural setting?
3. What are some of the details associated with the highway (e.g., cut-and-fill areas) that may affect views and natural landscape features?

Based on the results of this analysis, levels of potential impact were determined.

An analysis was prepared to determine the compatibility of the highway with VQOs of adjacent LUDs. This compatibility analysis was further reinforced through the development of photographic simulations that characterized levels of impact that would occur and to what extent this impact would be compatible with management objectives.

Figure ES-1 generally illustrates the visual resources methodology employed for this study.

Summary of Impacts

Table ES-1 provides a qualitative estimate from very high to low of the visual impacts of project alternatives based on the visibility and visual quality of the lands crossed by the alternatives. Table ES-2 provides the same qualitative estimate based only on the visual quality of the lands crossed by the alternatives. The difference between the two tables is that Table ES-1 focuses on impacts associated with an alternative being viewed from sensitive viewing locations while Table ES-2 focuses only on the impacts to the quality of the existing landscape whether it can or cannot be seen from sensitive viewing locations. Estimates in both tables are provided in terms of the acres that would be impacted.

Based on these tables, the marine alternatives (Alternatives 4A through 4D) would have the least overall impact on visual resources. For Alternatives 2 through 2C and 3, Alternative 3 has the least overall impact on visual resources because it would be sited in areas having less severe terrain than Alternatives 2 through 2C and would have fewer viewers within the foreground and middleground-viewing thresholds.

When considering differences among the East Lynn Canal Highway alternatives, Alternative 2 would result in the greatest visual impacts because it has a long highway segment and a ferry terminal at Katzechin. Visual impacts of Alternative 2C would be slightly less than Alternative 2 because a ferry terminal would not be constructed at Katzechin. Alternative 2A would avoid a highly sensitive landscape of Berners Bay (i.e., the confluence of Lace, Antlers, and Berners rivers), yet a highway would be constructed from the Katzechin delta to Skagway in an equally sensitive landscape. Alternative 2B would result in visual impacts in Berners Bay but would not impact the sensitive landscape between the Katzechin delta and Skagway. The trade off between these two sensitive landscapes has resulted in Alternative 2A having less very high impacts than Alternative 2B, but more high impacts.

Table ES-1
Summary of Impacts on Sensitive Viewers for the Alternatives Considered (acres)

Alternative	Very High Impact on Forest Service Land	Very High on Non-Forest Service Land	High Impact on Forest Service Land	High Impact on Non-Forest Service Land	Moderate Impact on Forest Service Land	Moderate Impact on Non-Forest Service Land	Low Impact on Forest Service Land	Low Impact on Non-Forest Service Land
Alternative 1 – No Action	Not Applicable							
Alternative 2 – East Lynn Canal Highway with Katzeihin Terminal	116	96	1,135	198	1,980	748	398	249
Alternative 2A – East Lynn Canal with Berners Bay Shuttle Highway	47	72	874	161	1,728	712	398	249
Alternative 2B – East Lynn Canal Highway to Katzeihin, shuttles to Haines and Skagway	112	61	637	139	1,612	442	398	249
Alternative 2C – East Lynn Canal Highway with shuttle to Haines from Skagway Highway	Same as Alternative 2							
Alternative 3 – West Lynn Canal Highway	13	34	36	155	781	502	845	444
Alternatives 4B/4D – Marine Alternatives	0	15	10	43	183	156	0	0

Table ES-2
Summary of Impacts on Visual Quality for the Alternatives Considered (acres)

Alternative	Very High Impact on Forest Service Land	Very High Impact on Non-Forest Service Land	High Impact on Forest Service Land	High Impact on Non-Forest Service Land	Moderate Impact on Forest Service Land	Moderate Impact on Non-Forest Service Land	Low Impact on Forest Service Land	Low Impact on Non-Forest Service Land
Alternative 1 – No Action	Not Applicable							
Alternative 2 – East Lynn Canal Highway with Katzeihin Terminal	82	90	1,365	158	2,181	1,043	0	0
Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttle Highway	62	48	1,132	146	1,854	1,000	0	0
Alternative 2B – East Lynn Canal Highway to Katzeihin, shuttles to Haines and Skagway	82	94	872	111	1,805	686	0	0
Alternative 2C – East Lynn Canal Highway with shuttle to Haines from Skagway Highway	Same as Alternative 2							
Alternative 3 – West Lynn Canal Highway	20	170	41	30	1,569	936	45	0
Alternatives 4B/4D – Marine Alternatives	0	13	16	21	177	180	0	0

The general alignments for Alternatives 2 through 2C, 3, 4B, and 4D are contained within the TLMP as Proposed State Road Corridors. All of the alternatives would meet the Visual Quality Objective (VQO) of Modification for the Transportation and Utility Systems (TUS) Land Use Designation (LUD) in the TLMP. Approximately 27 percent of the alignment for Alternatives 2 through 2C would be compatible with the VQO of LUDs adjacent to the TUS LUD, while about

62 percent of the alignment for Alternative 3 would be compatible with the VQO of LUDs adjacent to the TUS LUD.

Although some impacts associated with the implementation of the highway would change existing viewsheds, other scenic viewsheds would be created for potential future travelers along the highway. Based on the exceptional scenic, natural, and cultural attributes found throughout the region, the highway may be eligible, at a minimum, to be designated as a state or national scenic byway; but more likely designated as an All-American Road.

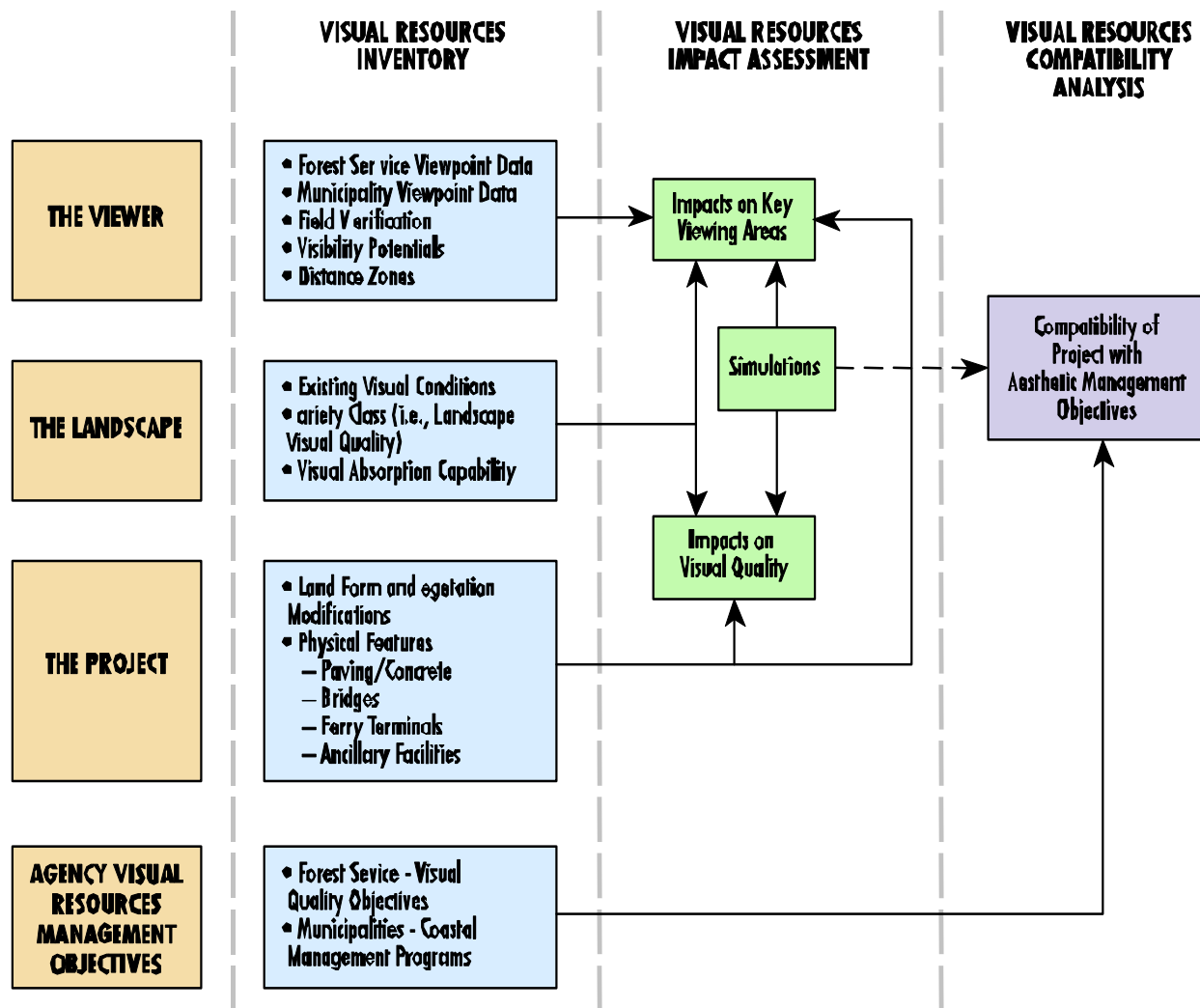


Figure ES-1. Visual Resources Assessment Methodology

1.0 PROJECT DESCRIPTION

1.1 Project Purpose and Need

The purpose of and need for the Juneau Access Improvements Project is to provide improved surface transportation to and from Juneau within the Lynn Canal corridor that will:

- Provide the capacity to meet the transportation demand in the corridor
- Provide flexibility and improve opportunity for travel
- Reduce travel time between Lynn Canal communities
- Reduce state costs for transportation in the corridor
- Reduce user costs for transportation in the corridor

1.2 Project Description

Lynn Canal, located approximately 25 miles north of Juneau, is the waterway that connects Juneau with the cities of Haines and Skagway via the Alaska Marine Highway System (AMHS). At present there is no roadway connecting these three cities. The Glacier Highway originates in Juneau and ends at Echo Cove, approximately 40.5 miles to the northwest.

As required by the National Environmental Policy Act (NEPA), the Supplemental Draft Environmental Impact Statement (SDEIS) for the Juneau Access Improvements Project considers the following reasonable alternatives:

Alternative 1 – No Action Alternative – The No Action Alternative includes a continuation of mainline AMHS service in Lynn Canal as well as the operation of the fast vehicle ferry (FVF) *M/V Fairweather* between Auke Bay and Haines and Auke Bay and Skagway. The *M/V Aurora* would provide shuttle service between Haines and Skagway, beginning as early as 2005.

Alternative 2 (Preferred) – East Lynn Canal Highway with Katzeihin Ferry Terminal – This alternative would construct a 68.5-mile-long highway from the end of Glacier Highway at the Echo Cove boat launch area around Berners Bay to Skagway. A ferry terminal would be constructed north of the Katzeihin River delta, and operation of the *M/V Aurora* would change to shuttle service between Katzeihin and the Lutak Ferry Terminal in Haines. Mainline ferry service would end at Auke Bay, and the existing Haines/Skogway shuttle service would be discontinued. The *M/V Fairweather* would be redeployed on other AMHS routes.

Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttles – This alternative would construct a 5.2-mile highway from the end of Glacier Highway at Echo Cove to Sawmill Cove in Berners Bay. Ferry terminals would be constructed at both Sawmill Cove and Slate Cove, and shuttle ferries would operate between the two terminals. A 52.9-mile highway would be constructed between Slate Cove and Skagway. A ferry terminal would be constructed north of the Katzeihin River delta, and the *M/V Aurora* would operate between the Katzeihin and the Lutak Ferry Terminals. Mainline ferry service would end at Auke Bay, and the existing Haines/Skogway shuttle service would be discontinued. The *M/V Fairweather* would be redeployed on other AMHS routes.

Alternative 2B – East Lynn Canal Highway to Katzeihin with Shuttles to Haines and Skogway – This alternative would construct a 50.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Katzeihin, construct a ferry terminal at the end of the new highway, and run shuttle ferries to both Skogway and Haines from the Katzeihin Ferry

Terminal. The Haines to Skagway shuttle service would continue to operate, two new shuttle ferries would be constructed, and the *M/V Aurora* would be part of the three-vessel system. Mainline AMHS service would end at Auke Bay. The *M/V Fairweather* would be redeployed on other AMHS routes.

Alternative 2C – East Lynn Canal Highway with Haines/Skogway Shuttle – This alternative would construct a 68.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Skagway with the same design features as Alternative 2. The *M/V Aurora* would continue to provide service to Haines. No ferry terminal would be constructed at Katzein. Mainline ferry service would end at Auke Bay, and the *M/V Fairweather* would be redeployed on other AMHS routes.

Alternative 3 – West Lynn Canal Highway – This alternative would extend the Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay. Ferry terminals would be constructed at Sawmill Cove and William Henry Bay on the west shore of Lynn Canal, and shuttle ferries would operate between the two terminals. A 38.9-mile highway would be constructed between William Henry Bay and Haines with a bridge across the Chilkat River/Inlet connecting to Mud Bay Road. The *M/V Aurora* would continue to operate as a shuttle between Haines and Skagway. Mainline ferry service would end at Auke Bay, and the *M/V Fairweather* would be redeployed on other AMHS routes.

Alternatives 4A through 4D – Marine Options – The four marine alternatives would construct new shuttle ferries to operate in addition to continued mainline service in Lynn Canal. All of the alternatives would include a minimum of two mainline vessel round trips per week, year-round, and continuation of the Haines/Skogway shuttle service provided by the *M/V Aurora*. The *M/V Fairweather* would no longer operate in Lynn Canal. All of these alternatives would require construction of a new double stern berth at Auke Bay.

Alternative 4A – FVF Shuttle Service from Auke Bay – This alternative would construct two FVFs to provide daily summer service from Auke Bay to Haines/Skogway.

Alternative 4B – FVF Shuttle Service from Berners Bay – This alternative would extend the Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. Two FVFs would be constructed to provide daily service from Sawmill Cove to Haines/Skogway in the summer and from Auke Bay to Haines/Skogway in the winter.

Alternative 4C – Conventional Monohull Shuttle Service from Auke Bay – This alternative would construct two conventional monohull vessels to provide daily summer service from Auke Bay to Haines/Skogway. In winter, shuttle service to Haines and Skagway would be provided on alternate days.

Alternative 4D – Conventional Monohull Shuttle Service from Berners Bay – This alternative would extend the Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay, where a ferry terminal would be constructed. Two conventional monohull vessels would be constructed to provide daily service from Sawmill Cove to Haines/Skogway in the summer and alternating day service from Auke Bay to Haines/Skogway in the winter.

2.0 METHODS

2.1 Introduction

2.1.1 Overview

This visual resources study is a comprehensive inventory and analysis of visual resources associated with or potentially affected by each project alternative. The Visual Management System (VMS) (Forest Service, 1974 – Vol. 2, Chapter 1) was used as the basis for this study because the majority of land potentially affected by the highway would be on the Tongass National Forest. The VMS was implemented in an effort to maintain consistency with the approach, terminology, and disclosure of potential impacts for lands traversed by the alternatives discussed within the *1997 Juneau Access Draft Environmental Impact Statement* (Draft EIS). Further, to verify consistency (or lack of) with adopted VQOs in the 1997 Tongass Land and Resource Management Plan (TLMP), a compatibility analysis was conducted to indicate where the alternatives may be compatible, not compatible, or undetermined with adopted VQOs for the alternative alignments and lands adjacent to the alignments.

The visual resources study is intended to address the following primary questions:

- To what extent would the highway alter existing viewsheds of sensitive viewers?
- To what degree would the highway change the existing landscape visual quality within the Visual Sphere of Influence (VSOI) (Figure 1)?
- Would the highway be compatible with the Forest Service's Visual Quality Objectives (VQOs) and other agency aesthetic management goals related to visual resources along the Lynn Canal coastline?
- What is the compatibility of the highway with VQOs adjacent to the Transportation and Utility System (TUD) LUD (i.e., VQO of Modification)?

For ease of discussion within this analysis, the alternative alignments considered have been segmented at each milepost and identified as "links" on project maps. Depending on the complexity or homogeneity of conditions, the links may be grouped or discussed individually in unique situations. The convention utilized for link labeling is as follows:

East Lynn Canal Highway alternatives (includes portions of the West Lynn Canal Highway Alternative and Alternatives 4B and 4D along Links E-34, E-35, E-36) – E-1 (vicinity of Skagway) south through E-36 (Echo Cove)

West Lynn Canal Highway Alternative (includes portions of the East Lynn Canal Highway Alternative and Alternatives 4B and 4D along Links E-34, E-35, and E-36) – W-1 (near Haines) south through W-22 (William Henry Bay)

2.1.2 Key Premises and Concepts

Substantive key premises and concepts considered during the visual resources inventory included the following:

Identification of sensitive viewpoints, viewing areas, and travel routes – It was through this effort that relationships were developed between the distance of a viewer and the highway. That is to say, how susceptible would a viewer be of receiving an impact. Moreover, what is the severity of impact potentially received based on this relationship.

Characterization of the inherent visual quality of the existing landscape setting – It was through the characterization of the existing landscape setting that a relationship was derived that compared the existing setting to potential landform and vegetative modifications created by the highway. The results of this consideration led to a determination related to the extent of potential change occurring within a specific area along the proposed alternatives.

Analysis of compatibility with Forest Service VQOs adjacent to the TUS LUD – It was through this analysis that a relationship was created between the potential level of impact of the highway and the degree to which the impact would or would not be compatible with adopted Forest Service VQOs on lands adjacent to the highway. The TUS LUD has an adopted VQO of Modification. The VQO of Forest Service lands adjacent to the highway alignments range from Modification to Retention. This analysis considered adjacent VQOs and the compatibility of the highway with these VQOs.

In an effort to address the above three concepts, visual resource data (e.g., sensitive viewpoints, natural features) were collected within a four-mile-wide buffer through field reviews, agency contacts, and literature reviews and mapped along the proposed alternatives. Additionally, VQOs were mapped based on Forest Service data provided.

An assessment was made related to non-forest lands potentially affected by highway segments of the alternatives based on the enforceable policies associated with the Juneau, Haines, and Skagway Coastal Management Programs. The Coastal Management Programs have no formalized and systematic process for evaluating visual resources; therefore, it is not possible to determine the compatibility of visual resource changes resulting from project alternatives with the enforceable policies of these programs.

2.1.3 Regional Setting

The region is well known for its high visual qualities based on predominantly natural and undisturbed landscapes within the Coast-Range Visual Character Type. Obvious natural features that accentuate geologic forces influencing them are available for detailed viewing throughout this character type. From wind- and water-eroded rounded islands, to smoothed cliff faces at various stages of glacier flow, to entire stands of forests flattened by avalanches, to meltwater forming large areas of diverse wetlands, this character-type offers views of an ever-changing natural setting for all who visit the region.

Lynn Canal is characterized by very steep slopes on either side, surmounted by spectacular, rugged mountainous terrain, snowfields, and glaciers. High elevations along Lynn Canal range from approximately 5,000 to 7,000 feet, and are marked by rugged peaks, rock faces, occasional glaciers, and extensive icefields atop mountainous shelves. The moderate-to-steep slopes along and adjacent to Lynn Canal are primarily densely forested within a typically undisturbed coniferous closed-canopied forest. The steep valley sides are broken at intervals by glaciated valleys, with rivers carrying sedimentation from meltwater becoming braided stream channels. At the mouth of these rivers, the valleys widen to form extensive wetland areas with visually interesting vegetation types. In a few locations, glaciers extend down these valleys and approach sea level, creating spectacular landscape features within the foreground threshold (e.g., Davidson Glacier).

More gently sloping terrain occurs at lower elevations in a few coastal areas adjacent to Lynn Canal. Within these areas, the irregular rocky coastline provides visual variety when juxtaposed by high mountain ranges of glaciated icefields often visible in the background. Islands of various sizes are scattered throughout Lynn Canal. These islands are typically rounded in form and of low elevations, as a testament to the tremendous geologic forces influencing isolated

landmasses within this wide canal. Sullivan Island and Admiralty Island (south and outside of the VSOI) are two of the most notable islands within the region.

Weather conditions also are an important influence on the visual character of the region. During frequent periods of low cloud and rain, much of the most spectacular higher elevation scenery becomes invisible, and landscape features at foreground (0 to 0.5 mile) distances are often obscured by fog and rain. Visual acuity is usually reduced under these weather conditions, as the landscape tends to meld into indistinctive landmasses of similar color and texture. Conversely, less typical bright and clear days offer an opportunity for viewers to witness memorable scenery at a regional scale. Striking landmasses complement and balance surface colors and line features which provide depth and clarity within a 360 degree viewing forum. Stark white glacier fields, which migrate toward (i.e., Davidson Glacier) or recede from the Lynn Canal coastline, are apparent intermittently along the canal. Further, dark gray, jagged avalanche shoots and wide, braided river valleys further accentuate a virtually pristine setting.

2.1.4 Visual Resource Issues

This section describes both overall issues associated with visual resources and specific project issues related to sensitive viewers and landscape visual quality. Substantive issues associated with visual resources that were identified during the 1997 and 2003 scoping periods included the following:

- Agency and public concerns of increasing viewer sensitivity to visual changes on lands within the Tongass National Forest and within municipality coastal management areas
- Agency concerns for increased visitor expectations of landscape visual quality on public lands along the highway
- Agency concerns for increased views from recreational areas
- Agency concerns for the compatibility of the highway with VQOs adjacent to the TUS LUD (i.e., VQO of Modification)
- Public concerns for the value of natural-appearing open spaces on private lands
- Increased uses and users on public land

Specifically, a highway may be located between Juneau and Skagway or Juneau and Haines adjacent to and including Lynn Canal. As described earlier, this area retains exceptional visual qualities and is well known as an international tourist attraction with primarily marine routes linking Juneau, Haines, and Skagway along an otherwise largely undeveloped yet constantly changing coastline. The primary issues regarding visual resources along the proposed alternatives are as follows:

- Views from the AMHS ferries and tour cruises that circulate from Juneau to Haines and Skagway
- Views from recreation areas (e.g., cabins, trails, parks, national monuments)
- Views from frequently used shoreline areas or anchorages (e.g., boaters, fishermen, hunters, beachcombers, sightseers, hikers)
- Views from existing roads and settlements (i.e., Haines and Skagway)
- Changes in the inherent visual qualities and intact (pristine) landscape character within the VSOI
- Compatibility with Tongass National Forest VQOs adjacent to the TUS LUD

2.1.5 Methodology

Visual resources along the alternatives were analyzed within the VSOI in terms of variety classes, existing visual condition, occurrences of visual priority travel routes and use areas, land use designations, visual absorption capabilities, and the visibility of the highway. These components were used to establish levels of potential impacts associated with the highway and to evaluate consistency with adopted Tongass National Forest VQOs.

The next sections discuss the methodology utilized for the following visual resources inventory components:

- Constituent Information
- Variety Class (i.e., visual quality) and Existing Visual Conditions
- Visual Priority Travel Routes, Use Areas, and Land Use Designations
- Project Visibility and Factors Influencing Visibility
- Visual Absorption Capability Levels
- Visual Quality Objectives

Additionally, photo-realistic simulations were prepared for the highway. These simulations assisted in (1) depicting typical views of the highway, (2) evaluating potential locations of applied mitigation, and (3) verifying the results of the visual resources impact assessment. These simulations can be viewed at the end of the environmental consequences section.

2.1.5.1 Constituent Information

Constituent information was gathered during this study in an effort to update locations of sensitive viewers and viewing areas that included Forest Service visual priority travel routes and use area data, referencing the following documents:

- TLMP, 1997 (including supplements and amendments)
- U.S. National Park Service, Klondike Gold Rush National Historic Park General Management Plan, 1993
- Alaska Coastal Management Program
- The Juneau Coastal Management Plan
- City and Borough of Juneau Comprehensive Plan, 1988
- City of Haines Coastal Management Plan, 1993
- Haines Borough Comprehensive Plan
- Skagway Coastal Management Plan (including Areas Meriting Special Attention)
- Skagway Comprehensive Plan

2.1.5.2 Variety Class and Existing Visual Condition

2.1.5.2.1 Variety Class

The inventory related to variety classes for both Forest Service and non-forest land began by characterizing the VSOI's physiography in terms of the inherent visual quality a particular landscape may retain. As stated previous, the highway would occur within the Coast-Range Visual Character Type.

Tongass National Forest variety class data were utilized as baseline data to identify ranges of inherent visual quality within the VSOI. Non-forest lands also were assessed a specific variety class based on the definitions found in Table 1 for this landscape character type. Three levels of variety classes were used: A, B, and C. To evaluate potential impacts of alternative corridors equally, it was assumed that all landscapes have some level of inherent scenic value ranging from variety class A to variety class C. Landscapes with a greater diversity of natural or positive cultural amenities were considered to have greater aesthetic appeal and, therefore, higher levels of inherent visual quality (e.g., variety classes A or B), with variety class A representing the most distinctive landscapes and variety class C the least distinctive.

Additionally, and performed concurrently with this task, an inventory of the existing visual condition that occurs along the alternatives was conducted for areas outside of the Tongass National Forest. The Tongass National Forest provided existing visual condition data on lands administered by the Forest Service. Field analysis and review of municipality plans assisted in the identification of existing visual condition on non-forest lands.

2.1.5.2.2 Existing Visual Condition

Existing visual condition is described as the level of noticeable visual change in the existing landscape setting. Existing visual condition indicates the level of change that is perceptible at the time a landscape is inventoried, and is used in identifying visual resource issues, analyzing landscapes to determine their condition relative to their VQO, estimating the potential cumulative effects of management activities, monitoring the progress of landscape recovery from management activities, and recording a history of the degree and quantity of physical alteration that has occurred in a landscape. It should be noted that the existing visual condition may or may not be considered the future desired condition of a particular setting. In fact, it is understood that a landscape would heal to a certain degree following management actions. It is this look to the future that typically factors desired future condition land-management objectives.

A series of six Forest Service existing visual condition levels are used to describe the landscape, ranging from untouched to intensively modified. It should be noted that an evaluation of existing visual condition was made for non-forest lands utilizing the definitions found in Table 3.

Table 1
Variety Class Criteria for the Coast-Range Visual Character Type

	A – Distinctive	B – Common	C – Minimal Variety
Terrain Features	Unit characterized by highly complex terrain dominated by massive angular profiles and sharply defined crests frequently penetrated by deep glacial troughs and fiords. Strong edge contrasts and spatial definition. Moderate spatial variety.	Unit characterized by moderately complex-to-complex terrain dominated by angular profiles and sharply defined crests often penetrated by prominent inlets and bays. Strong edge contrasts and spatial definition. Moderate spatial variety.	Unit characterized by moderately diverse terrain dominated by blocky occasionally angular profiles and well-defined crests indented by minor bays and coves. Moderate edge contrasts and spatial definition. Little spatial variety.
Geologic Features	Unit characterized by numerous and/or highly significant geologic features (matterhorn peaks, massive rock outcrops and sheer glacially scoured escarpments, expansive floodplains, large deltas, major examples of mass wasting, and large moraines are typical examples); major features that tend to dominate other objects of the visual field.	Unit characterized by moderately significant geologic features (secondary peaks, escarpments, cirques, rock outcrops, and floodplains are typical examples); features that tend toward co-dominance with other objectives of the visual field.	Unit characterized by somewhat insignificant geologic features (minor peaks, escarpments and rock outcrops, minor examples of mass wasting, and small isolated sand beaches are typical examples); features that are usually subordinate to or are occasionally co-dominant with other objects of the visual field.
Vegetative Patterns	Unit characterized by a highly vegetative pattern (many major plant cover types are apparent). Many variations of color and texture. Natural forest openings and/or patches of vegetation are sharply defined tending to dominate or share dominance with other objects of the visual field.	Unit characterized by a moderately varied vegetative pattern (a few major plant cover types are apparent). Some variation of color and texture. Natural forest openings and patches of vegetation are subtly defined tending toward co-dominance with or are subordinate to other objectives of the visual field.	Unit characterized by more or less uniform vegetative pattern (only one major plant cover type is apparent). Little (if any) variation in color and texture, few (or no) natural forest openings and/or patches of vegetation. Vegetative cover edge contrast tends to be minimal in relation to the visual field.
Water Features	Unit characterized by numerous and/or highly significant water features (prominent glaciers, snow fields and ice floes, diverse shorelines and associated saltwater features, moderately large lakes, major rivers, waterfalls and clusters of colorful tarns are typical examples); features that tend to dominate or are co-dominant with other objectives of the visual field.	Unit characterized by moderately significant water features (secondary glaciers, minor snow fields, moderately large streams, small distinctive lakes or clusters of tarns, secondary waterfalls, somewhat diverse shorelines and associated saltwater features are typical examples); figure objects that tend toward co-dominance with other objects of the visual field.	Unit characterized by somewhat insignificant water features (shorelines and associated saltwater features of little diversity, minor unfigured lakes, ponds or bogs, and minor streams are typical examples); these features tend to be subordinate to other objects of the visual field.

Table 2
Forest Service Existing Visual Condition Definitions

Type I	Landscapes where only ecological change has taken place, except for trails needed for access. These landscapes appear to be untouched by human activities (natural).
Type II	Landscapes where changes are not noticed by the average forest visitor, unless pointed out. Landscapes that have been altered but changes are not perceptible.
Type III	Landscapes where changes are noticeable by the average forest visitor, but they do not attract attention. The natural appearance of the landscape remains dominant. Changes appear to be minor disturbances.
Type IV	Landscapes where changes are easily noticed by the average forest visitor and may attract attention. Changes appear as disturbances but resemble natural patterns in the landscape. <u>Not identified within VSOI.</u>
Type V	Landscapes where changes are very noticeable and would be obvious to the average forest visitor. Changes, tend to stand out dominating the view of the landscape, yet they are shaped to resemble natural patterns when viewed from middleground or background distance zones. <u>Not identified within VSOI.</u>
Type VI	Landscapes where changes are in glaring contrast to the landscape's natural appearance. Changes would appear as dramatic, large-scale disturbances that would strongly affect the average forest visitor <u>Not identified within VSOI.</u>

Note: VSOI = Visual Sphere of Influence

2.1.5.3 Visual Priority Travel Routes, Use Areas, and Land Use Designations

Key viewing areas that may have views of the highway were identified, inventoried, and populated within the geographic information system (GIS) database out to four miles of the assumed alternative centerlines. Viewpoints within the VSOI were identified through personal contacts with the Forest Service and review of existing and planned land use data.

Other areas of high priority for visual resources reflect community values and local government, or private land issues. These have been identified from recognized use patterns outside Forest Service land or where public concerns related to visual quality has been identified.

As stated previous, The Tongass National Forest has assigned a LUD of TUS to all highway segments of the alternatives being considered in this analysis. This TUS LUD allows for a moderate to high degree of visual change to occur within the foreground viewing threshold of priority travel routes and use areas. Furthermore, the management prescriptions for the TUS state a "Desired Condition" that transportation facilities be "designed to be compatible with the adjacent LUD to the maximum extent feasible." This includes compatibility with the VQOs of adjacent LUDs. Table 3 discusses the acceptable ranges of visual modifications associated with Forest Service LUDs.

Table 3
Adopted Visual Quality Objectives (VQO) for Each Landuse Designation

Land Use Designation	Foreground	Middleground	Background	Not Seen or Non-Priority
Wilderness Wilderness Nat. Monument Research Natural Area Special Interest Area ^{2,4} Remote Recreation Old-growth Habitat ⁴ LUD II ⁴	Retention	Retention	Retention	Retention
Special Interest Area ^{3,4}	Modification	Partial Retention	Partial Retention	Not Applicable
Semi-remote Recreation ⁴	Partial Retention	Partial Retention	Partial Retention	Partial Retention
Wild River ⁶	Retention	Retention	Retention	Retention
Scenic River ^{4,6}	Retention	Partial Retention	Partial Retention	Modification
Recreational River ^{4,6}	Partial Retention	Modification/Partial Retention	Modification/Partial Retention	Maximum Modification
Scenic Viewshed ⁴	Retention	Partial Retention	Partial Retention	Maximum Modification
Modified Landscape ⁴	Partial Retention	Modification	Modification	Maximum Modification
Timber Production Minerals Experimental Forest ⁵	Modification	Maximum Modification	Maximum Modification	Maximum Modification
Transportation and Utility System ⁶	Modification	Not Applicable	Not Applicable	Not Applicable
Municipal Watershed	A range of visual conditions may exist in the watershed, which are a result of the municipality's watershed management objectives. Visual impacts should be minimized as seen from Visual Priority Travel Routes and Use Areas.			
Non-wild Nat. Monument	VQO's will range from Retention, in those portions of the Monument without access, to Maximum Modification, in those portions developed in connection with mineral activities. Site-specific VQO's will be identified in the specific plan of operation for mineral development.			

- Notes:
- ¹ The foreground, middleground, and background VQO's are adopted as soon from the Visual Priority Travel Routes and Use Areas (Appendix F in the TLMP). Non-priority travel routes and use areas, and those areas not seen from the Visual Priority Routes and Use Areas, are managed according to the direction listed in the "Not Seen or Non-priority" column.
 - ² Except for the developed recreation and interpretive portions of Special Interest Areas such as Mendenhall Glacier, Ward Cove, and Blind Slough.
 - ³ Applies only to the developed recreation and interpretive portions of Special Interest Areas such as Mendenhall Glacier, Ward Cove, and Blind Slough. Undeveloped areas are managed according to the guidance on the previous line.
 - ⁴ Exceptions for small areas of non-conforming developments, such as recreational developments, transportation developments, Log Transfer Facilities, and mining development, may be considered in these Land Use Designations on a case-by-case basis.
 - ⁵ The VQO may vary depending on the research objectives of the Experimental Forest.
 - ⁶ These objectives apply only to the actual corridor. The area adjacent to this LUD is managed according to the guidelines of the adjacent Land Use Designation.
 - ⁷ Apply the Partial Retention VQO in corridors where scenic quality is included as one of the "outstandingly remarkable" values for that corridor. If it is not, apply the lower VQO.

2.1.5.4 Project Visibility and Factors Influencing Visibility

2.1.5.4.1 Project Visibility

The majority of viewers who may see highway are residents, tourists, local travelers and recreational users primarily using water travelways and hikers along trails. Because viewing the natural landscape is an important part of a recreational experience, most of these viewers are sensitive to changes in the landscape.

The visibility analysis considered the following three major components that assisted in establishing where the highway may be seen or unseen from visual priority travel routes or use areas: (1) topography, (2) viewer distance, and (3) the highway (e.g., roadway, ferry terminals, bridges, cut-and-fill areas).

Visibility of the landscape from visual priority travel routes or use areas generally dictates the visual exposure of an area. The Forest Service maps visibility at distance zones, which influence how clearly visual features of the highway would be perceived in the landscape, at the following distance zones:

- Immediate Foreground (0 to 300 feet)
- Foreground (0 to 0.5 mile)
- Middleground (0.5 to 4 miles)
- Background (beyond 4 miles)

More specifically, the visibility analysis utilized GIS, which incorporated digital elevation models over United States Geological Survey (USGS) quadrangles. Parameters established to conduct this analysis are described below.

- The viewer was 5.5 feet tall.
- Vertices along the alternatives were spaced every 1/10 of a mile.
- The viewing area was defined as 16 miles from either side of the assumed centerline of the proposed alternatives.
- Pursuant to Forest Service visibility modeling direction, vegetative screening was not considered.

2.1.5.4.2 Factors Influencing Visibility

Perceivable elements that make up the visual fabric of landscape settings consist of the combinations, interrelationships, layering, and juxtapositions between form, line, color, and textural components. The visual resources impact assessment model (discussed in the following sections) was designed to predict the potential level of change the highway may have on these elements as it relates to the existing setting. Following is a discussion of these components and how each may be affected by the highway (e.g., cut/fill areas, bridges, the roadway, ferry terminals).

Form

The introduction of a highway and associated cleared area within a natural setting can create a level of contrast on naturally occurring form elements within a landscape setting. Changes to the natural occurring forms of hills and mountain slopes can be very noticeable within the foreground and middleground distance thresholds. Conditions under which the highway has the most noticeable impact on natural form characteristics typically occurs at hill tops where a defined and noticeable niche is created within a closed-canopy forested area that can be visible for great distances (greater than four miles dependent on viewing angle and atmospheric conditions).

Proposed new ferry terminals associated with this project can create form contrast by introducing more perfect geometric shapes within a natural setting of sloping hillsides and jagged mountain edges.

Additionally, proposed bridges can create distinct form contrast within the existing setting as horizontal and vertical forms of the bridge deck and support uprights compete with more natural curvilinear and round forms created by glaciated river valleys, and to a certain degree, concave forms created across the landscape by avalanches.

Line

Land clearing associated with the highway can cause a highly noticeable linear band, sometimes enhanced by shadows and sun reflectivity, that fragments natural line characteristics in landscapes. This line typically can be seen from many miles away. Within the foreground-viewing threshold, the horizontal edge effect created by roadside railing would create a distinct line across an otherwise natural setting. At the middleground and background distance zone, lines created from cuts and fills would be more noticeable than roadside railing. Additionally, the shadowing created by land clearing activities introduces a noticeable line within landscapes. This condition usually occurs on north-facing slopes during the early evening and morning hours when the sun is low on the horizon and the highway is backlit.

Further, proposed new ferry terminals associated with this project can create line contrast by introducing straightedge elements within a nature setting of sloping hillsides and jagged mountain edges.

Additionally, proposed bridges can create a distinct line contrast within the existing setting as direct and distinct fabricated lines of the bridge deck and support uprights compete with more natural curvilinear and rounded forms. Moreover, shadows created throughout the day by the sun's rotation also would cause line contrast. This condition would be more prevalent within the foreground and middleground-viewing thresholds. It should be noted that line contrast created by bridges would be substantially less than line contrast created by clearing land and constructing the highway.

Color

The primary influence in contrasts to natural color characteristics in a setting typically is associated with the clearing of the highway that creates a lighter, sometimes silhouetted band across the landscape. This affect can last up to 10 years after construction. Between 10 and 30 years, the soil and rock would weather and blend more naturally into the landscape.

Proposed new ferry terminals associated with this project can create color contrast within the foreground-viewing threshold, independent of the color selected for exterior treatment. At greater distances, darker colors would blend more naturally within the existing setting. Proposed bridges can create a distinct color contrast similar to that of proposed ferry terminals, yet would be more expansive across the natural setting.

Texture

Within the foreground-viewing threshold of the alternatives, texture contrast is apparent on proposed transportation facilities including ferry terminals, railings, and bridges. These components would insert a fabricated feature within an otherwise natural and pristine setting. As distance increases, texture contrast would lessen more quickly than form, line, or color contrast.

Additionally, the clearing of the highway can cause a texture change from within a homogeneous canopy-covered landscape setting to an abrupt fragmentation of this closed canopy.

2.1.5.5 Visual Absorption Capability Levels

Pursuant to Forest Service Manual 2300, Chapter 2380 (as amended 8/77) the visual absorption capabilities (VAC) methodology was used to characterize all landscapes within the VSOI in terms of its ability to absorb the highway. Visual absorption capability levels were then integrated with data related to distance zones and other visibility factors to establish direct potential impacts the highway may have on sensitive viewers as well as on visual quality. Identification of visual absorption capability levels required the inventory and integration of existing land cover data, slope data, and viewer distance. The following paragraphs discuss the history of the term *visual absorption capability* as well as a definition of VAC.

History of the Term VAC

The term “visual absorption” was first used by Peter Jacobs and Douglas Way in 1969 when they defined it as the varying ability of different landscapes to screen or mask development activities based on vegetative density, topographic closure and visual complexity (Jacobs and Way, 1969).

Definition of VAC

Visual absorption capacity is a classification system used to indicate the relative ability of any landscape to accept human alteration without loss of landscape character or scenic condition. Visual absorption capability is a relative indicator of the potential difficulty, and thus the potential cost, of producing or maintaining acceptable degrees of scenic quality. It can be used to predict achievable scenic condition levels resulting from known management activities in a landscape.

Thus, visual absorption capability is a useful tool in forest planning and in modifying management activities to meet landscape character goals and scenic condition objectives. It may be used to specify the most efficient location for a human alteration or structure on the landscape, so that a project will be accomplished easily, at low cost, and with minimal reduction in scenic quality. (, Landscape Aesthetics, A Handbook to Scenery Management, 1996)

The visual absorption capabilities inventory also considered the scale and spatial dominance of the highway within landscape settings. Scale dominance is related to the relative height and massiveness (e.g., cut-and-fill areas) of the highway when compared to other features within a particular landscape setting. For example, if a 6-foot-tall person stood next to a 150-foot cut slope it can be argued that the cut slope would have scale dominance over the person. Conversely, if the cut slope were compared to Davidson Glacier, it can be argued that the glacier has scale dominance over the cut slope or that the cut slope would be subordinate to the glacier.

Spatial dominance relates to the relative domination the highway would have within a geographic area. For example, a ferry terminal located in William Henry Bay may have a greater domination of the “space” when compared to a similar facility located in Berners Bay, as William Henry Bay can be characterized as a smaller and more confined space.

The method by which scale and spatial dominance was addressed in this study included the evaluation of the distance a sensitive viewer was from the alternatives. Typically, the farther a viewer is from the alternative, the less dominating the highway would be perceived.

The assignment of visual absorption capabilities also considered exposed soil color as a result of highway clearing activities. While it was determined that lighter-colored soils would be exposed as a result of vegetative clearing during construction, which would be noticeable from background and closer viewing thresholds, it also was recognized that time may be effective in reducing this impact.

2.1.5.6 Visual Quality Objectives

As previously stated, the Forest Service VMS served as the basis to employ a consistent methodology within the visual resource inventory and to assess potential impacts of the highway as well as to maintain consistency with the 1997 Draft EIS approach. VQOs adopted to national forest system lands within the TLMP establishes parameters for the level of acceptable visual change permitted in any particular landscape setting and within particular LUDs (see Table 3).

The Forest Service derives VQOs for its lands through the evaluation of three primary elements: (1) identification of variety classes, (2) viewer concern for change (e.g., sensitivity level, visual priority travel routes and use areas), and (3) distance. In turn associated land use designations (LUD) are prescribed, over-laid onto VQO, and evaluated with a focus on acceptable level of visual change within LUD. Table 4 provides definitions of VQO classifications recognized in the TLMP. For additional information related to Tongass National Forest direction related to adopted VQOs, please refer to the TRLMP in the following sections:

- Page 3-158 – Transportation and Utility System Land Use Designation
- Pages 3-162-153 – Scenery Management Prescriptions
- Page 4-76 – Scenery Standards & Guidelines
- Page 4-80 – Upper Allowable Limit for TUS LUD VQO

Additionally, local municipality plans were reviewed for identification of visual management direction. It was determined that recommendations identified within community Coastal Management Programs clearly establishes direction to the extent practical and feasible to avoid development that may alter the current existing visual condition and that high priority is given to maintain existing scenic viewsheds. Table 5 presents substantive enforceable policies for the communities of Juneau, Haines, and Skagway identified in respective Coastal Management Programs related to scenery.

Table 4
Visual Quality Objective Definitions

Retention
This VQO provides for management activities, which are not visually evident. Under Retention, activities may only repeat form, line, color, and texture, which are found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc. should not be evident.
Partial Retention
Management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape, but changes in their qualities of size, amount, intensity, direction, pattern, etc. remain visually subordinate to the characteristic landscape.
Modification
Under the modification VQO, management activities may visually dominate the original characteristic landscape. However, activities of vegetative and landform alteration must borrow from naturally established form, line, color, and texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type.
Maximum Modification
Management activities of vegetative and landform alterations may dominate the characteristic landscape. However, when viewed in the background, the visual characteristic must be those of natural occurrences within the surrounding area or character type.

Note: VQO = Visual Quality Objective

Table 5
Coastal Management Program – Enforceable Policies Related to Visual Resources

Community	Section and Page	Citation
City and Borough of Juneau	Coastal Development, Section 49.70.905, paragraph (10), page 3	(10) To the extent feasible and prudent, port and harbor uses shall minimize the negative aesthetic impact of their use and activities, shall enhance and maintain the positive visual aspects of their development, and shall provide opportunities for public viewing of such positive aspects.
	Coastal Development, Section 49.70.905, paragraph (12), page 4	(12) To the extent feasible and prudent, development shall not detract from the scenic qualities of the shorelines, shall be compatible with its surroundings and shall not significantly block scenic vistas.
	Transportation and Utilities, Section 49.70.925, paragraph (a), page 12	(a) Highway and airport design, construction and maintenance shall take all feasible and prudent steps to prevent alteration of watercourses, wetlands and intertidal marshes, and aesthetic degradation.
	Transportation and Utilities, Section 49.70.925, paragraph (c), page 13	(c) Roads and utilities shall be designed and built so as to protect shore features and other uses that may be affected by pollution, flooding, erosion and other adverse effects.
City of Haines	Coastal Development Policies, Section A-11, Mitigation, General, page 4	A-11, Mitigation, General All land and water use activities shall be planned and conducted to mitigate potentially significant adverse impacts on fish and wildlife populations and their valuable habitats, on commercial, sport and subsistence harvest activities, on air and water quality, and on cultural and recreational resources of local, state or national significance. Mitigation requirements shall be as specified within the most current applicable state and Forest Service laws and regulations and ordinances of the City of Haines.

Table 5 (continued)
Coastal Management Program – Enforceable Policies Related to Visual Resources

Community	Section and Page	Citation
City of Haines (continued)	Coastal Development Policies, Section E, Transportation and Utilities Policies, Subsection E-2, Siting and Operations, paragraph a, page 13	a. Significant adverse impacts to habitats, biological resources, coastal resources and uses, and recreation and traditional subsistence use activities shall be minimized.
City of Skagway	General Policies, Section 1.11, page 3	1.11 Industrial, port and harbor development shall be located, designed and managed, to the extent feasible, so that other appropriate uses are neither subject to substantial or unnecessary adverse environmental impacts, nor deprived of reasonable, lawful use of navigable waters.
	Coastal Development Policies, Section 1.21, page 4	1.21 The Port Authority and industrial users of the port and harbor shall minimize the negative aesthetic impact of their use and activities, shall enhance and maintain the positive visual aspects of their development, and provide opportunities for public viewing of such positive aspects whenever practical and safe.
	Coastal Development Policies, Section 1.24, page 5	1.24 New development will be encouraged to provide physical or visual access to shorelines when such access does not cause interference with operations or hazards to life and property.
	Transportation and Utilities Policies, Section 5.2, page 13	5.2 Developers shall be required to install or establish access roads and utilities of a quality and type as needed to best protect shore features and other uses that may be affected by pollution, nuisances, flooding, erosion, and other adverse effects unless no feasible and prudent sites exist.
	Transportation and Utilities Policies, Section 5.4, page 13	5.4 Highway and airport design, construction and maintenance shall minimize alteration of watercourses, wetlands and intertidal marshes, and aesthetic degradation.
	Transportation and Utilities Policies, Section 5.6, page 13	5.6 Where practicable, the city shall establish buffers and setbacks to maintain the scenic quality of the Dyea Road and Klondike Highway transportation corridors. Prior to development activities within 100 feet of the centerline of the Dyea Road and Klondike Highway rights-of-way, development plans must be reviewed to determine that the project was designated to blend with the area's visual character. Any development along the Klondike Highway shall, to the extent feasible, conform to the Alaska Department of Natural Resources Haines-Skogway Area Land Use Plan.
	Transportation and Utilities Policies, Section 5.7, page 14	5.7 The city shall have active participation in the writing, review and approval of any scenic corridor study undertaken by the state.

3.0 AFFECTED ENVIRONMENT

Components of this section describe the results of the visual resources inventory:

- Landscape Units, Variety Class (i.e., visual quality) and Existing Visual Condition
- Visual Priority Travel Routes, Use Areas, and Land Use Designations
- Project Visibility and Factors Influencing Visibility
- Visual Absorption Capability Levels
- Visual Quality Objectives

Within each inventory component considered for this project, associated tables, charts, and maps are provided to provide the reader with an illustrative understanding of the (1) specific location of the inventoried resource (depicted on resource maps), (2) relative percentage of occurrence of that resource (identified within resource pie charts), and (3) magnitude (i.e., acres) potentially affected (presented within associated resource tables). For Alternatives 4A and 4C, resource inventories have not been calculated as these are entirely marine alternatives. For Alternatives 4B and 4D and a portion of Alternative 3 (Glacier Highway to Sawmill Cove Ferry Terminal), the resource inventories are identical along Links E-34, E-35, and E-36, as these links are shared by highway segments of these three alternatives or portions thereof.

3.1 Landscape Units, Variety Class, and Existing Visual Conditions

Variety classes along Lynn Canal create a mosaic of overlapping scenes when passing from one landscape unit to another with very different spatial and scenic characteristics. These units form the principal context for assessing potential visual quality and viewer impacts. In clear weather, each is typically seen as a whole unit, combining views of the water, shoreline, mountainsides, and rock features at higher elevations in the overall setting. Generally, the VSOI can be aggregated into the following major landscape units from which variety classes were derived.

3.1.1 Landscape Units

3.1.1.1 Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highway Alternatives

Links E-1 to E-8: The Taiya Inlet corridor from Skagway to Taiya Point, a linear narrow marine corridor about one mile wide with uniformly steep mountains on both sides. These offer distinctive views of cascading streams, talus slopes, and colorful rock formations. Further, the setting forces a focal view when traversing through this inlet as perpendicular middleground and background views are substantially limited by adjacent topography.

Links E-8 to E-20: The Chilkoot Inlet corridor, about two to three miles wide, from Taiya Point to Eldred Rock, with the low hills of the Chilkat Peninsula and Islands forming the western side, and continuous precipitous mountainsides on the eastern side. The latter is broken only by the mouth of the broad Katzeihin River Valley, almost one mile wide.

Links E-20 to Links E-28: From Eldred Rock to Point St. Mary, the canal ranges from five to eight miles wide, with more moderate slopes, lower elevations, and uniform forest cover.

Links E-28 to E-36: Berners Bay, which forms a large bay almost three miles wide, opening off Lynn Canal, with more distinctive enclosing mountainsides and varied coastline ranging from rocky shores to extensive wetlands at the mouths of several rivers.

3.1.1.2 Alternative 3 – West Lynn Canal Highway Alternative

Links W-1 to W-10: The Chilkat Inlet corridor, approximately three miles wide, between the forested Chilkat Peninsula and islands to the east, and the rugged mountainsides and glaciers of the Chilkat Range to the west.

Links W-10 to W-14: The straits west of Sullivan Island, which forms another bay (one to two miles wide) almost cut off from the main Lynn Canal by the island, with steep mountainsides to the west.

Links W-14 to W-22: Coastline within the vicinity of the Endicott River Wilderness with more rugged and mountainous closed terrain. Visible glacier fields are rare in this unit.

3.1.1.3 Alternatives 4B and 4D

Landscape units along the highway segments of these alternatives would be identical to those described under Alternative 2 within the vicinity of Echo Cove (i.e., Links E-34, E-35, and E-36).

3.1.2 Variety Class

The following sections provide a discussion of variety classes A, B, and C identified along the alternatives.

3.1.2.1 Variety Class A

Typically, variety class A landscapes are often associated with avalanche chutes, braided streams, steep slopes with rock outcrops, glaciers, and scenic shoreline features. Examples of these areas identified by the Forest Service include the following:

3.1.2.1.1 Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highway Alternatives

Links E-30 and E-31: The head of Berners Bay, including the mouths of the Berners, Lace, Antler and Gilkey rivers and adjoining slopes. These areas are described as having “outstanding” and “remarkable” scenic values. Portions of the Gilkey River (at the eastern edge of the VSOI) are recommended by the Forest Service as being eligible for a congressionally designated wild and scenic river status.

Links E-23, E-24, and E-25: A narrow coastal strip near Comet, on the east side of Lynn Canal, north of Berners Bay. From here a juxtaposition of landscape units create a striking viewshed of overlapping foreground, middleground, and background landscape components consisting of foreground waterscape views coupled with rolling hills of a closed deep green forest in the middleground threshold, accented with background views of steep, jagged glacier-capped white mountains.

Link E-17: The steep slopes and drainages below Sinclair Mountain on the east side of Lynn Canal opposite the Chilkat Islands.

Link E-11: The Katzeihin River valley and mouth, which can be characterized as exceptionally scenic. Portions of the Katzeihin River are recommended by the Forest Service as being eligible for a congressionally designated wild and scenic river status.

Link E-1: Area surrounding Skagway and the Dyea Inlet to the east.

3.1.2.1.2 Alternative 3 – West Lynn Canal Highway Alternative

Link W-22: The shoreline of William Henry Bay. This bay is small by comparison to Berners Bay. Visual acuity at a close distance to the shoreline is enhanced. Layerings of topography and patches of vegetation, coupled with shoreline rock formations, make this a distinct landscape.

Links W-19 and W-20: The mouth of Endicott River, which forms the gateway to the Endicott River Wilderness with outstanding scenic values consisting of precipitous side walls, narrow gorges, and high mountains.

Links W-13 and W-14: Short sections of coastline and the west side of Lynn Canal, north of Sullivan Rock. The distinctive deep canyons, cliffs, and river channel of the valley opening onto the West Lynn Canal shore near Sullivan Rock.

Links W-6, W-7, and W-8: The valley holding the southern arm of Davidson Glacier, north of Sullivan Mountain on the west side of Lynn Canal.

3.1.2.1.3 Alternatives 4B and 4D

The highway segments of these alternatives do not contain variety class A landscapes.

3.1.2.2 Variety Class B – Common for all Highway Segments of Alternatives Considered

Most of the remaining Forest Service land within the VSOI is rated by the Forest Service as variety class B landscapes, characterized by landform with slopes from 30 to 60 percent, moderately dissected (by small drainages) or undulating. Vegetation in these areas typically is continuous with some interspersed patch patterns. Water forms have some shoreline irregularity, with common meandering and flow characteristics. These areas often form an integral part of the larger setting in which variety class A features are viewed.

The eastern edge of Berners Bay and areas within Point Bridgett State Park as well as all areas along the Taiya Inlet are typical variety class B landscapes within the VSOI.

3.1.2.3 Variety Class C – Common for all Highway Segments of Alternatives Considered

Variety class C landscapes occupy a very small portion of the VSOI, and are limited to areas with no dominant landform features, exhibiting very little diversity, and continuous vegetative cover with little or no pattern. A few small areas of variety class C can be found along the East Lynn Canal Highway Alternative (e.g., the mining area north of Berners Bay within the vicinity of Links E-26 and E-27), and a small area of flat ground with uniform vegetation canopy along the West Lynn Canal Highway Alternative (i.e., Link W-14).

Table 6 presents acres of variety classes along the alternative corridors. Figure 2 illustrates variety classes traversed by the proposed alternatives.

Table 6
Variety Classes Traversed by the Alternatives (acres)

Alternative	Forest Service Variety Class A	Variety Class A	Forest Service Variety Class B	Variety Class B	Forest Service Variety Class C	Variety Class C
Alternative 1 – No Action	Not Applicable					
Alternative 2 – East Lynn Canal Highway with Katzeihin Terminal	743	210	2,886	1,081	0	0
Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttle	548	161	2,499	1,033	0	0
Alternative 2B – East Lynn Canal Highway to Katzeihin, shuttles to Haines and Skagway	731	214	2,018	676	0	0
Alternative 2C – East Lynn Canal Highway with shuttle to Haines from Skagway	Same as Alternative 2					
Alternative 3 – West Lynn Canal Highway	561	666	1,069	469	45	0
Alternative 4A – FVF shuttle from Auke Bay	Not Applicable					
Alternative 4B – FVF shuttle from Sawmill Cove	59	15	134	199	0	0
Alternative 4C – Conventional monohull shuttle from Auke Bay	Not Applicable					
Alternative 4D – Conventional monohull shuttle from Sawmill Cove	Same as Alternative 4B					

3.1.3 Existing Visual Conditions

Most of the project area is undisturbed visually whether on Forest Service or non-forest lands. Most of the Forest Service land has been classified as existing visual condition Level I. However, within the Tongass National Forest there are several small areas of Level III (i.e., Link W-14). In addition, few Level II areas occur near Comet (Link E-24), areas with existing access at Echo Cove (Link E-36), and the settlement areas of Haines and Skagway.

3.1.3.1 Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highway Alternatives

All land, whether Forest Service or non-forest lands, along this alternative has existing visual conditions of Level I or Level II. The overall existing visual setting consists of predominantly unmodified natural landscapes. Two primary areas of exception to this would include Echo Cove (Link E-36) and Skagway (Link E-1). Echo Cove has an existing visual condition Level I, although there are subordinate modifications to the existing setting related to the recreation area and nearby organizational facilities. Skagway has an existing visual condition Level II given the co-dominant level of development that has occurred within this community. Several unnoticeable cabins also occur along this alternative as well as navigational beacon facilities, but these modifications do not substantially change the overall existing setting appreciably.

3.1.3.2 Alternative 3 – West Lynn Canal Highway Alternative

Existing visual conditions along this alternative are primarily Level I. Three areas of Level III were identified along this alternative—portions of land along Links W-1, W-9, W-10, and W-19. Similar to Alternative 2, the existing visual setting along this alternative consists of predominantly unmodified natural setting. The most noticeable modifications occur on the west coastline of the Chilkat Peninsula in the vicinity of Haines. However, these modifications (i.e., residential areas, roads) do not substantially modify the overall existing setting.

3.1.3.3 Alternatives 4B and 4D

The existing visual conditions (EVCs) along the highway segments of these alternatives are identical to those described under Alternative 2 within the vicinity of Echo Cove.

Table 7 presents acres of EVC along the proposed highway corridors. See Figure 2 for an illustration of EVC along the proposed alternatives.

Table 7
Existing Visual Conditions Traversed by the Alternatives (acres)

Alternative	Forest Service Level I	Level I	Forest Service Level II	Level II	Forest Service Level III	Level III	Levels IV, V, and VI
Alternative 1 – No Action	Not Applicable						Not within VSOI
Alternative 2 – East Lynn Canal Highway with Katzeihin Terminal	3,558	1,291	71	0	0	0	
Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttle	2,977	1,194	71	0	0	0	
Alternative 2B – East Lynn Canal Highway to Katzeihin, shuttles to Haines and Skagway	2,700	891	59	0	0	0	
Alternative 2C – East Lynn Canal Highway with shuttle to Haines from Skagway	Same as Alternative 2						
Alternative 3 – West Lynn Canal Highway	1,196	1,122	0	5	479	9	
Alternative 4A – FVF shuttle from Auke Bay	Not Applicable						
Alternative 4B – FVF shuttle from Sawmill Cove	193	214	0	0	0	0	
Alternative 4C – Conventional monohull shuttle from Auke Bay	Not Applicable						
Alternative 4D – Conventional monohull shuttle from Sawmill Cove	Same as Alternative 4B						

3.2 Visual Priority Travel Routes, Use Areas, and Land Use Designations

As stated previously, the sensitivity of all viewers along all the proposed alternative routes has been characterized as high on both Forest Service and non-forest lands. The basis for this determination is a factor of the high visual quality present within the VSOI and the potential for noticeable changes to occur within the foreground and middleground thresholds. Further, the basis for this determination is a factor of the likelihood of noticeable changes occurring in the background threshold, the overall pristine and unmodified natural setting, as well as consideration of management objectives within the TLMP and the Haines, Juneau, and Skagway Coastal Management Programs. The following sections describe areas most susceptible to potential visual impacts from the proposed alternatives.

3.2.1 Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highway Alternative

Along this alternative the key visual priority travel routes and use areas include:

- All marine and highway travel routes within foreground and middleground views of the coastline.

- All areas within Berners Bay (i.e., Links E-36 through E-28) that include, for example, users on trails at Echo Cove, Point Bridgett State Park, resort and camp areas, fishermen, views from existing cabins, and views from small boats.
- Areas within the foreground and middleground-viewing threshold of the East Lynn Canal Highway coastline. (i.e., Links E-27 through E-8) that include, for example, viewers from state parks, cabins, tourist, and visitors to Eldred Lighthouse.
- Areas within the middleground-viewing threshold of state recreation facilities (Links E-36, E-20 through E-8).
- The mouth of the Katzeihin River (i.e., Links E-10 and E-11).
- Background views from Haines (i.e., Links E-8 through E-12).
- All areas adjacent to the Taiya Inlet (i.e., Links E-8 through E-1).
- Foreground and middleground views from Skagway and the Dyea Inlet (i.e., Links E-6 through E-1).

3.2.2 Alternative 3 – West Lynn Canal Highway Alternative

Along this alternative the key visual priority travel routes and use areas include:

- All marine and highway travel routes within foreground and middleground views of the coastline. Background views from cruise ships and ferries.
- Forest Service and non-forest lands within William Henry Bay (i.e., Link W-22).
- The mouth of the Endicott River (i.e., Links W-19 and W-20).
- Areas of land on the west side of Sullivan Island (i.e., Links W-14 through W-10).
- The mouth of Davidson Glacier (i.e., Links W-6 through W-8).
- Developed areas on the west side of the Chilkat Peninsula (i.e., Links W-1 through W-8).

3.2.3 Alternatives 4B and 4D

Along these alternatives, key visual priority travel routes and use areas include those identified under Alternative 2 along Links E-34, E-35, and E-36 as well as all other areas within Berners Bay.

Figure 3 identifies visual priority travel routes and use areas as well as other important viewpoints within the VSOI that were inventoried along the proposed alternative routes.

3.3 Project Visibility and Factors Influencing Visibility

The results of this inventory identified seen and unseen areas from the alternatives being considered. It is important to note that although a viewpoint may be within the field of vision of the highway, other variables were considered (e.g., visual absorption capabilities, existing visual conditions, concern level, variety classes) that identified areas/viewers most susceptible to seeing the highway. The following paragraphs describe the visibility analysis conducted for this study.

The first step in performing a viewshed analysis for the Juneau Access Improvements Project required digital terrain models for an area extending a sufficient distance from each alternative. To meet this requirement, USGS 15-minute Digital Elevation Models (DEMs) for the project area

were obtained from the Alaska Geospatial Data Clearinghouse. The DEMs were projected into the Eldred Grid 2003 projection system as specified for the project. These DEMs were then merged to form a comprehensive terrain model of the project area. The project terrain model retained the native 155-foot cell size used by the original 15-minute DEMs. In this process a data gap was identified for a small area of the Chilkat Peninsula and a small portion of the east shoreline of the Chilkoot Inlet. The data gaps were filled using interpolation from USGS 15-minute quadrangle maps.

The second step required breaking each alternative centerline into 1/10-mile increments. This was done by increasing the vertex density of the centerlines to a minimum of 1/10 mile while retaining those vertices necessary to define the centerline. Next, the ArcInfo visibility analysis routine was used to generate a grid of values ranging from zero to the maximum number of vertices for the centerline. The visibility of each grid point is determined by comparing the altitude angle to the grid point with the altitude angle to the local horizon. The local horizon is computed by considering the intervening terrain between the point of observation and the current grid point. If the point lies above the local horizon it is considered to be visible. To perform this analysis it was assumed that the height of the observer was 5.5 feet above terrain surface, the height of the highway is 1 foot above terrain surface, and the maximum view distance is 16 miles. The resultant viewshed grid was clipped to the extent of the VSOI for this study.

The visibility analysis was conducted for all alternatives that include highways. The visibility analysis for the East Lynn Canal Highway Alternatives combine Alternatives 2, 2A, 2B, 2C, 4B, and 4D. The West Lynn Canal Highway Alternative visibility includes extending Glacier Highway to the Sawmill Cove Ferry Terminal. The No Action (Alternative 1) and Alternatives 4A and 4C were not assessed for visibility because they are entirely marine routes that would not alter visibility and viewing conditions.

Increased ferry service related to all marine alternatives would increase the frequency of on- and off-shore viewers seeing these vessels more frequently.

Figures 4 and 5 illustrate the extent of visibility along the proposed alternatives.

3.3.1 Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highway Alternative

Visibility along this alternative is extensive and far reaching. However, there are a few areas that require further discussion. Along the entire east coastline of Lynn Canal, visibility is substantially truncated at the ridge line of the Kakuhan Mountain Range. Intermittent areas of visibility do occur in glacier and river valleys, but typically visibility is reduced. Conversely, within the background distance zone along the west coastline of Lynn Canal, visibility is increased slightly due to factors such as less severe topography and wider glacier and river valleys. Additionally, an area west of Sullivan Island is screened from this alternative as well as the west side of the Chilkat Peninsula. Further along the Taiya Inlet west of the Halutu Ridge this alternative is screened by topography.

3.3.2 Alternative 3 – West Lynn Canal Highway Alternative

Similar to Alternative 2, visibility along this alternative is extensive and far reaching. Yet, as with Alternative 2, there are areas that require further discussion. The confluence of Berners, Lace, and Antler rivers is screened by the Kakuhan Mountain Range. Similar to the truncation of visibility along Alternative 2, the Kakuhan Mountain Range screens a large area in the background distance threshold. Additionally the east side of the Chilkat Peninsula and the

Katzehin River would be screened. Further, the northern two-thirds of the Taiya Inlet beginning around Schubee Mountain would be within the unseen area of the VSOI for this alternative.

3.3.3 Alternatives 4B and 4D

Visibility along these alternatives is identical to that described along Links E-34, E-35, and E-36 for Alternatives 2, 2A, 2B, and 2C.

Table 8 identifies the acres of seen and unseen land Forest Service and non-forest areas. Total acres represent acres potentially seen or unseen out to 4 miles from either side of Lynn Canal.

Table 8
Visibility along Lynn Canal (acres)

Lynn Canal	Forest Service Acres Seen	Acres Seen	Forest Service Acres Unseen	Acres Unseen	Forest Service Total Acres VSOI	Total Acres VSOI
East Lynn Canal Highway	130,784	232,464	131,288	5,0871	262,072	283,335
West Lynn Canal Highway	103,043	181,082	159,029	102,253		

Note: VSOI = Visual Sphere of Influence

3.4 Visual Absorption Capability Levels

Generally speaking, visual absorption capability levels along the East Lynn Canal Highway Alternatives are less likely to absorb the highway than that of the West Lynn Canal Highway Alternative. This is primarily due to nearly continuous forested canopy coupled with areas of extreme slope. The West Lynn Canal Highway Alternative occurs in an area with less severe topography and low-lying mud flats that provide screening and reduced landform modifications resulting from construction related activities. Following is a discussion of visual absorption capability along the proposed alternative routes that includes both Forest Service and non-forest lands. It should be noted that the visual absorption capability analysis accounted for a 600-foot-wide swath of land along the proposed alternative routes. This distance was selected for two primary reasons: (1) it coincides with the immediate foreground distance zone utilized for this study of 300-feet per side of an assumed centerline, and (2) it provides for variability in the actual constructed highway. Depending on where the final alignment is constructed visual absorption capability levels would vary within this corridor.

3.4.1 Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highway Alternatives

Visual absorption capability along this alternative ranges from areas of very high to very low. Within Berners Bay, visual absorption capability was characterized as very high to intermediate high from Echo Cove to just north of Sawmill Cove (i.e., Links E-36 through E-33). This characterization is based primarily on more gentle slopes coupled with a continuous homogeneous vegetation cover. From Link E-33 to Link E-31 the visual absorption capability was characterized as intermediate to very low based on steeper terrain. From Link E-31 to Link E-30, the visual absorption capability was rated intermediate to very low because of a more open and exposed flatland, and because of river crossings that are unable to absorb the highway to a noticeable degree. From Link E-30 through E-23 (in the vicinity of

Comet), the visual absorption capability was rated as very high primarily because of more level terrain coupled with a homogeneous vegetative cover. North from Link E-23 to Skagway (Link E-1) the visual absorption capability was rated very low to intermediate based on very steep terrain and an intermittent vegetative cover.

3.4.2 Alternative 3 – West Lynn Canal Highway Alternative

Visual absorption capability along this alternative is substantially higher than along Alternative 2. This is based primarily on the presence of less steep slopes within a nearly continuous homogeneous vegetation cover. Additionally, wider river and glacier headwater areas occur along this alternative than are present along Alternative 2. Generally speaking, from the entrance to William Henry Bay through to Pyramid Harbor (i.e., Links W-22 through W-3) the visual absorption capability has been characterized as very high to intermediate. The crossing of Chilkat Inlet (i.e., Links W-3 through W-1) has been characterized as very low as a factor of a proposed multi-span bridge occurring in this area.

3.4.3 Alternatives 4B and 4D

Visual absorption capability along these alternatives is identical to Links E-34, E-35, and E-36 for Alternative 2.

Table 9 identifies acres of visual absorption capability inventoried along the proposed alternative routes. Figure 6 illustrates the visual absorption capability levels inventoried along the proposed alternative routes on both Forest Service and non-forest lands.

3.5 Visual Quality Objectives

A large portion of the Tongass National Forest (within the VSOI) was designated by the Forest Service as Partial Retention VQO, resulting from variety class B, high sensitivity (Level I and Level II) viewpoints, and foreground or middleground viewing distance opportunities. The TUS LUD has an adopted VQO of modification within the foreground viewing threshold. The following sections describe VQOs adjacent to the TUS LUD proposed alternatives.

3.5.1 Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highway Alternatives

- Links E36 through E29 – Adopted VQO of Retention adjacent to the TUS LUD
- Links E29 through E23 – Adopted VQO of primarily Modification adjacent to the TUS LUD
- Links E23 through E11 – Adopted VQO of Partial Retention adjacent to the TUS LUD
- Link E11 – Adopted VQO of primarily Retention adjacent to the TUS LUD
- Links E11 through E-3 – Adopted VQO of Partial Retention adjacent to the TUS LUD

Table 9
Visual Absorption Capability Levels (acres)

Alternative	Forest Service Very High	Very High	Forest Service High/Intermediate	High/Intermediate	Forest Service Intermediate	Intermediate	Forest Service Intermediate/ Low	Intermediate/Low	Forest Service Very Low	Very Low	Total Acres
Alternative 1 – No Action	Not Applicable										
Alternative 2 – East Lynn Canal Highway with Katzeihin Terminal	764	640	630	246	1,112	196	408	46	715	163	4,919
Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttle	671	610	513	240	850	180	369	44	645	120	4,241
Alternative 2B – East Lynn Canal Highway to Katzeihin, shuttles to Haines and Skagway	713	434	540	164	876	126	242	28	388	138	3,650
Alternative 2C – East Lynn Canal Highway with shuttle to Haines from Skagway	Same as Alternative 2										
Alternative 3 – West Lynn Canal Highway	1,109	547	348	180	197	214	1	10	20	185	2,810
Alternative 4A – FVF shuttle from Auke Bay	Not Applicable										
Alternative 4B – FVF shuttle from Sawmill Cove	90	43	70	99	27	39	4	8	1	25	407
Alternative 4C – Conventional monohull shuttle from Auke Bay	Not Applicable										
Alternative 4D – Conventional monohull shuttle from Sawmill Cove	Same as Alternative 4B										

3.5.2 Alternative 3 – West Lynn Canal Highway Alternative

- Links W22 through W20 – Adopted VQO of primarily Partial Retention with a small portion of Retention within William Henry Bay.
- Links W20 through W19 – Adopted VQO of Retention adjacent to the TUS LUD
- Links W19 through W15 – Adopted VQO of Partial Retention adjacent to the TUS LUD
- Link W14 – adopted VQO of Retention
- Links W13 through W10 – adopted VQO of Modification
- Link W10 – adopted VQO of Partial Retention adjacent to the TUS LUD

3.5.3 Alternatives 4B and 4D

VQOs along these alternatives are identical to those characterized along Links E-34, E-35, and E-36 for Alternative 2 (i.e., Retention VQO).

Table 10 identifies acres of VQO within the VSOI. Figure 7 illustrates all VQOs within the VSOI.

Table 10
Visual Quality Objectives in the VSOI

VQO	Acres
Retention	96,988
Partial Retention	115,535
Modification	35,130
Maximum Modification	12,073

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4.0 ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

4.1 Methodology

The purpose of this chapter is to describe potential effects on visual resources that may result from construction, operation, and maintenance of the project alternatives. Potential impacts that may result were determined by comparing the proposed alternatives to the affected environment. Once impacts were determined on Forest Service lands, VQOs were compared with the resultant impact levels and a determination related to VQO compatibility for the TUS LUD as well as the adjacent LUDs was made. The VQO compatibility analysis was not conducted on non-Forest Service lands as VQOs do not apply there and coastal zone enforceable policies have not been developed to allow a compatibility analysis.

Potential direct impacts are described as low, moderate, high, or very high. Potential direct impacts are discussed in the following sections pertaining to sensitive viewers within the VSOI at varying distance zones. Potential direct impacts on visual quality are confined to areas within the 600-foot-wide corridors along the highway segments of project alternatives. Compatibility with Tongass National Forest VQOs and visual simulations are discussed and presented at the end of this section.

For alternatives that have marine portions (not including bridges) associated with all or part of the alternative, potential impacts on visual quality can neither be qualified nor quantified because no ground-disturbing activities would occur; therefore, visual quality would not be affected.

As stated in the previous section, the visual resources study was based on criteria used in the Forest Service VMS with the implementation of the visual absorption capabilities methodology. Further, visual simulations of representative key viewing areas were developed as a method to illustrate what the project might look like upon completion of construction-related activities, as well as to verify the accuracy of the visual resources impact prediction models.

In accordance with the Forest Service Scenery Management System (Forest Service, 1995), the prediction models related to impacts on visual quality accounted for a 600-foot-wide swath of land centered on the alignment of the proposed alternatives. This area encompasses the immediate foreground (0 to 300 feet) of the alignment which is the most sensitive viewing threshold. Depending on where the final alignment is constructed potential impacts would vary within this corridor.

4.1.1 Evaluation Criteria

Direct impact levels were assigned values ranging from 1 through 9 within the impact prediction models. These nine levels were then grouped into four impact categories defined by the following impact evaluation criteria:

- Very High Impact (Level 9) – A very high level of impact would result if the construction, operation, or maintenance of the highway potentially would cause a substantial adverse change on visual resources.
- High Impact (Levels 8 and 7) – A high level would cause an adverse change on visual resources.
- Moderate Impact (Levels 6, 5, and 4) – A moderate level would cause some change on visual resources.

- Low Impact (Levels 3, 2, and 1) – A low impact would cause an insignificant or small change on visual resources.

Table 11 describes the relationship between an assigned impact level and the compatibility of the highway with adopted VQO.

Table 11
Compatibility Matrix

Impact Level	Visual Quality Objectives			
	Retention	Partial Retention	Modification	Maximum Modification
Very High	No	No	NC ^a	Yes
High	No	NC	Yes	Yes
Moderate	NC	Yes	Yes	Yes
Low	Yes	Yes	Yes	Yes

Note: ^aMay or may not be compatible with adjacent VQO depending on final design features.

Visual resources potentially affected along the proposed alternatives typically would receive direct and long-term impacts (i.e., greater than 5 years). The Impact Prediction Model (IPM) was organized into several theme sets. Each set focused on a specific resource potentially affected by the highway. These theme sets are described below:

- Theme 1 – Travelways (e.g., trails, cruise ships and small boat routes, primary and secondary roadways, White Pass and Yukon Route Railroad)
- Theme 2 – Key Viewpoints (e.g., cabins, campgrounds, anchorages, public and private resorts, Eldred Rock Lighthouse)
- Theme 3 – Key Viewing Areas (e.g., Skagway, Haines, Berners Bay, Chilkat State Park, Chilkat Marine State Park, Sullivan Island)
- Theme 4 – Congressionally Designated or Proposed for Designation Special Management Areas (e.g., Endicott River Wilderness, Skagway and Whitehorse Historic Districts of the Klondike Gold Rush National Historic Park, Katzeihin River)
- Theme 5 – Visual quality

Once potential direct impacts were modeled, an evaluation related to compatibility with Forest Service VQOs was conducted as well as an assessment related to enforceable policies found within the Haines, Juneau, and Skagway Coastal Management Programs (i.e., Theme 6).

4.1.2 Impact Prediction Models

The following sections describe the visual resources IPM that were used to determine the magnitude or severity of impact on visual resources along the proposed alternatives. In the analysis of impact levels, visual absorption capabilities, visibility (e.g., distance zones), viewer concern (i.e., visual priority travel routes and use areas), variety classes (including existing visual conditions) coupled with the project description were considered the primary variables factored into the impact assessment.

4.1.2.1 Sensitive Viewers Impact Prediction Model

As stated in the previous chapter, the identification of visual absorption capability levels is a direct function between the interrelationship of landcover, and slope. Once visual absorption capability levels were established within the delineated 600-foot-wide corridors, potential direct impacts on viewer theme sets (i.e., Themes 1 through 4) were calculated at the following distance zones as suggested by the Tongass National Forest:

- Immediate foreground – 0 to 300 feet
- Foreground – 300 feet to 0.5 mile
- Middleground – 0.5 mile to 4 miles
- Background – beyond 4 miles

Table 12 presents the IPM used to quantify impact levels on sensitive viewers along the proposed alternatives. Generally speaking, sensitive viewers identified during the visual resources inventory were considered related to the distance the viewer is from the highway and the ability of the landscape to absorb modifications.

Table 12
Sensitive Viewers Impact Matrix^a

VAC Level	Distance Zones			
	0 to 300 feet	300 to 0.5 mile	0.5 mile to 4 miles	Beyond 4 miles
Very Low	9	8	7	6
Intermediate/Low	8	7	6	5
Intermediate	7	6	5	4
Intermediate/High	6	5	4	3
Very High	5	4	3	2

Note: ^aImpact intensity based on a scale from 2 to 9, with 2 considered to be a very low impact and 9 a very high impact.

VAC: visual absorption capability

4.1.2.2 Visual Quality Impact Prediction Model

The visual quality modeling effort was not as complex as the modeling effort associated with potential impacts on sensitive viewers. Once variety classes were identified, relationships were developed between visual absorption capability levels and variety classes, the results of which derived potential direct impacts on visual quality. Table 13 defines the matrix used to derive potential impacts on visual quality.

Table 13
Visual Quality Impact Matrix^a

Variety Class	Visual Absorption Capability Levels				
	Very Low	Intermediate/Low	Intermediate	Intermediate/High	Very High
A	9	8	7	6	5
B	8	7	6	5	4
C	7	6	5	4	3

Note: ^aImpact intensity based on a scale from 3 to 9 with 3 being a very low impact and 9 being a very high impact.

4.2 Impact Assessment Results

The following sections identify potential direct impacts from the proposed alternatives. Both a qualitative discussion (a narrative discussed by “link”) and a quantitative discussion (results of the IPM) of impacts are provided. Refer to Attachment A at the end of this report for photographic simulations of highway segments and ferry terminals of the project alternatives. Refer to the figures at the end of the document for impact maps associated with resource themes (as discussed previously), which reflect a composite of that specific theme. Included within the impact maps are graphic pie charts that show the similarities and differences of the alternative variations considered, primarily associated with Alternatives 2 through 2C. Additionally, a sensitive viewer’s composite map for each proposed alternative and an associated pie chart describing a composite for a specific alternative is provided. Tables that identify acres affected of specific resources within each theme set are included within this section.

Regarding the marine portion of the proposed alternatives, potential impacts would not occur on visual quality. A qualified impact analysis was conducted to disclose increased occurrences of ferries within existing viewsheds. As for the marine alternatives (i.e., 4A, 4B, 4C, and 4D), potential impacts associated with Alternatives 4B and 4D have been combined and discussed together as these potential impacts would be identical. The only substantive variation between these two alternatives is the type of ferry used, which would not substantially affect potential impacts on sensitive viewers or on visual quality. Further, related to Alternative 2 and 2C, discussion of these potential impacts are combined because the highway segments of these alternatives are identical.

4.2.1 Alternative 1: No Action Alternative

No impacts would occur on visual resources.

4.2.2 Alternatives 2, 2A, 2B, and 2C: East Lynn Canal Highway – Qualitative Visual Impact Assessment

Where impacts are common to all East Lynn Canal Highway alternatives (i.e., 2, 2A, 2B, 2C, 4B, and 4D), only the generic East Lynn Canal Highway Alternative is discussed. When impacts are specific to a particular alternative, these impacts are discussed independently.

4.2.2.1 Links E-1 and E-2

Views most susceptible to potential impacts along these links include the following:

- Views from Skagway/Whitehorse Historic Districts
- Views from White Pass and Yukon Route Railroad
- Views from residences within valley bottom and on hillsides
- Views from Upper Dewey Lake
- Views from Sturgill Landing Day Use Area
- Views from tourists on ferries and views from small boats
- Views from hikers on trails
- Views from travelers along both Dyea Road and the Klondike Highway

The inherent visual quality of the existing setting can be characterized as variety class B. Adjacent Forest Service lands surrounding Skagway to the east have a VQO of Partial Retention. Visual absorption capabilities within proximity to the Dewey Lake area have been characterized between very high and very low. It is likely that very high impacts would occur on sensitive viewers and on visual quality along most all of the highway alignment within the foreground-viewing threshold of Skagway proper. Moderate potential impacts on sensitive viewers and on visual quality, as a result of a higher visual absorption capabilities, are likely south and through the Dewey Lake area.

Four photographic simulations have been developed from this area: ELVP1, ELVP1.5, ELVP2, and ELVP3. ELVP1 was developed from within the Dyea Inlet. The existing landscape setting is unique as flatland dominates the foreground-viewing threshold. Middle-ground views include overlapping rounded hills within a continuous closed-canopied forest. Background views include snow-covered Mount Villard. The existing Dyea Road is evident within this viewshed but not considered a dominant feature. This area is used extensively by outfitters and guides either hiking or horseback riding with tourists spending time in Skagway. Unlike the Skagway area, it is quite remote and offers opportunities for visitors to experience solitude.

From ELVP1, the highway would be located approximately 2.5 to 3 miles from this viewpoint. Although not substantially dominating the natural setting, the highway would be noticeable as a ribbon along Taiya Inlet. Form and texture changes are not as noticeable as line and color contrast created by exposing subsoil and rock and through physical landform modifications. These changes could create a noticeable linear feature for several miles along the inlet.

ELVP1.5 was taken from a scenic pullout along Dyea Road above Skagway. Impacts associated with this portion of the highway would range from high to very high. As such the highway may become a dominant feature within the existing viewshed. However, the existing natural setting can also be considered as dominating the viewshed and may become the primary focal feature over the proposed highway.

The simulated viewpoint at ELVP2 occurs within the foreground-viewing threshold of the highway within the vicinity of the Skagway Airport. The topography within this area is very steep and covered by a continuous forested canopy. Large and continuous cuts are anticipated, which would create a distinct linear feature within the existing setting. It is likely that this portion of the highway would create sufficient changes to the form, line, color, and texture natural characteristics, which may result in the highway co-dominating this viewshed.

From ELVP3, the highway would be sited within immediate foreground and foreground-viewing thresholds. Middleground views would be intermittent at the northern portions of Skagway. Background views, even from within Taiya Inlet approaching Skagway, would be screened by topography from both the northern portions of Skagway and south of Link E-3. From superior viewing locations at Upper Dewey Lake and other surrounding higher hills and mountains, the highway would be highly noticeable. As with ELVP1, the lighter color contrast would be noticeable and may co-dominate viewsheds within this moderately developed area given the close proximity of the highway to viewers and the linear nature of the highway ascending into this confined valley. Further, tour ships and other human influences (i.e., the Skagway Airport) detract from the overall existing natural setting.

4.2.2.2 Links E-3 Through E-8

Views most susceptible to potential impacts along these links include:

- Views from the Dyea Inlet
- Views from Sturgill Landing Recreation Area and associated trails
- Views from tourists on ferries and small boats
- Views from hikers on trails

The inherent visual quality of the existing setting can be characterized as variety class B. Adjacent Forest Service lands have a VQO of Retention, whereas non-forest lands are not affected. Visual absorption capabilities along these links have been characterized as very low given the very steep topography and nearly homogeneous vegetative cover. It is likely that high to moderate potential impacts would occur on sensitive viewers and on visual quality along most of this portion of the corridor.

One photographic simulation has been developed along the Taiya Inlet (ELVP4). This viewpoint represents a characteristic viewpoint from a traveler along Taiya Inlet. From this viewpoint the highway would be sited approximately 60 to 80 feet above the water surface. Additionally, travelers within Taiya Inlet have both foreground perpendicular views of the highway as well as forced enclosed focal views in the middleground and background-viewing thresholds. Within this inlet the highway would dominate the existing setting in foreground and middleground thresholds and be co-dominant within the background threshold. The basis for this conclusion is a result of line and color contrast occurring in a natural setting within a confined area.

4.2.2.3 Links E-9 Through E-10

Views most susceptible to potential impacts along these links include:

- Views from Haines
- Views from Chilkat State Park
- Views from Portage Cove Campground
- Views from tourists on ferries and views from small boats

The inherent visual quality of the existing setting can be characterized as variety class B. Adjacent Forest Service lands have a VQO of Partial Retention, whereas non-forest lands are not affected. Visual absorption capabilities along these links have been characterized as ranging between intermediate high to intermediate primarily based on the opportunity of the highway to be constructed on less steep terrain coupled with nearly homogeneous yet intermittent vegetative cover. Some areas along this portion of the alternative have been rated for visual absorption capability as very low based on more steep terrain and a nearly homogeneous vegetative cover. It is likely that primarily moderate impacts would occur on sensitive viewers and on visual quality along most all of this portion of the corridor.

One photographic simulation was developed in the background-viewing threshold from Haines (ELVP5). From this viewpoint, the highway would create a linear band across an unmodified setting. The highway would be sited 60 to 80 feet above the water surface in a closed-canopied forest. The existing natural setting, which includes views of Mount Villard, dominates the viewshed. It is anticipated that the light linear band created by exposing subsurface soil

and rock may be noticeable at this distance, but not compete substantially with the existing setting.

4.2.2.4 Links E-10 Through E-11

Views most susceptible to impact along these links include:

- Views from Haines
- Views from Portage Cove Campground
- Views from tourists on ferries and views from small boats
- Views from shoreline cabins
- Views from visitors within the Katzeihin River Valley (proposed wild and scenic river by the Forest Service)

The inherent visual quality of the existing setting can be characterized as variety class B (Link E-10) and variety class A (Link E-11). Adjacent Forest Service lands have a VQO of Partial Retention (Link E-10) and Retention (Link E-11), whereas non-forest lands are not affected. Visual absorption capabilities along these links have been characterized as ranging between intermediate and very low based on the opportunity of the highway to be constructed across flat areas with a diversity of vegetation types along portions of Link E-10, yet very low at the actual crossing of the Katzeihin River. The proposed Katzeihin Ferry Terminal would be sited within an area where visual absorption capabilities is intermediate. It is likely the ferry terminal would be noticeable at close distances producing a moderate level of impact. For the remainder of the corridor, it is likely that moderate to very high impacts would occur on sensitive viewers and on visual quality.

Two photographic simulations were developed within the middleground-viewing threshold (ELVP6 and ELVP7) in this area. From ELVP6 the highway would be within the middleground-viewing threshold. From this distance the highway would appear as a linear band along the base of Mount Villard, along Link E-10. Topography along this link is very steep and vegetation intermittent. As a result, cut-and-fill areas would be highly noticeable. The proposed ferry terminal would be noticeable related to an interruption in the line associated with the roadway, but considered a subordinate feature within the natural setting. The existing setting dominates viewsheds and it is likely the highway would become a co-dominant feature in relationship to the existing setting. The proposed bridge crossing the Katzeihin River, from this viewpoint, would be subordinate within the existing viewshed.

From ELVP7, a viewer traveling within the Chilkoot Inlet within the vicinity of the Katzeihin River would likely notice a co-dominant linear band created by exposing lighter soils as well as a more subordinate bridge spanning the river headwater. Although the proposed bridge would be noticeable, the scale of both landform and vegetation modifications is less than that of cut-and-fill areas constructed on mountain slopes. Southbound travelers would not notice this portion of the highway to the same degree as northbound travelers approaching the river mouth. This is based on the forced focal point perspective that occurs as the inlet turns to a more northwesterly direction than a northern direction. Both the bridge and the highway would be noticeable to the northbound traveler, more so than the southbound traveler. Given the dominant natural features within the viewshed at this distance, it is likely the highway would be a co-dominant feature within the existing natural setting.

4.2.2.5 Links E-12 Through E-19

Views most susceptible to potential impacts along these links include:

- Views from Chilkat State Park
- Views from Chilkat Marine State Park
- Views from tourists on ferries and views from small boats

The inherent visual quality of the existing setting can be characterized as variety class C (east of Links E-14 and E-15), variety class B, and variety class A (Link E-17). Adjacent Forest Service lands have VQOs ranging from Partial Retention and Retention (Link E-17) to maximum modification (east of Link E-16), whereas non-forest lands are not affected. Visual absorption capabilities along these links have been characterized as primarily intermediate to very low, given steeper terrain and nearly homogeneous vegetative cover. It is likely that primarily moderate levels of potential impacts would occur on sensitive viewers and slightly higher impacts on visual quality along most of this portion of the corridor.

4.2.2.6 Links E-20 Through E-22

Views most susceptible to potential impacts along these links include:

- Views from and around Eldred Rock Lighthouse
- Views from Sullivan Island and Sullivan Island State Marine Park
- Views from tourists on ferries and views from small boats

The inherent visual quality of the existing setting can be characterized as variety class B. Adjacent Forest Service lands have a VQO of Partial Retention, whereas non-forest lands are not affected. Visual absorption capabilities along these links have been characterized as intermediate high to very low (Links E-21 and E-22) given steeper terrain and nearly vertical rock faces coupled with homogeneous intermittent vegetative cover. It is likely that moderate to high levels of impacts would occur on sensitive viewers and on visual quality along this portion of the corridor.

One photographic simulation (ELVP8) was developed from this area. From this viewing distance, approximately 1.5 miles, a traveler within Lynn Canal would notice the highway primarily based on the strong linear feature introduced in an otherwise natural setting. Some portions of the roadway would be sited close to the waters edge, thus reducing visibility of this linear band. In other areas the highway would be sited 60 to 80 feet above the waters edge and traversing areas of extreme slope creating dominant shear-cut faces. The existing setting can be characterized as one that dominates viewsheds. However at close distances the highway would become a co-dominant feature within this area.

4.2.2.7 Links E-23 Through E-29

Views most susceptible to potential impacts along these links include:

- Views from hikers on trails and secondary roads in the vicinity of Comet
- Views from visitors at Slate Cove within Berners Bay
- Views from tourists on ferries and views from small boats

The inherent visual quality of the existing setting can be characterized as variety class B. Adjacent Forest Service lands have a VQO of Retention along Links E-23 to E-26, whereas non-forest lands are not affected. Visual absorption capabilities along these links have been characterized as very high to intermediate given more gentle terrain and homogeneous vegetative cover. The proposed Slate Cove Ferry Terminal would be sited in an area that affords partial screening from sensitive viewers entering the Lace, Berners, and Antler rivers. It is likely that moderate to low levels of impact would occur on sensitive viewers and moderate levels of impact on visual quality.

Three photographic simulations have been developed along this portion of the East Lynn Canal Highway Alternative (ELVP9, ELVP10, and ELVP11). ELVP9 was developed within the middleground-viewing threshold toward Links E-22 and E-23. The highway would traverse through very steep topography in an area interspersed with vegetation. A notable waterfall occurs in the viewshed as well as a noticeable rock slide. The highway would create a distinct line feature across the existing setting that would compete and detract from natural landscape features. This conclusion is primarily a factor of substantial cut-and-fill areas occurring within the existing viewshed. At this distance, it is likely that the highway would become a co-dominant feature in relationship with the existing natural setting along Link E-22, primarily.

A transition between landscape units occurs within the viewshed of ELVP9. Beginning within the vicinity of Link E-23, the landscape makes a transition between very steep topography (meeting the water's edge) interspersed with vegetation to less steep rolling hills (set back from the waters edge) within a more continuous closed-canopied forest. Along this portion of the highway, topography and vegetation would allow the roadway to not visually compete with the existing setting as severely as was discussed along Link E-22. However, it is likely the highway in this location and from this viewpoint would become a co-dominant feature within the existing natural setting.

The simulated view developed for ELVP10 occurs in the transition area previously discussed at Link E-23. The existing viewshed is quite unique within the VSOI as it affords viewing opportunities that contain foreground, middleground, and background layering of distinct landscape units. As a result of the highway being sited within an area of less steep topography, the visibility of cut-and-fill areas is reduced. However, the linear band created by the removal of vegetation would be noticeable primarily in the middle and foreground-viewing thresholds. It is likely the highway would become a co-dominant to subordinate feature within the existing natural setting.

The simulated view from ELVP11 occurs in the vicinity of the proposed Slate Cove Ferry Terminal within Berners Bay. The highway would traverse very gentle terrain in a continuous closed-canopied forest. Although visibility of cut-and-fill areas would be reduced as a factor of terrain characteristics, the removal of vegetation would create a distinct line across this small peninsula. Moreover changes to the natural rounded form characteristics would be noticeable from viewers viewing the highway at a perpendicular angle, as the roadway would create a distinct niche as it crests over the peninsula. The roadway is likely to become a subordinate feature within the existing natural setting.

However, and related to the proposed ferry terminal, a dominant feature would occur between the highway and the existing setting as a result of the closeness of the viewer (i.e., foreground) and the increased visibility of changes to form, line, color, and texture natural characteristics.

4.2.2.8 Links E-30 Through E-31

Views most susceptible to potential impacts along these links include:

- Views from visitors at Berners Bay
- Views from dispersed recreationists
- Views from hikers on trails and fishermen accessing Berners, Lace, and Antler rivers
- Views from Gilkey River (proposed for Wild and Scenic River designation by the Forest Service)
- Views from small boats
- Views from Point Bridgett State Park
- Views from cabins (e.g., Windfall Lake and Berners Bay)

The inherent visual quality of the existing setting can be characterized as variety class A. Adjacent Forest Service lands have a VQO of Retention, whereas non-forest lands are not affected. Visual absorption capability along these links has been characterized as intermediate based on more gentle terrain and a diversity of vegetation within lower lying areas. At two river crossings, visual absorption capabilities are considered very low as it relates to bridges being constructed over them. It is likely that high to very high levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor.

One photographic simulation was developed within this area (ELVP12). Viewers within Berners Bay primarily accessing the Lace, Antlers, and Berners rivers would notice the highway. As with the crossing of the Katzechin River, the strong linear band created by exposing lighter soil and rock in cut-and-fill areas would be most noticeable. The proposed bridge would create form contrast; however, depending on the angle of view as well as the distance, the bridge would be more or less noticeable. Steep road cuts on the eastern edge of Berners Bay would dominate the existing setting out to the middleground-viewing threshold, while the bridge would most likely become a co-dominant feature within this threshold, and possibly a subordinate feature. Whereas within the foreground threshold, the bridge and highway would dominate the existing setting.

4.2.2.9 Links E-32 Through E-33

Views most susceptible to potential impacts along these links include:

- Views from visitors at Berners Bay
- Views from dispersed recreationists
- Views from hikers on trails and fishermen accessing Berners, Lace, and Antler rivers
- Views from Gilkey River (proposed wild and scenic by the Forest Service)
- Views from small boats
- Views from Point Bridgett State Park
- Views from the vicinity of Berners Bay Cabin

The inherent visual quality of the existing setting can be characterized as variety class B. Adjacent Forest Service lands have a VQO of Partial Retention, whereas non-forest lands are not affected. Visual absorption capabilities along these links have been characterized as very

high to very low given steep slopes and a nearly homogeneous vegetative cover on the northern portion and very high to intermediate along the southern portions of Link E-33. A notable waterfall occurs along Link E-32. Additionally, the Berners Bay Cabin would be relocated as a result of the highway and considered a day use area. It is likely that moderate to very high levels of impact would occur on sensitive viewers and slightly lower impacts on visual quality for this portion of the corridor.

The simulated view from ELVP13 occurs just south of the confluence of the Berners, Lace, and Antler rivers on the east side of Berners Bay within proximity to the Berners Bay Cabin. Topography within this area varies from gentle to moderately steep. As a result, it is likely cut-and-fill areas would be intermittently visibly from this viewpoint. A distinct line created by the removal of vegetation would also be noticeable. The layering of landscapes surrounding primarily all but the central western portion of the bay dominates existing viewsheds and is considered by the Forest Service as a scenic viewshed land use designation. The distance a viewer is from the highway within Berners Bay would affect project dominance. From the distance simulated, however, the highway likely would become a co-dominant feature within the existing natural setting.

4.2.2.10 Links E-34 Through E-36

Views most susceptible to impact along these links include:

- Views from visitors at Berners Bay and an existing boat launch at Echo Cove
- Views from dispersed recreationists
- Views from small boats
- Views from cabins (e.g., Windfall Lake)
- Views from resorts/camps
- Views from hikers on trails within Point Bridgett State Park

The inherent visual quality of the existing setting can be characterized as variety class B. Adjacent Forest Service lands have a VQO of Partial Retention. Visual absorption capability along these links has been characterized as intermediate high to very high with a few areas of very low. The proposed Sawmill Cove Ferry Terminal would be sited within the foreground distance zone in an area concentrated with sensitive viewers. It is likely that mostly moderate levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor with a few areas of very high impact concentrated around the proposed ferry terminal location and along a portion of Link E-35.

Two photographic simulations were developed from the southern portions of Berners Bay (ELVP14 and ELVP15). The simulated view from ELVP14 occurs in the foreground view threshold of the proposed Sawmill Cove Ferry Terminal. The highway be noticeable intermittently along the eastern edge of Berners Bay as discussed previously related to ELVP13. The proposed ferry terminal, however, would likely be highly visible from this distance and through the middleground-viewing threshold. Changes to form, line, color, and texture natural characteristics would dominate the existing viewshed.

From ELVP15, the highway would be viewed at such a great distance and within an area not requiring substantial cuts and fills that the highway is not likely to dominate the existing natural setting substantially. At closer distances, the proposed ferry terminal and associated highway would be more noticeable. It is likely that visitors to Berners Bay, Echo Cove, and at Point Bridgett State Park would notice the highway; however, this condition is highly dependent on the

view distance as is described in simulation ELVP15 when compared to other simulations closer to the highway.

4.2.3 Alternatives 2, 2A, 2B, and 2C: East Lynn Canal Highway – Quantitative Visual Impact Assessment

Where impacts are common to all East Lynn Canal Highway Alternatives (i.e., 2, 2A, 2B, 2C, 4B, and 4D), only the generic East Lynn Canal Highway Alternative is discussed. When impacts are specific to a particular alternative, these impacts are discussed independently.

4.2.3.1 Direct Potential Impacts on Sensitive Viewers

4.2.3.1.1 Theme 1 – Travelways

Travelway impacts describe the visual effects of the highway as viewed by travelers along major and secondary travel routes.

Figure 8 illustrates potential impacts on Theme 1 viewers.

4.2.3.1.2 Theme 2 – Key Viewpoints

Input from the Tongass National Forest, municipal plans, and other secondary sources of data identified key viewpoints that could potentially be affected by the highway.

Figure 9 illustrates potential impacts on Theme 2 viewers.

4.2.3.1.3 Theme 3 – Key Viewing Areas

Key viewing areas include larger geographic areas sensitive to changes within respective viewsheds. Although not one single viewpoint is assessed as in the previous assessment (i.e., key viewpoints), a larger area is considered that accounts for dispersed and intermittent viewers within this area.

Figure 10 illustrates potential impacts on Theme 3 areas.

4.2.3.1.4 Theme 4 – Congressionally Designated or Considered for Designation Special Management Areas

These areas include congressionally designated places or areas being considered for designation. It should be noted that while these areas are afforded protection under federal law, adjacent visual impacts on lands undesignated are not afforded the same level of protection and are presented for information purposes only.

Figure 11 illustrates potential impacts on Theme 4 areas.

4.2.3.2 Summary of Impact Results on Sensitive Viewers

For the purposes of summarizing the four sensitive viewer impact themes (as presented above), Figure 12 accounts for all sensitive viewer theme sets along Alternatives 2, 2A, 2B, and 2C. These conclusions were based on the potential impact level calculated from the closest features to the highway within Themes 1, 2, and 3.

Figure 12 illustrates a composite of potential impacts on theme sets for Alternatives 2, 2A, 2B, and 2C.

4.2.3.3 Direct Potential Impacts on Visual Quality

Potential impacts on visual quality describe the change created by the highway within a specific setting. Impact levels were determined by comparing the existing variety class with the ability of the landscape to absorb changes (i.e., visual absorption capability) or increased visibility related to modifications to form, line, color, and textural elements that create the inherent aesthetic value of a particular landscape setting.

Table 14 discloses visual quality impacts on acres affected by Alternatives 2 through 2C.

Figure 13 illustrates potential impacts on visual quality for Alternatives 2 through 2C.

Table 14
Alternative 2 Impact on Visual Quality (acres)

Alternative	Very High Impact on Forest Service Land	Very High Impact on Non-Forest Service Land	High Impact on Forest Service Land	High Impact on Non-Forest Service Land	Moderate Impact on Forest Service Land	Moderate Impact on Non-Forest Service Land	Low Impact on Forest Service Land	Low Impact on Non-Forest Service Land
Alternative 2 – East Lynn Canal Highway with Katzeihin Terminal	82	90	1,365	158	2,181	1,043	0	0
Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttle Highway	62	48	1,132	146	1,854	1,000	0	0
Alternative 2B – East Lynn Canal Highway to Katzeihin, shuttles to Haines and Skagway	82	94	872	111	1,805	686	0	0
Alternative 2C – East Lynn Canal Highway with shuttle to Haines from Skagway Highway	Same as Alternative 2							

4.2.4 Alternative 3: West Lynn Canal – Qualitative Visual Impact Assessment

4.2.4.1 Links W-1 Through W-2

Views most susceptible to potential impacts along these links include:

- Views from residential areas in Haines and views from travelers along roadways
- Views from small boats
- Views from Chilkat State Park
- Views from cabins
- Views from resorts/camps
- Views from Haines State Forest Resource Management Area
- Views from hikers on trails within Chilkat State Park

The inherent visual quality of the existing setting can be characterized as variety class A. Related to VQOs, no Forest Service lands would be affected. Visual absorption capabilities along these links have been characterized as very low based on the inability of the

waterscape across Chilkat Inlet to absorb the highway to any degree. It is likely that high to very high levels of impact would occur on sensitive viewers for this portion of the corridor.

One photographic simulation (WLVP1) was developed from this area. From this viewpoint the multi-span bridge crossing the Chilkat Inlet would become a co-dominant feature within the natural/semi-modified setting. Unlike previous bridge crossings discussed (e.g., Katzehein and Berners Bay), which would be less noticeable in the middle-ground and background-viewing thresholds, this proposed crossing is of such a great scale and magnitude that even in the background threshold it may be noticeable, visibility increasing substantially as distance decreases. It is likely that within the foreground threshold this bridge would become a dominant feature in the natural setting.

4.2.4.2 Link W-3

Views most susceptible to potential impacts along this link include:

- Views from residential areas in Haines
- Views from travelers along roadways
- Views from small boats
- Views from Chilkat State Park
- Views from shoreline cabins
- Views from resorts/camps
- Views from hikers on trails within Chilkat State Park
- Views from Haines State Forest Resource Management Area

The inherent visual quality of the existing setting can be characterized as variety class A. Related to VQOs, no Forest Service lands would be affected. Visual absorption capabilities along these links have been characterized as very high based on a diversity of vegetation occurring on a relatively flat river inlet. It is likely that low to moderate levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor.

4.2.4.3 Links W-4 and W-5

Views most susceptible to potential impacts along these links include:

- Views from residential areas in Haines
- Views from travelers along roadways
- Views from small boats
- Views from Chilkat State Park
- Views from cabins
- Views from resorts/camps
- Views from hikers on trails within Chilkat State Park
- Views from Haines State Forest Resource Management Area

The inherent visual quality of the existing setting can be characterized as variety class B. Related to VQOs, no Forest Service lands would be affected. Visual absorption capabilities along these links have been characterized as intermediate to very high based on the highway being sited on gentler terrain through homogeneous vegetation. It is likely that moderate to low levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor.

4.2.4.4 Links W-6 Through W-8

Views most susceptible to potential impacts along these links include:

- Views from small boats
- Views from Chilkat State Park
- Views from cabins
- Views from hikers on trails within Chilkat State Park
- Views from Haines State Forest Resource Management Area
- Views from visitors accessing Davidson Glacier

The inherent visual quality of the existing setting can be characterized as variety class A. Related to VQOs, no Forest Service lands would be affected. Visual absorption capabilities along these links have been characterized as very high to intermediate high based on a diversity of vegetation occurring on a relatively flat river inlet. It is likely that low to moderate levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor.

One photographic simulation was developed from this area (WLVP2). The highway would traverse the headwater delta of the Davidson Glacier. The topography is very flat along this portion of the highway. It is likely the highway would become a subordinate feature within the existing natural setting. The basis of this conclusion is a factor of limited, if any, visible cuts and reduction of project visibility as a factor of vegetative screening.

4.2.4.5 Links W-8 Through W-19

Views most susceptible to potential impacts along these links include:

- Views from small boats
- Views from cabins and anchorages
- Views from hikers on trails
- Views from Sullivan Island and Sullivan Island State Marine Park
- Views from visitors accessing Endicott River Wilderness

The inherent visual quality of the existing setting can be characterized as variety class A (Links W-14 and W-19), variety class B, and variety class C (Link W-14). Related to VQOs, Forest Service lands comprise a range between Retention (primarily at river mouth), Partial Retention, and Modification (Portions of Links W-10, W-11, W-12, and W-14), whereas non-forest land is not affected. Visual absorption capabilities along these links have been characterized as very high to intermediate based on a homogeneous vegetation occurring on a relatively gentler terrain. It is likely that low to moderate levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor.

4.2.4.6 Link W-19 (Southern Portion)

Views most susceptible to potential impacts along this link include:

- Views from small boats
- Views from hikers on trails and secondary roads
- Views on visitors accessing Endicott River Wilderness

The inherent visual quality of the existing setting can be characterized as variety class A. Related to VQOs, Forest Service lands were assigned Retention, whereas non-forest land is not affected. Visual absorption capabilities along these links have been characterized as very high to very low at the crossing of Endicott River based on the inability of the landscape to absorb a proposed bridge at this crossing. It is likely that moderate to very high levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor.

The simulated viewpoint from WLVP3 occurs at the delta of the Endicott River within the foreground threshold of the highway. Topography consists mainly of rolling hills within a closed-canopied forest and wetlands associated with the Endicott River. It is likely that the proposed roadway would be intermittently noticeable from within the foreground and middleground-viewing thresholds yet subordinate to the existing setting. The proposed bridge crossing the Endicott River may become a dominant feature within this viewshed. Further the existing natural setting contains many features that dominate the viewshed (e.g., the Endicott River delta and mountain ranges, as well as coastline features [rock out crops]). Minimal, if any, areas of cuts may be visible within the river delta.

4.2.4.7 Links W-20 Through W-21

Views most susceptible to potential impacts along these links include:

- Views from small boats
- Views on visitors accessing Endicott River Wilderness

The inherent visual quality of the existing setting can be characterized as variety class A. Related to VQOs, Forest Service lands were assigned Retention and Partial Retention, whereas non-forest land is not affected. Visual absorption capabilities along these links have been characterized as intermediate to very high based on the highway being constructed on more gentle terrain through homogeneous vegetation. It is likely that low to moderate levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor.

One photographic simulation (WLVP4) was developed from this area. Viewers of the highway from this distance are likely to notice an intermittent linear band around the toe of William Henry Mountain. Unlike the terrain characterized along the East Lynn Canal Highway Alternative, the alignment of this portion of the highway has reduced linear visibility based on the roadway being sited on a more gentle topographic bench. This view demonstrates the effectiveness of vegetative screening. The existing rock outcrops also assists the highway to become a more co-dominant to subordinate feature within the existing setting when compared to cut areas of the highway.

4.2.4.8 Link W-22

Views most susceptible to impact along this link include:

- Views from small boats
- Views on visitors accessing Endicott River Wilderness
- Views from persons accessing private land and cabins
- Views from hikers on trails

The inherent visual quality of the existing setting can be characterized as variety class B. Related to VQOs, Forest Service lands were assigned Retention. Visual absorption capabilities along these links have been characterized as intermediate to intermediate low based on the highway being constructed on steeper terrain than the previous links through a relatively homogeneous vegetation. The proposed William Henry Bay Ferry Terminal would likely be a noticeable and dominant facility within this confined setting and would require substantial cuts along adjacent hillsides to site the facility. It is likely that moderate to very high levels of impact would occur on sensitive viewers and on visual quality for this portion of the corridor.

The simulated view from WLVP5 occurs within William Henry Bay approximately three-tenths of a mile from the highway. Topography along this portion of the highway consists of primarily rolling to steep hills. Vegetation is of a closed canopy forest character. William Henry Bay is a small enclosed bay. Middleground and background views of the highway would be limited from marine travelers. The roadway itself would be visible intermittently as it traverses east and north around the outer edge of the bay and is likely to become a co-dominant to subordinate feature within the existing natural setting. However, the proposed ferry terminal is likely to dominate the existing viewshed as a high degree of project visibility related to changes on form, line, color, and texture characteristics would occur.

4.2.5 Alternative 3: West Lynn Canal – Quantitative Visual Impact Assessment

4.2.5.1 Direct Potential Impacts on Sensitive Viewers

4.2.5.1.1 Theme 1 – Travelways

Travelway impacts describe the visual effects of the highway as viewed by travelers along major and secondary travel routes.

Figure 14 illustrates potential impacts on Theme 1 viewers.

4.2.5.1.2 Theme 2 – Key Viewpoints

Input from the Tongass National Forest, municipal plans, and other secondary sources of data identified key viewpoints that potentially may be affected by the highway.

Figure 15 illustrates potential impacts on Theme 2 viewers.

4.2.5.1.3 Theme 3 – Key Viewing Areas

Key viewing areas include larger geographic areas sensitive to changes within respective viewsheds. Although not one single viewpoint is assessed as in the previous assessment (i.e., key viewpoints) a larger area is considered that accounts for dispersed and intermittent viewers within this area.

Figure 16 illustrates potential impacts on Theme 3 areas.

4.2.5.1.4 Theme 4 – Congressionally Designated or Considered for Designation Special Management Areas

These areas include congressionally designated places or areas being considered for designation. It should be noted that while these areas are afforded protection under federal law, adjacent visual impacts on lands undesignated are not afforded the same level of protection and are presented here for information purposes only.

Figure 17 illustrates potential impacts on Theme 4 areas.

4.2.5.2 Summary of Impact Results on Sensitive Viewers

For the purposes of summarizing the four sensitive viewer impact themes (as presented above), Figure 18 accounts for all sensitive viewer theme sets along Alternative 3. These conclusions were based on the potential impact level calculated from the closest features to the highway within Themes 1, 2, and 3.

Figure 18 illustrates a composite of potential impacts on all theme sets for Alternative 3.

4.2.5.3 Direct Potential Impacts on Visual Quality

Potential impacts on visual quality describe the change created by the highway within a specific setting. Impact levels were determined by comparing the existing variety class with the ability of the landscape to absorb changes (i.e., visual absorption capability) or increased visibility related to modifications to form, line, color, and textural elements that create the inherent aesthetic value of a particular landscape setting. Table 15 discloses visual quality impacts by acres affected by Alternative 3. Figure 19 illustrates potential impacts on visual quality for Alternative 3.

Table 15
Alternative 3 Impact on Visual Quality (acres)

Alternative	Very High Impact on Forest Service Land	Very High on Non-Forest Service Land	High Impact on Forest Service Land	High Impact on Non-Forest Service Land	Moderate Impact on Forest Service Land	Moderate Impact on Non-Forest Service Land	Low Impact on Forest Service Land	Low Impact on Non-Forest Service Land
Alternative 3 – West Lynn Canal Highway	20	170	41	30	1,569	936	45	0

4.2.6 Alternatives 4A, 4B, 4C, and 4D: (Marine) Qualitative Visual Impact Assessment

This group of alternatives contains four options (i.e., 4A, 4B, 4C, 4D), which involve modifications to existing ferry terminals and/or new terminals and/or a small stretch of new highway. Potential impacts associated with Alternatives 4B and 4D have highway segments that extend Glacier Highway to Sawmill Cove. Potential impacts associated with these alternatives, related to the connection from Glacier Highway to Sawmill Cove, have been discussed under Alternative 2 (see discussion of Links E-34, E-35, and E-36). For Alternatives 4A and 4C, these are entirely marine alternatives and potential impacts associated with these alternatives are not quantifiable. Admittedly, increased views of additional ferries may result as a part of these alternatives, but are considered low impacts.

4.2.7 Alternatives 4B and 4D: (Marine) Quantitative Visual Impact Assessment

The following section discusses potential impacts associated with Alternatives 4B and 4D.

4.2.7.1 Direct Potential Impacts on Sensitive Viewers

4.2.7.1.1 Theme 1 – Travelways

Travelway impacts describe the visual effects of the highway as viewed by travelers along major and secondary travel routes.

Figure 20 illustrates potential impacts on Theme 1 viewers.

4.2.7.1.2 Theme 2 – Key Viewpoints

Input from the Tongass National Forest, municipal plans, and other secondary sources of data identified key viewpoints that potentially may be affected by the highway.

Figure 21 illustrates potential impacts on Theme 2 viewers.

4.2.7.1.3 Theme 3 – Key Viewing Areas

Key viewing areas include larger geographic areas sensitive to changes within respective viewsheds. Although no one single viewpoint is assessed as in the previous assessment (i.e., key viewpoints) a larger area is considered that accounts for dispersed and intermittent viewers within this area.

Figure 22 illustrates potential impacts on Theme 3 areas.

4.2.7.1.4 Theme 4 – Congressionally Designated or Considered for Designation Special Management Areas

These areas include congressionally designated places or areas being considered for designation. It should be noted that while these areas are afforded protection under federal law, adjacent visual impacts on lands undesignated are not afforded the same level of protection and are presented here for information purposes only.

Figure 23 illustrates potential impacts on Theme 4 areas.

4.2.7.2 Summary of Impact Results on Sensitive Viewers

For the purposes of summarizing the four sensitive viewer impact themes (as presented above), Figure 24 accounts for all sensitive viewer theme sets along Alternatives 4B and 4D. It should be noted that these conclusions were based on the potential impact level calculated from the closest features to the highway within Themes 1, 2, and 3.

Figure 24 illustrates a composite of potential impacts on all theme sets for Alternatives 4B and 4D.

4.2.7.3 Direct Potential Impacts on Visual Quality

Potential impacts on visual quality describe the change created by the highway within a specific setting. Impact levels were determined by comparing the existing variety class with the ability of the landscape to absorb changes (i.e., visual absorption capability) or increased visibility related to modifications to form, line, color, and textural elements that create the inherent aesthetic value of a particular landscape setting.

Table 16 discloses visual quality impacts by acres affected by Alternatives 4B and 4D. Figure 25 illustrates potential impacts on visual quality for Alternatives 4B and 4D.

Table 16
Alternatives 4B and 4D Impact on Visual Quality (acres)

Alternative	Very High Impact on Forest Service Land	Very High Impact on Non-Forest Service Land	High Impact on Forest Service Land	High Impact on Non-Forest Service Land	Moderate Impact on Forest Service Land	Moderate Impact on Non-Forest Service Land	Low Impact on Forest Service Land	Low Impact on Non-Forest Service Land
Alternatives 4B and 4D – Marine Alternative	0	13	16	21	177	180	0	0

4.3 COMPATIBILITY WITH VISUAL QUALITY OBJECTIVES

As stated in the previous chapter, compatibility with the Tongass National Forest VQOs was derived from the existing VMS inventory completed by the Forest Service. The derivation of compatibility determinations considered the interrelationship between the potential expected impact level and VQOs of LUDs adjacent to the highway. This analysis relates to the Forest Service “Desired Condition” for the TUS LUD which states that facilities should be “designed to be compatible to the adjacent LUD to the maximum extent feasible.” Those areas not compatible would be candidate areas for application of mitigation such as vegetating shot-rock slopes by placing soil and seeding it. Other areas may be considered further by DOT&PF and the Forest Service based on specific Forest Service concerns. Table 17 presents the compatibility matrix utilized for this project for forest system lands traversed by the highway. Table 18 discloses the percentage of adjacent VQO compatibility along the TUS LUD.

Table 17
Compatibility Matrix

Impact Level	Visual Quality Objectives			
	Retention	Partial Retention	Modification	Maximum Modification
Very High	No	No	NC ^a	Yes
High	No	NC	Yes	Yes
Moderate	NC	Yes	Yes	Yes
Low	Yes	Yes	Yes	Yes

Note: NC – May or may not be compatible with adjacent VQO depending on final design features.

Table 18
Compatibility with Visual Quality Objectives (Percentages) of Adjacent LUD

Alternative	Yes	NC ^a	No	N/A ^b
East Lynn Alternatives	26.93%	55.75%	10.47%	6.85%
West Lynn Alternative	61.65%	O	1.47%	36.88%

Note: ^a May or may not be compatible with adjacent VQO depending on final design features.

² Not applicable because it is not Forest Service land.

Figure 26 illustrates areas where the highway is compatible, not compatible, or a conclusion cannot be determined until the design of the highway is closer to finalization. Figure 26 discloses the potential compatibility of the highway both within the TUS LUD corridor as well as with VQOs adjacent to the TUS LUD. It is important to note that the highway is compatible with the TUS LUD VQO of Modification. Figure 26 not only shows the TUS LUD compatibility determinations, but also makes compatibility conclusions regarding adjacent VQOs along the TUS LUD.

4.3.1 Visual Simulations

The visual simulations presented in this document (Simulations ELVP1 through ELVP15 and WLVP1 through WLVP5) represent a sampling of landscape settings (affected environment) along the highway as well as a representation of what the highway might look like when implemented (environmental consequences). As stated previously, the visual simulations were not included in the derivation of potential impacts; rather, they are to be used to better understand the scale and spatial dominance characteristics of the unmitigated highway and to verify the accuracy of the visual resources impact prediction models. Additionally, the simulations can be used to assess the effectiveness of applied mitigation measures in the future. Figure 27 is an index of the locations from which the simulations were developed.

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5.0 LIST OF PREPARERS

The following individuals contributed to the preparation of this document.

Richard Knox	Visual Resource Task Manager
Denny Papilion	Task Advisor
Randall Simpson	Independent Technical Reviewer
Richard Stuhan	GIS Specialist
Shirley Wiley	Editor
Dave Lawrence	Photographic Simulations

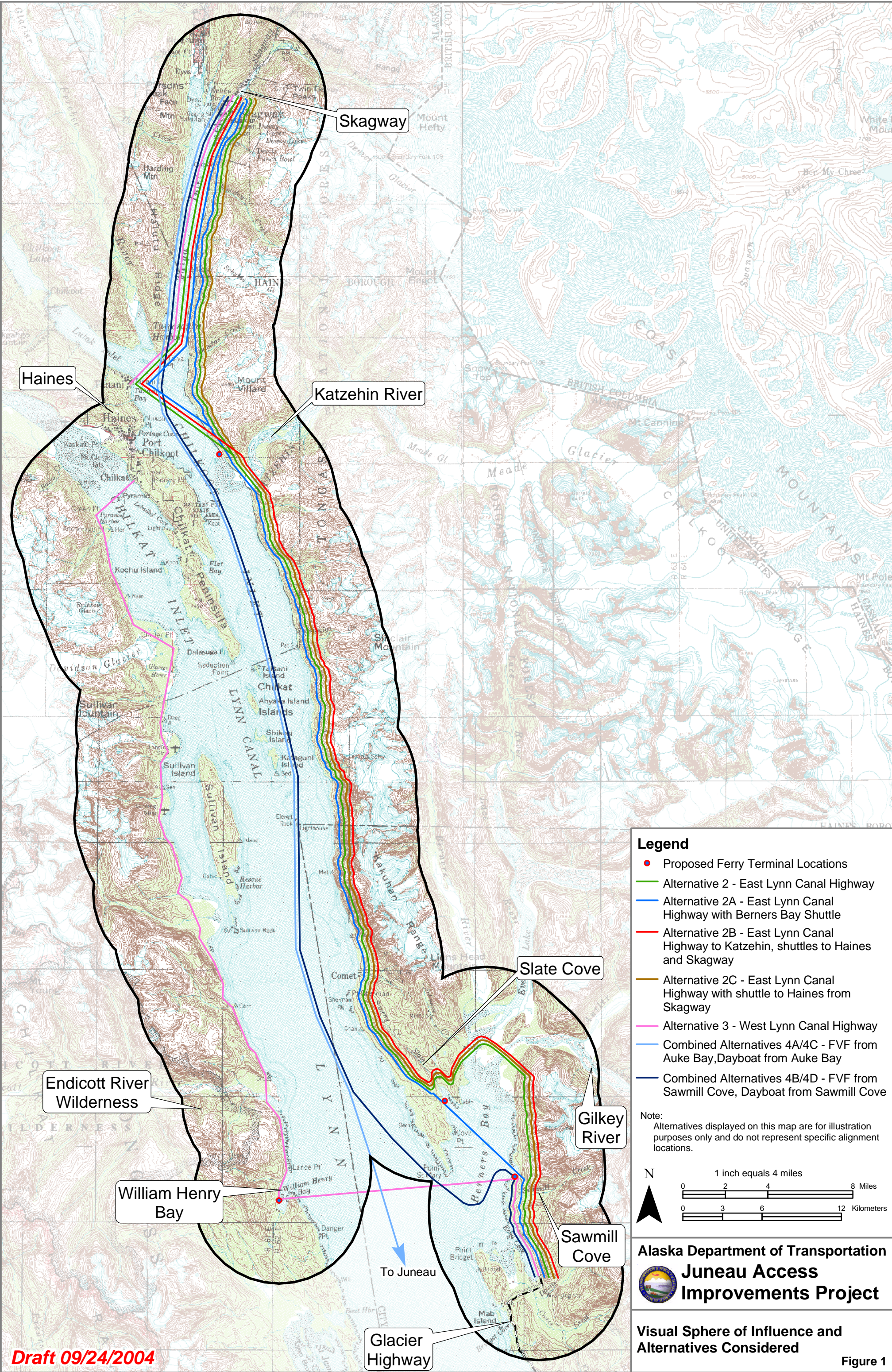
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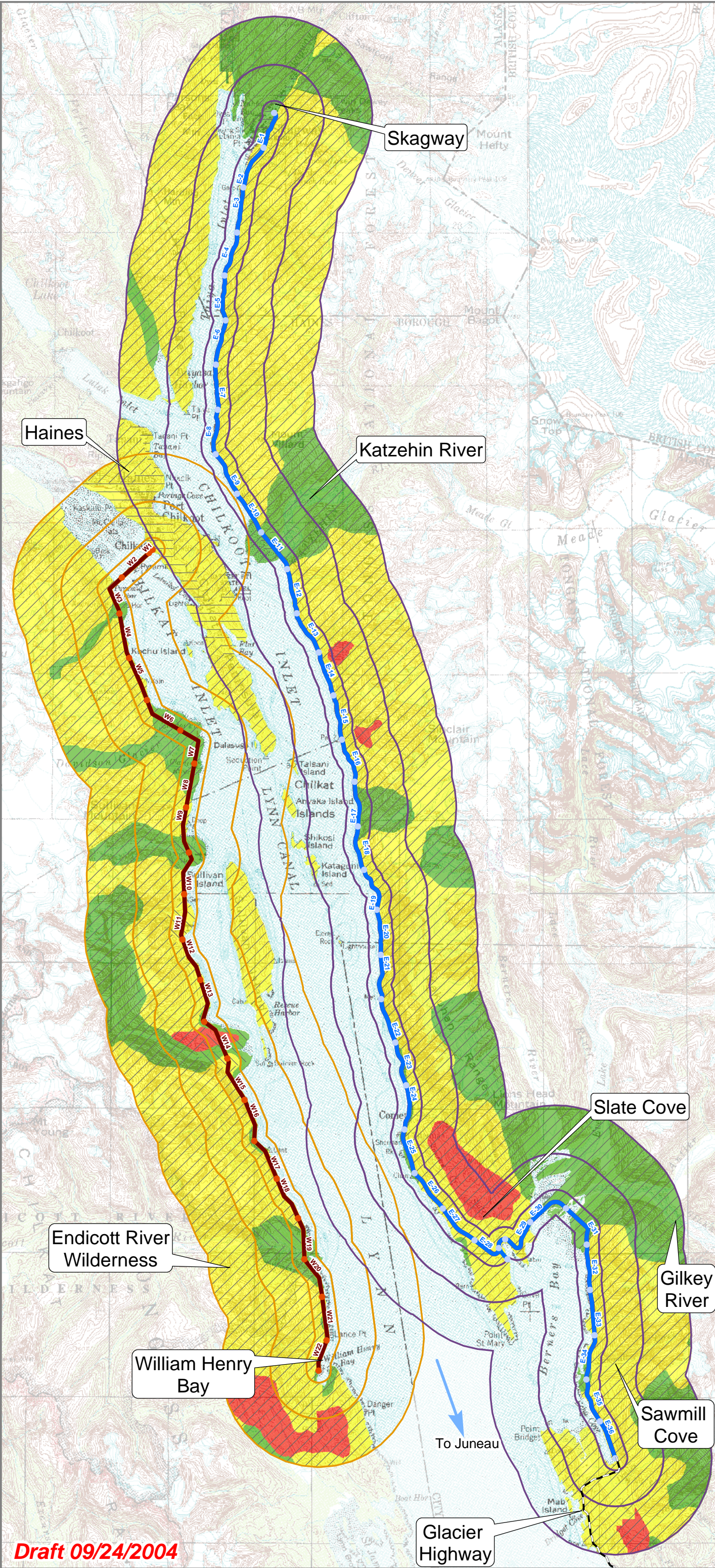
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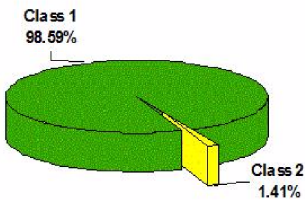
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FIGURES

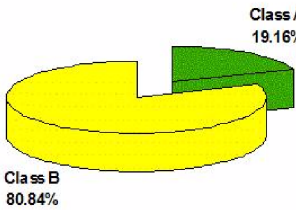




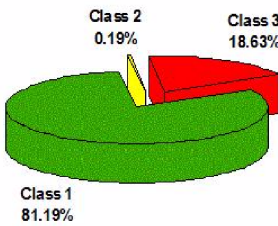
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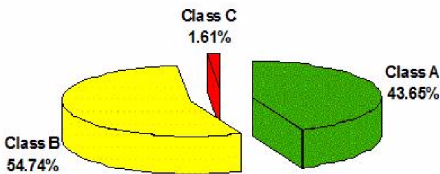
East Lynn Canal Variety Class



West Lynn Canal Existing Visual Condition

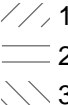


West Lynn Canal Variety Class



Legend

EVC



VC



- East Lynn Canal Link Nodes
- East Lynn Canal Alternative
- West Lynn Canal Link Nodes
- West Lynn Canal Alternative
- East Lynn Canal Buffer Zones
- West Lynn Canal Buffer Zones

N

1 inch equals 4 miles

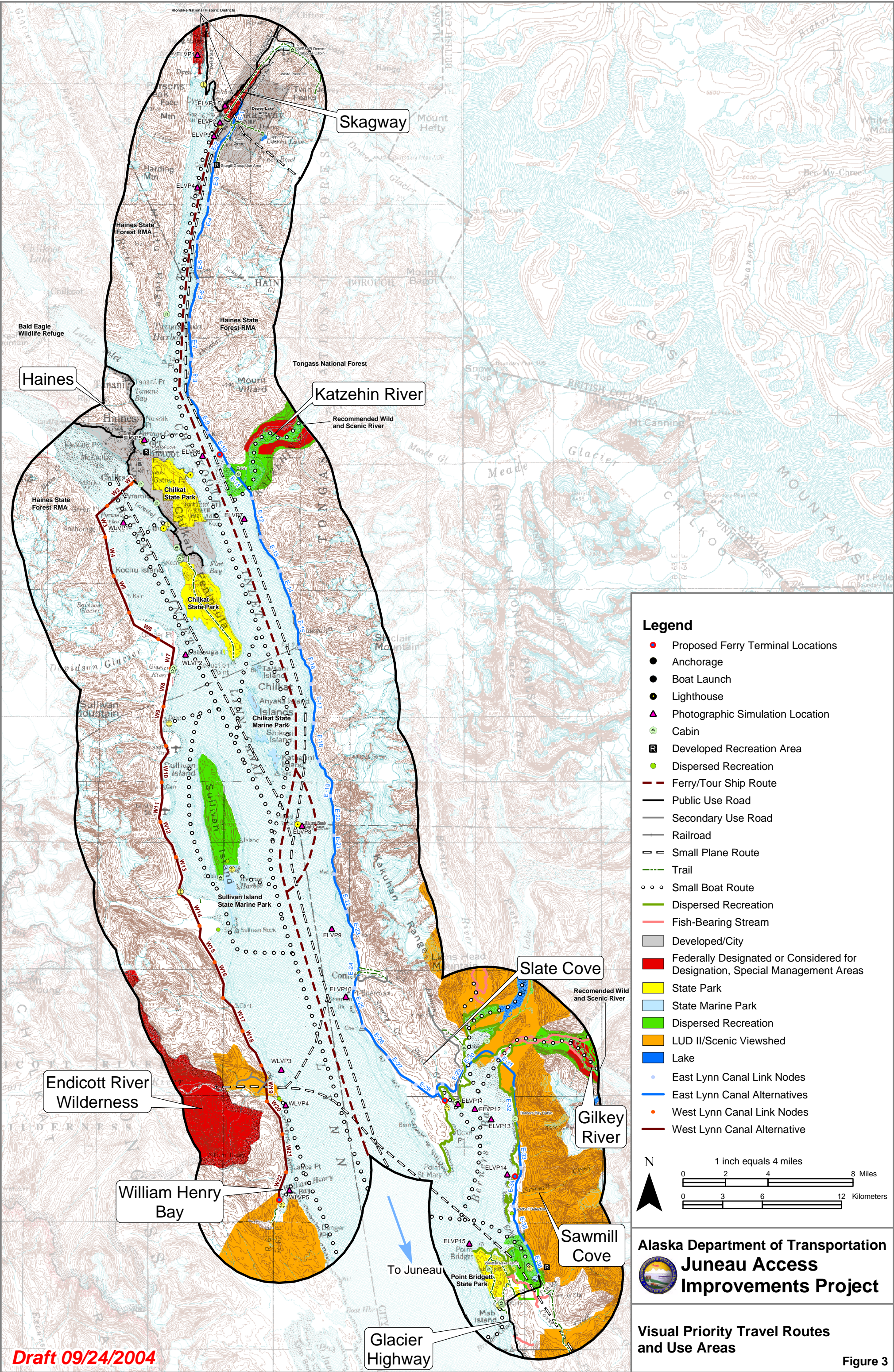


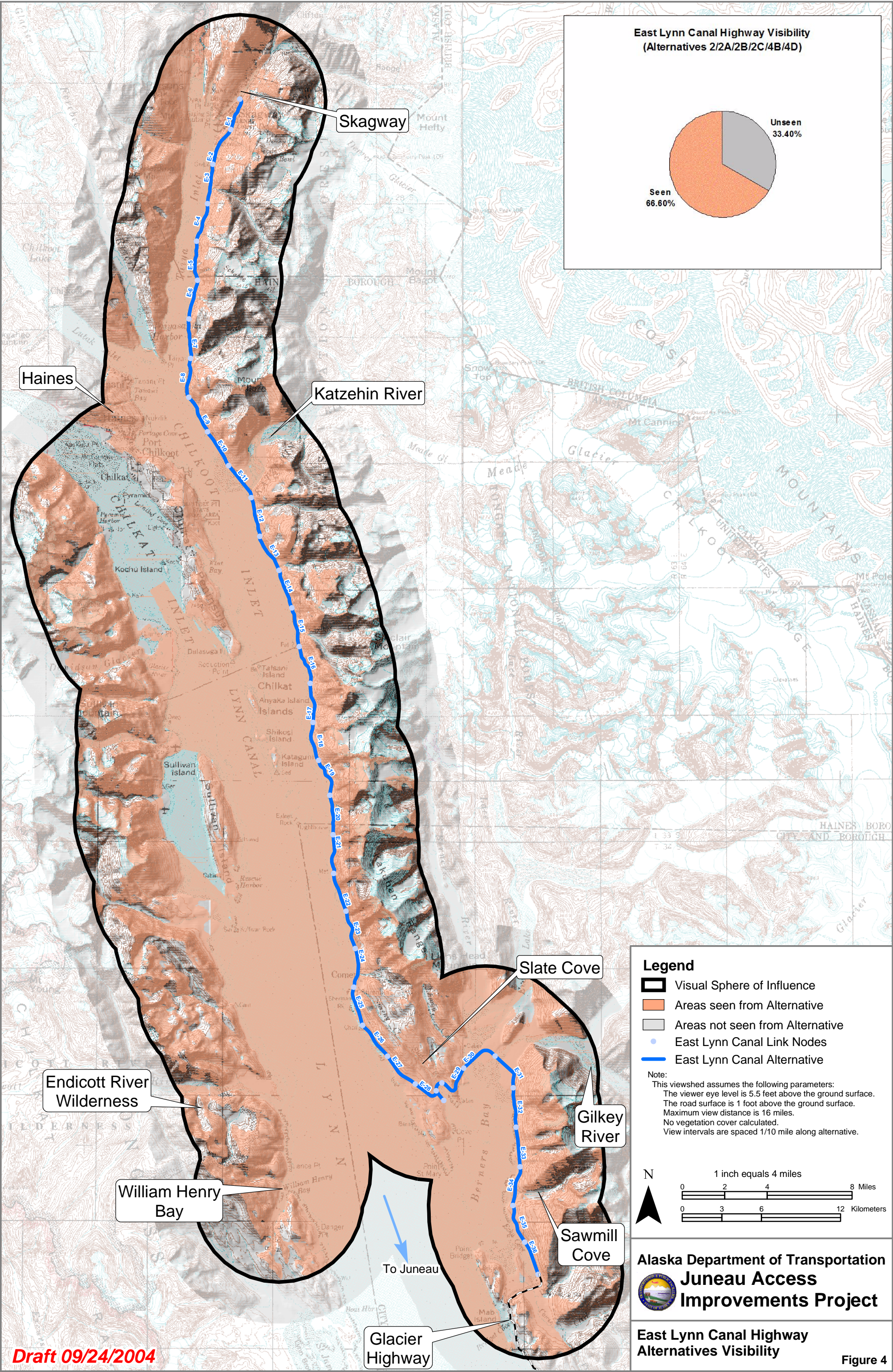
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**Juneau Access
Improvements Project**

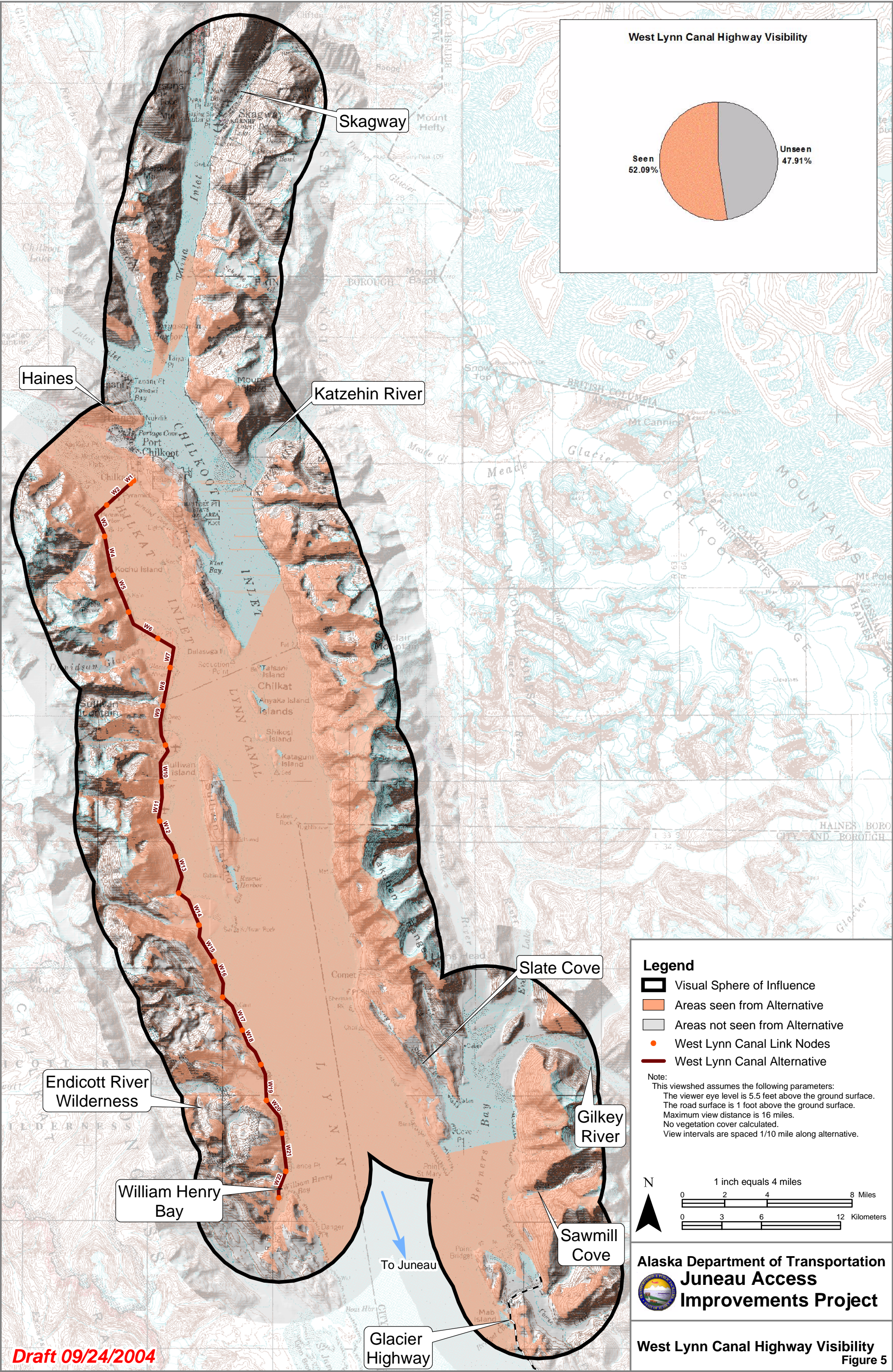
Existing Visual Condition and
Variety Class

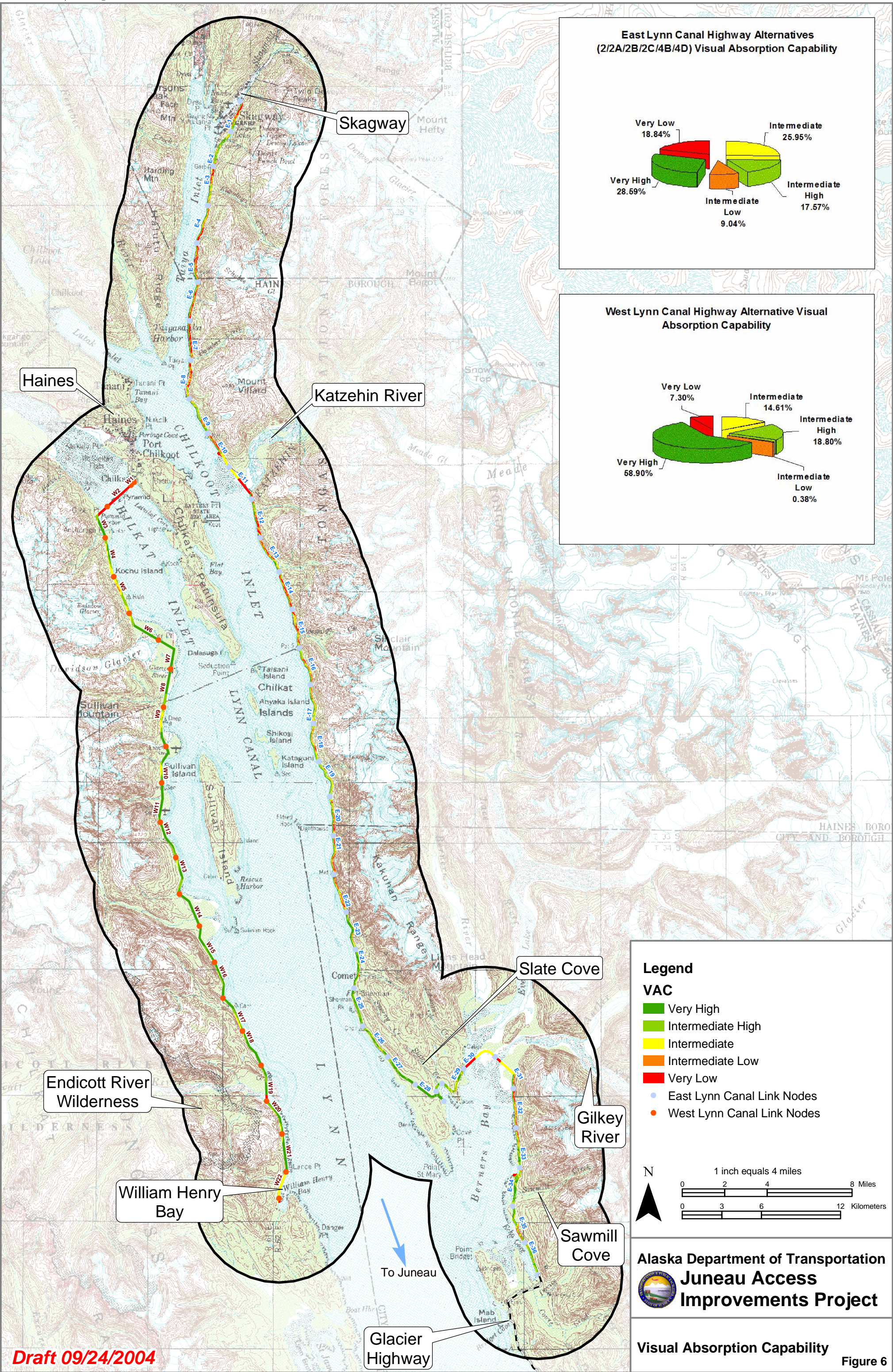
Draft 09/24/2004

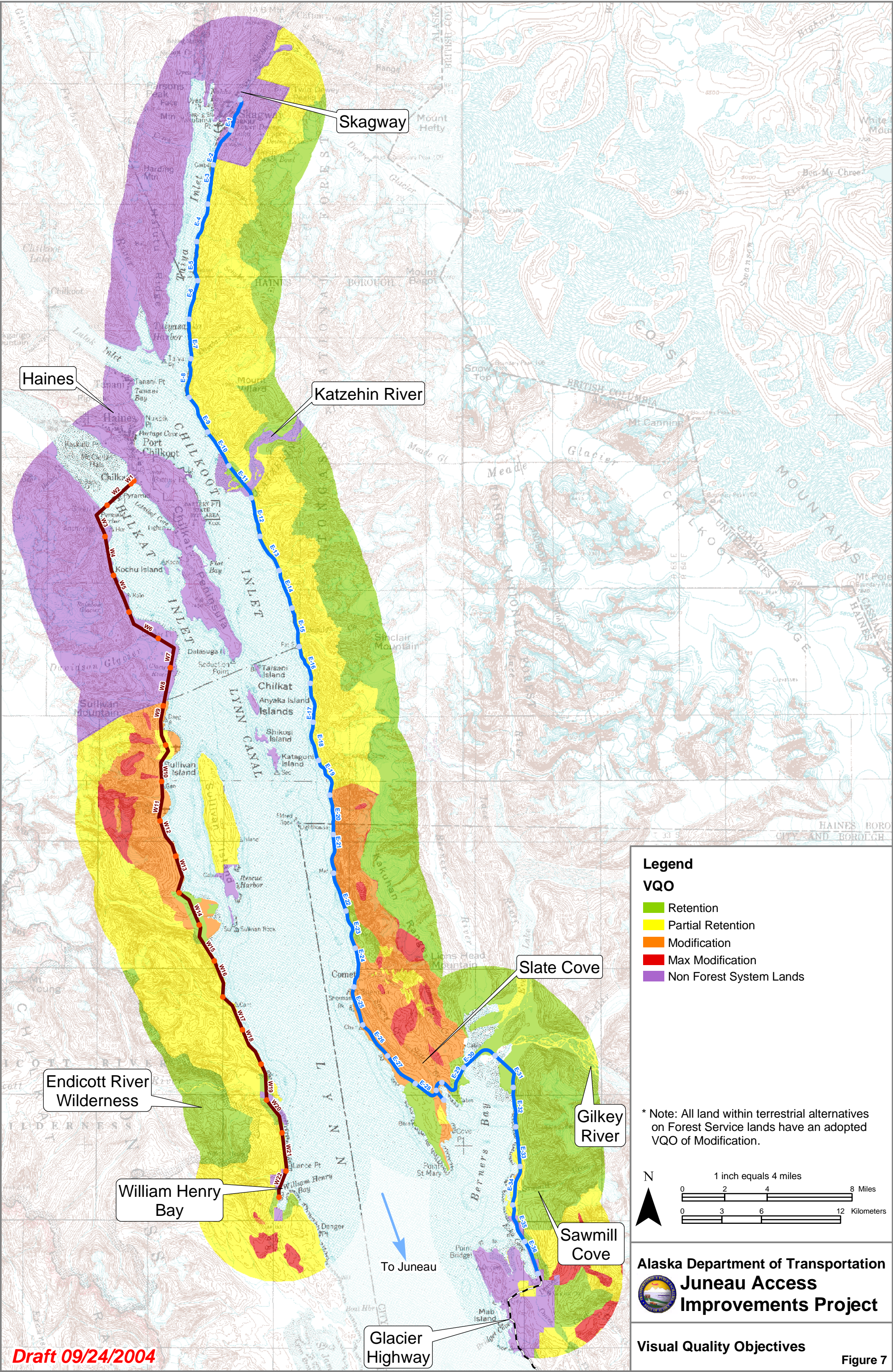
Figure 2

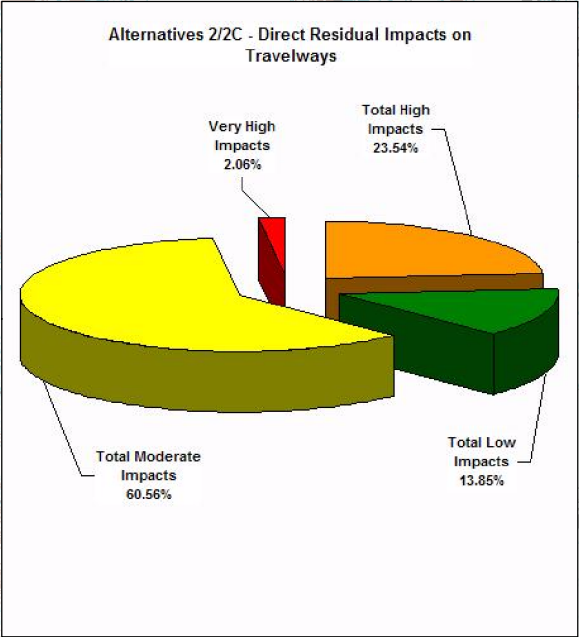
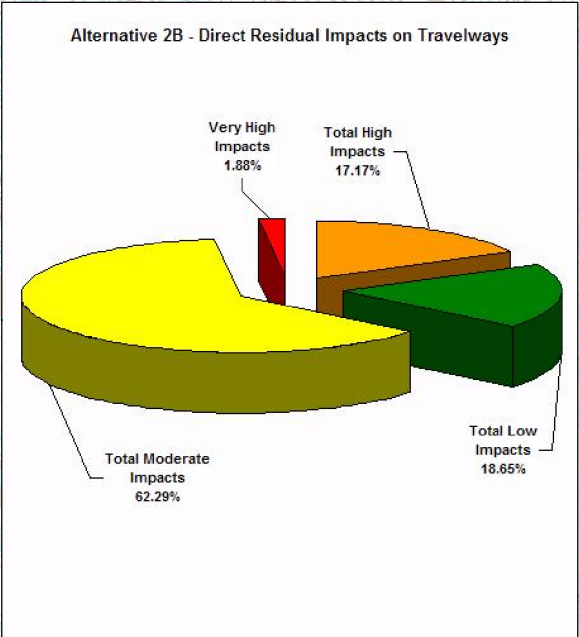
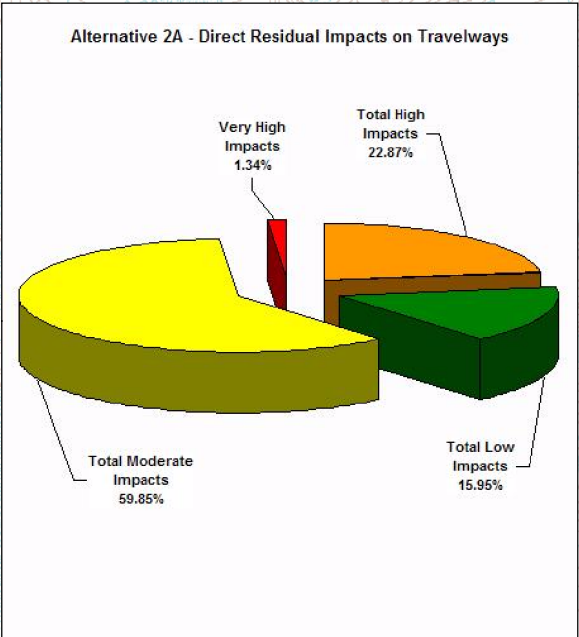
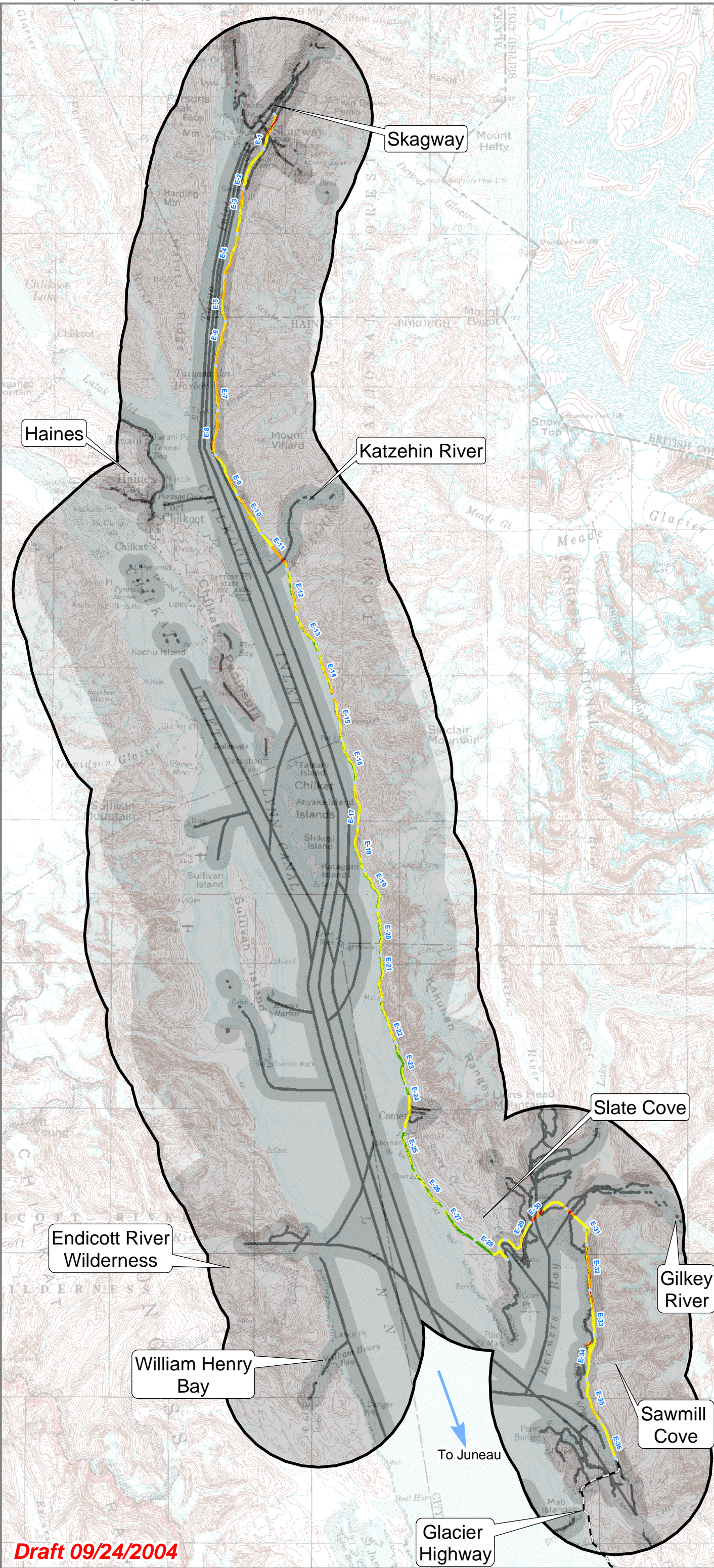






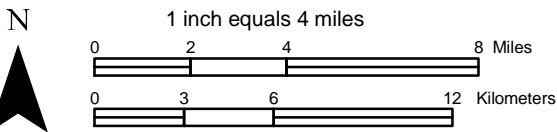






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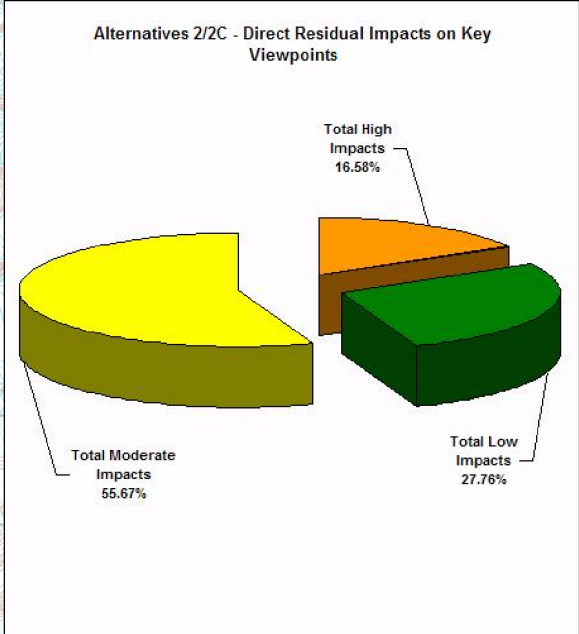
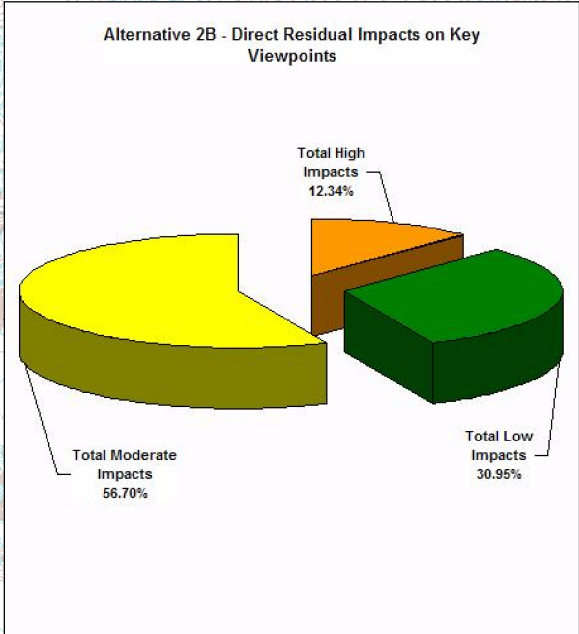
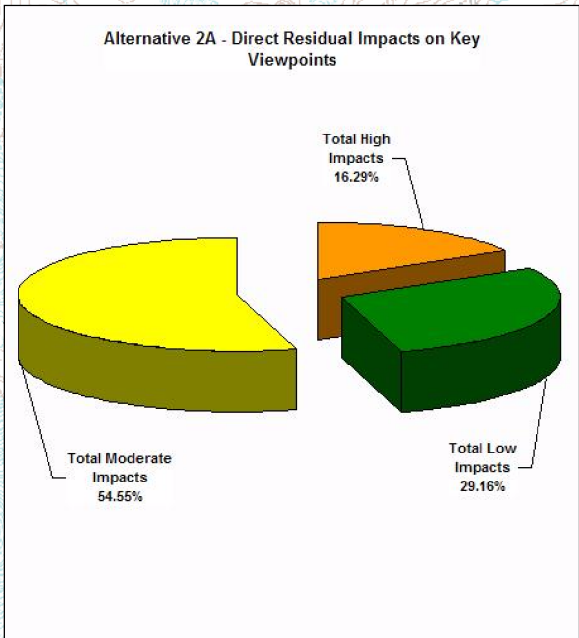
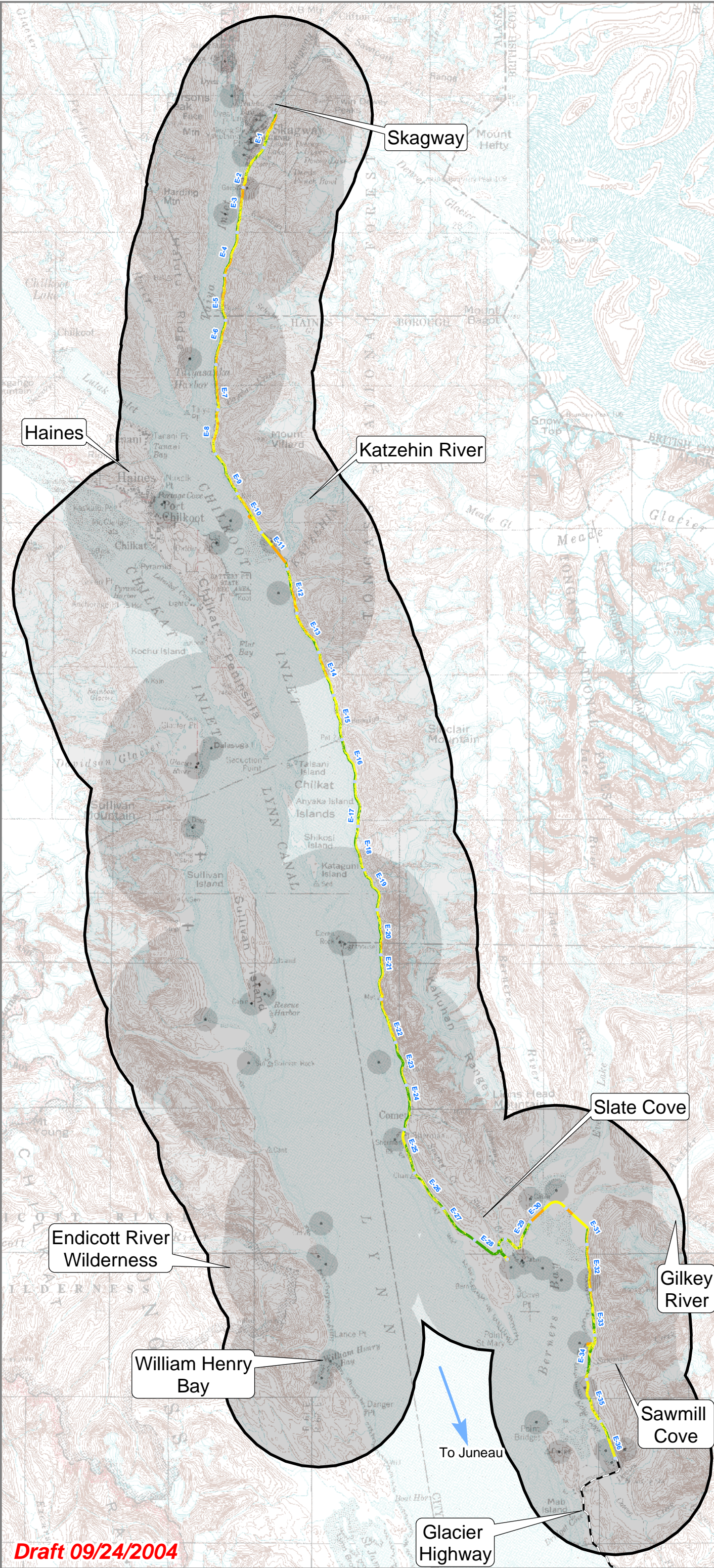
- East Lynn Canal Link Nodes
- Impact Levels
 - Very High
 - High
 - Moderate
 - Low
- Distance Zone from Travelway
 - 0 to 300 feet
 - 300 feet to 0.5 mile
 - 0.5 mile to 4 miles
 - Beyond 4 miles



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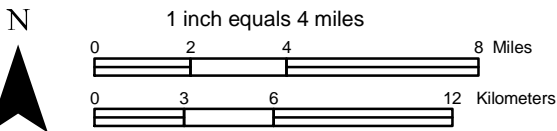
**Alternatives 2/2A/2B/2C
Direct Impacts on
Travelways**

Figure 8



Legend

- East Lynn Canal Link Nodes
- Impact Levels
 - Very High
 - High
 - Moderate
 - Low
- Distance Zone from Key Viewpoint
 - 0 to 300 feet
 - 300 feet to 0.5 mile
 - 0.5 mile to 4 miles
 - Beyond 4 miles

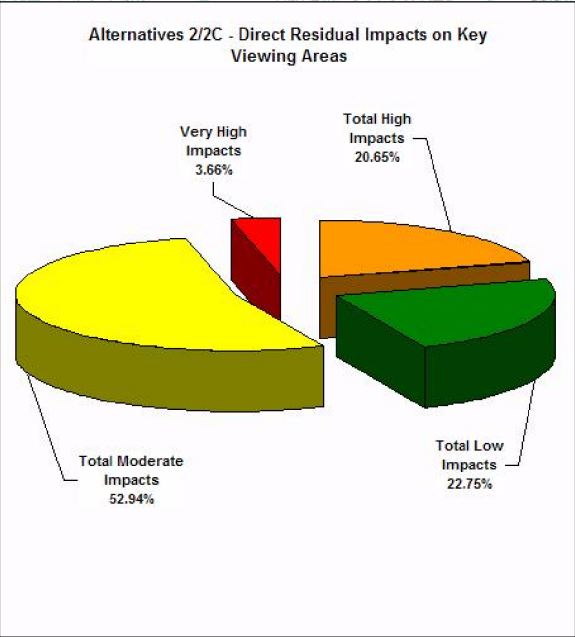
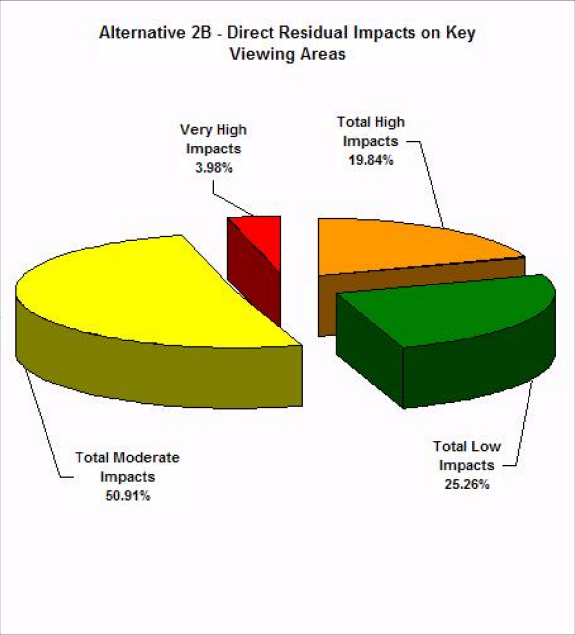
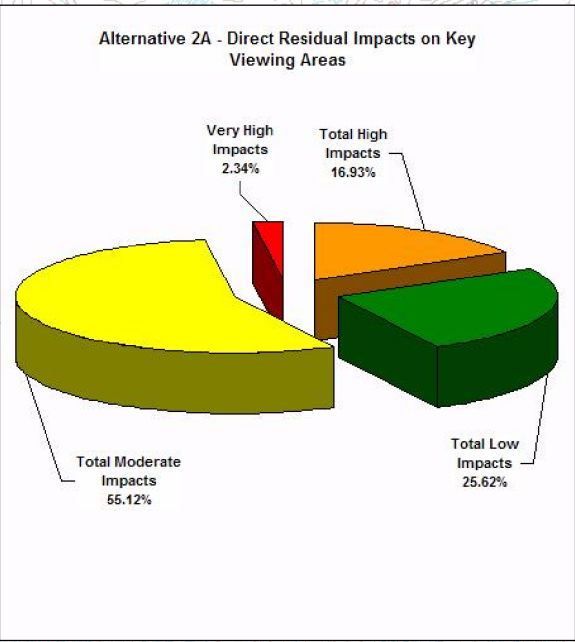
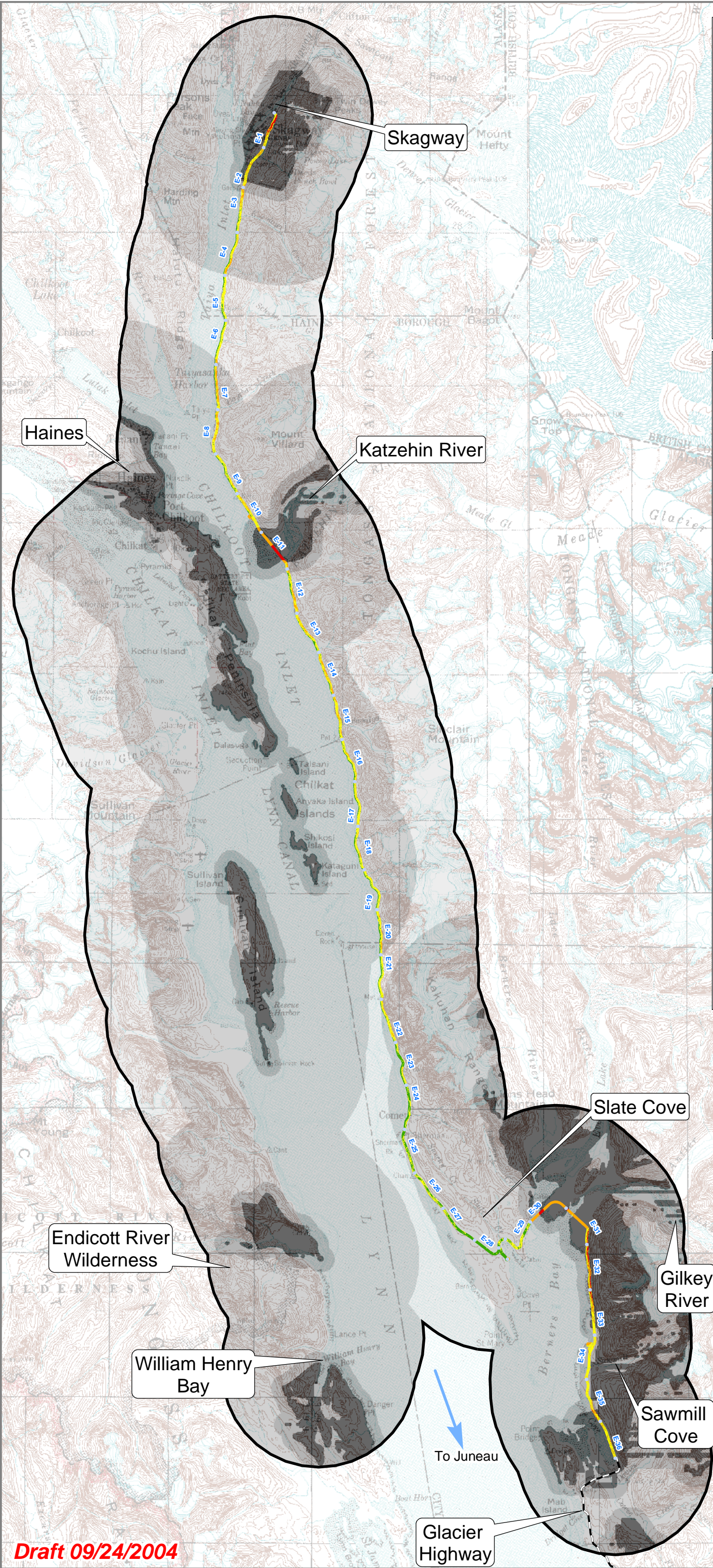


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Alternatives 2/2A/2B/2C
Direct Impacts on Key Viewpoints

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Figure 9



Legend

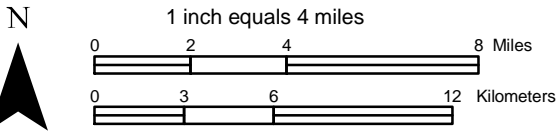
• East Lynn Canal Link Nodes

Impact Levels

- Very High
- High
- Moderate
- Low

Distance Zone from Key Viewing Areas

- 0 to 300 feet
- 300 feet to 0.5 mile
- 0.5 mile to 4 miles
- Beyond 4 miles

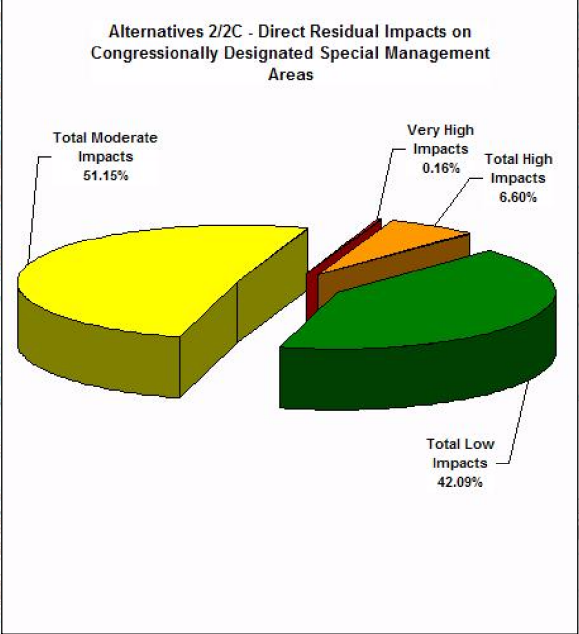
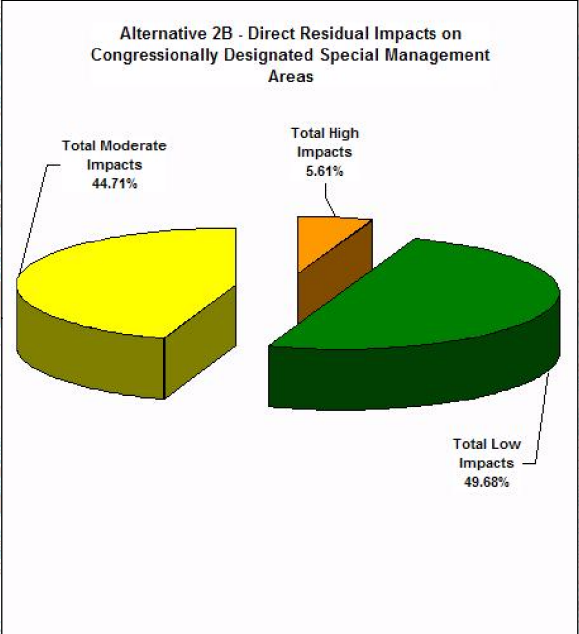
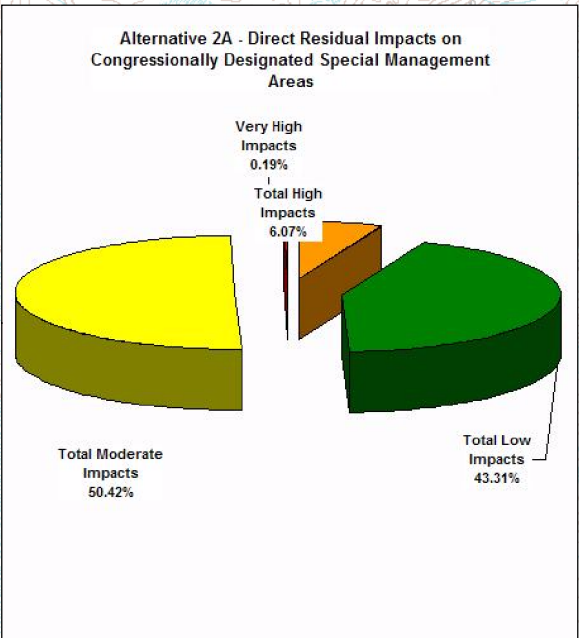
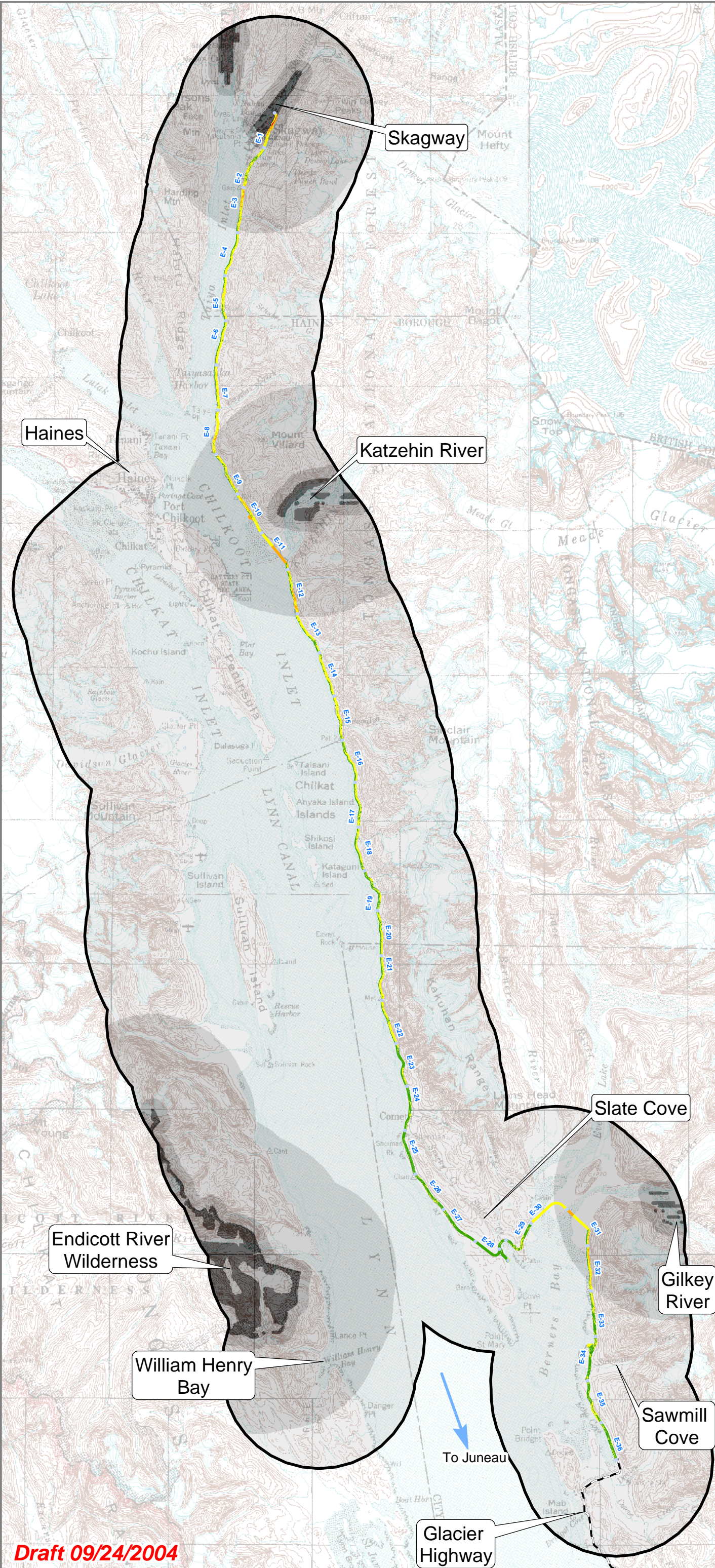


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Alternatives 2/2A/2B/2C
Direct Impacts on
Key Viewing Areas

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Figure 10

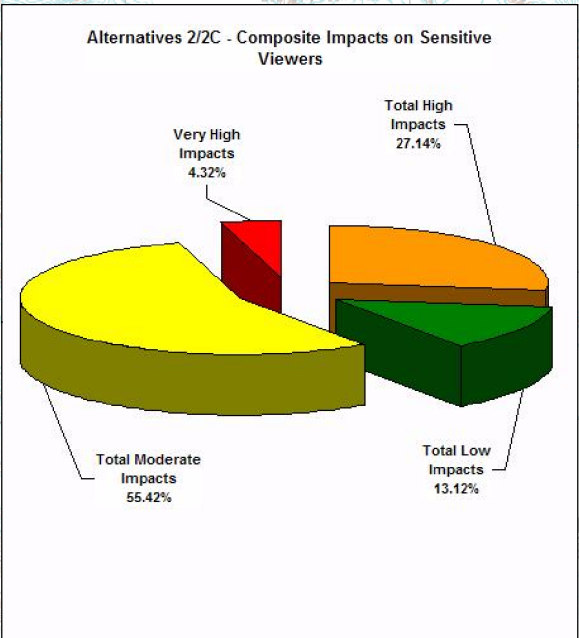
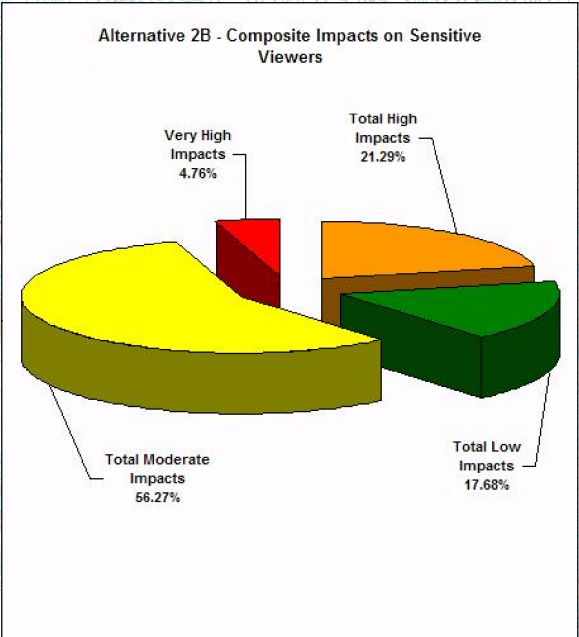
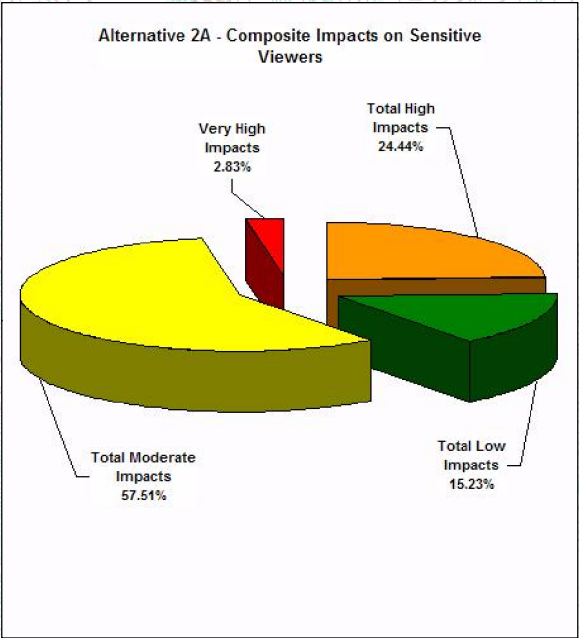
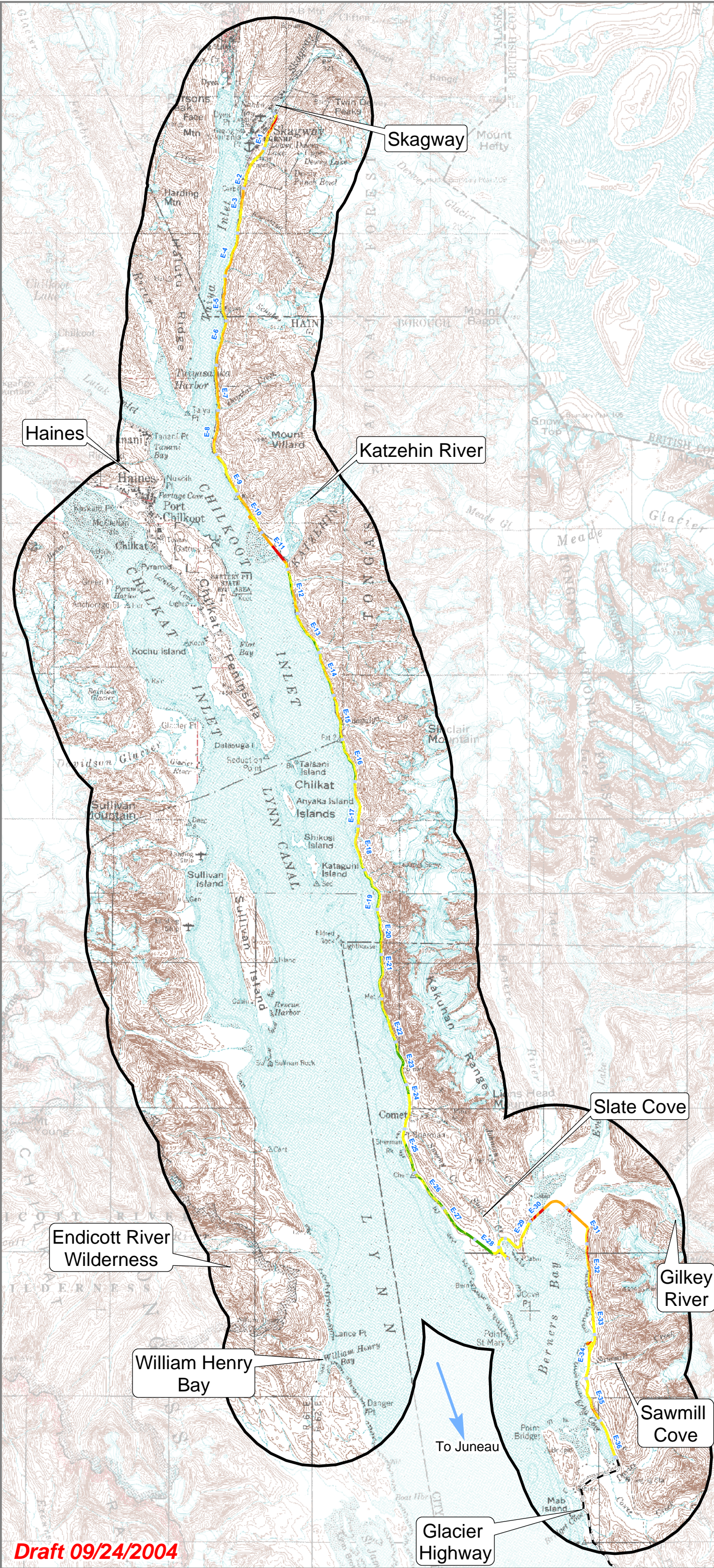


Legend

- East Lynn Canal Link Nodes
 - Impact Levels
 - Very High
 - High
 - Moderate
 - Low
 - Distance Zone from Congressionally Designated Special Management Area
 - 0 to 300 feet
 - 300 feet to 0.5 mile
 - 0.5 mile to 4 miles
 - Beyond 4 miles
- N
- 1 inch equals 4 miles
- 0 2 4 8 Miles
- 0 3 6 12 Kilometers

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Alternatives 2/2A/2B/2C
Direct Visual Impacts from Congressionally Designated Special Management Areas



Legend

East Lynn Canal Link Nodes

Impact Levels

- Very High
- High
- Moderate
- Low

N

1 inch equals 4 miles

0 2 4 8 Miles

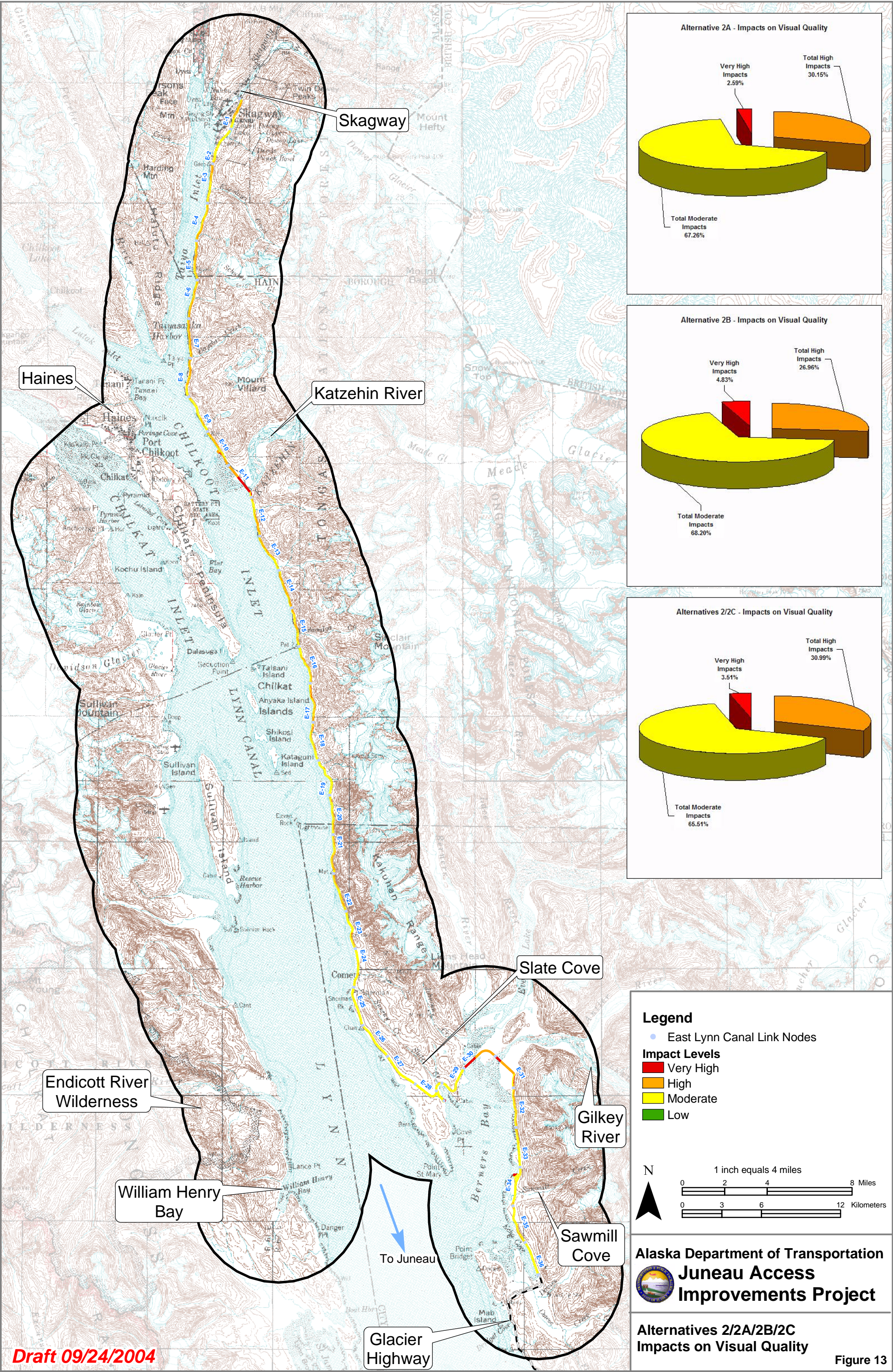
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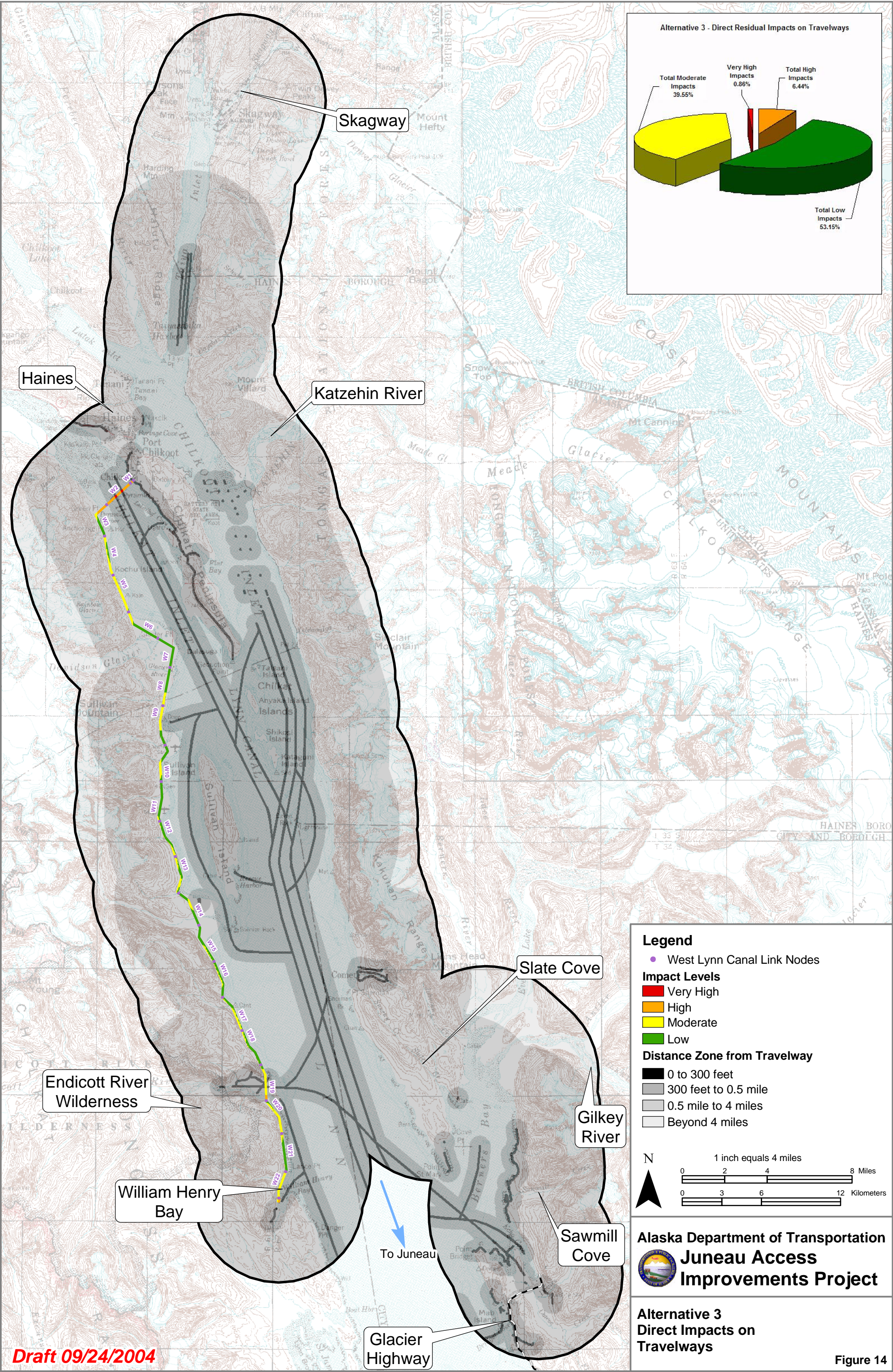
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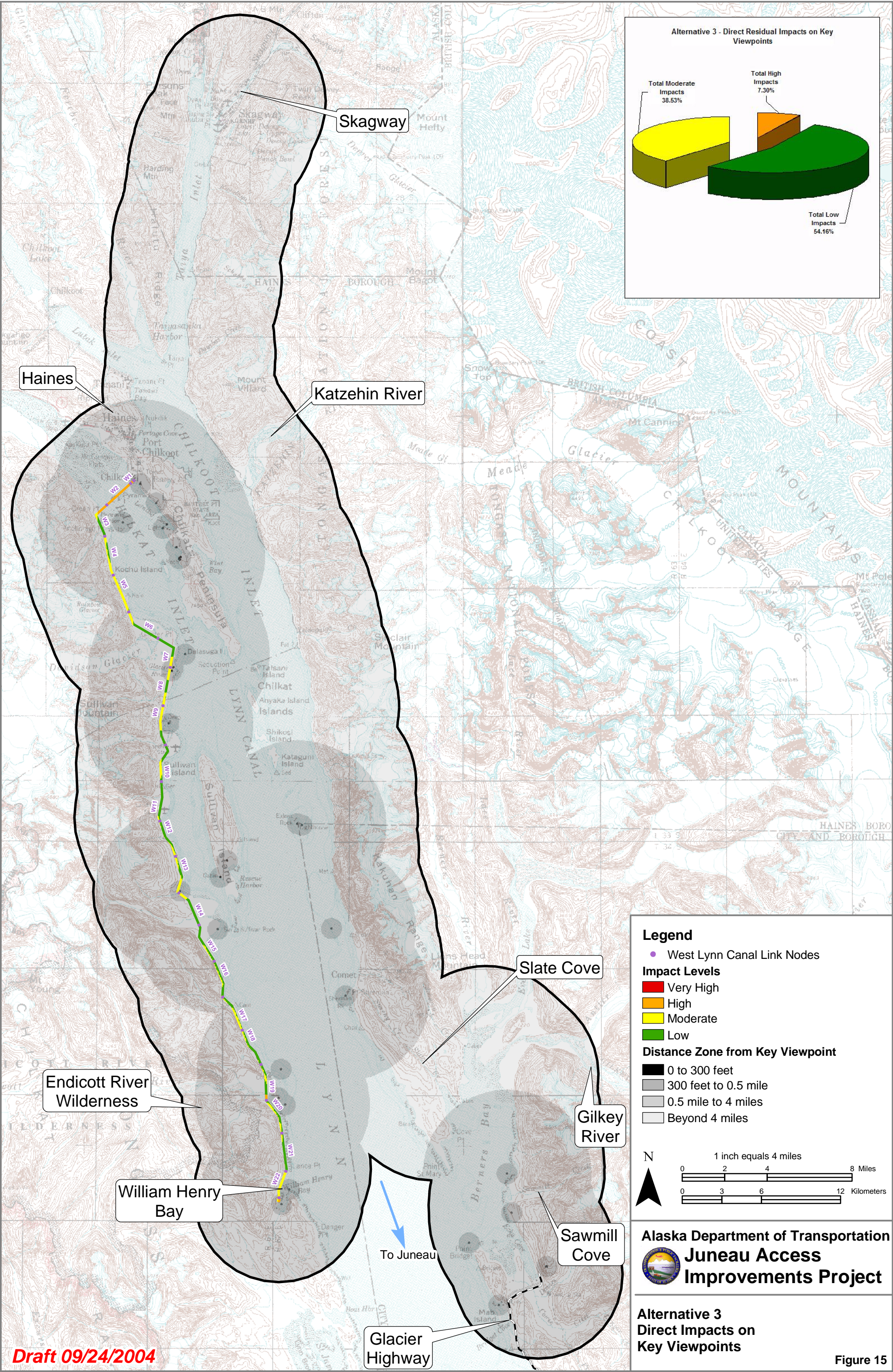
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Composite Impacts on Sensitive Viewers

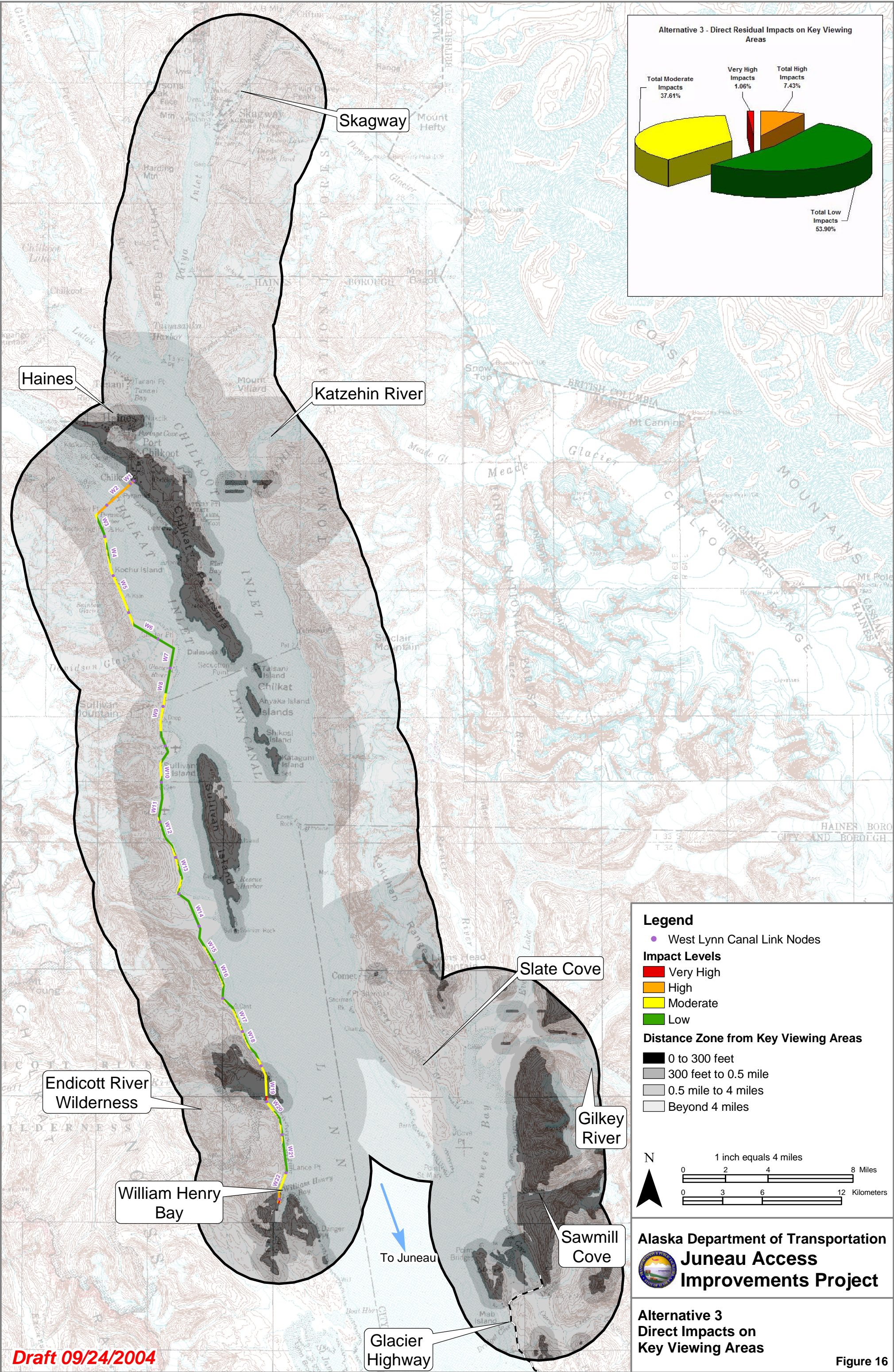
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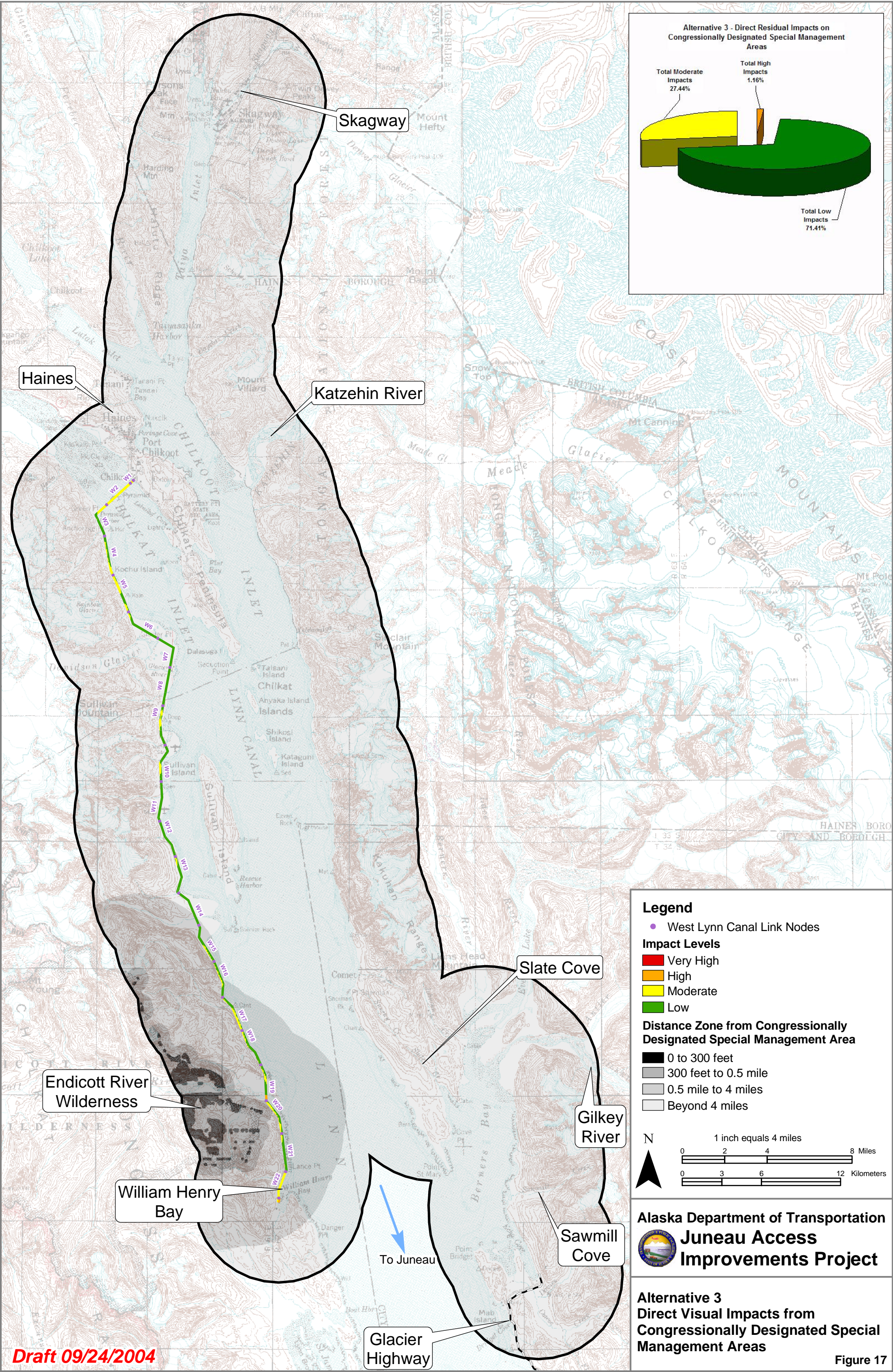
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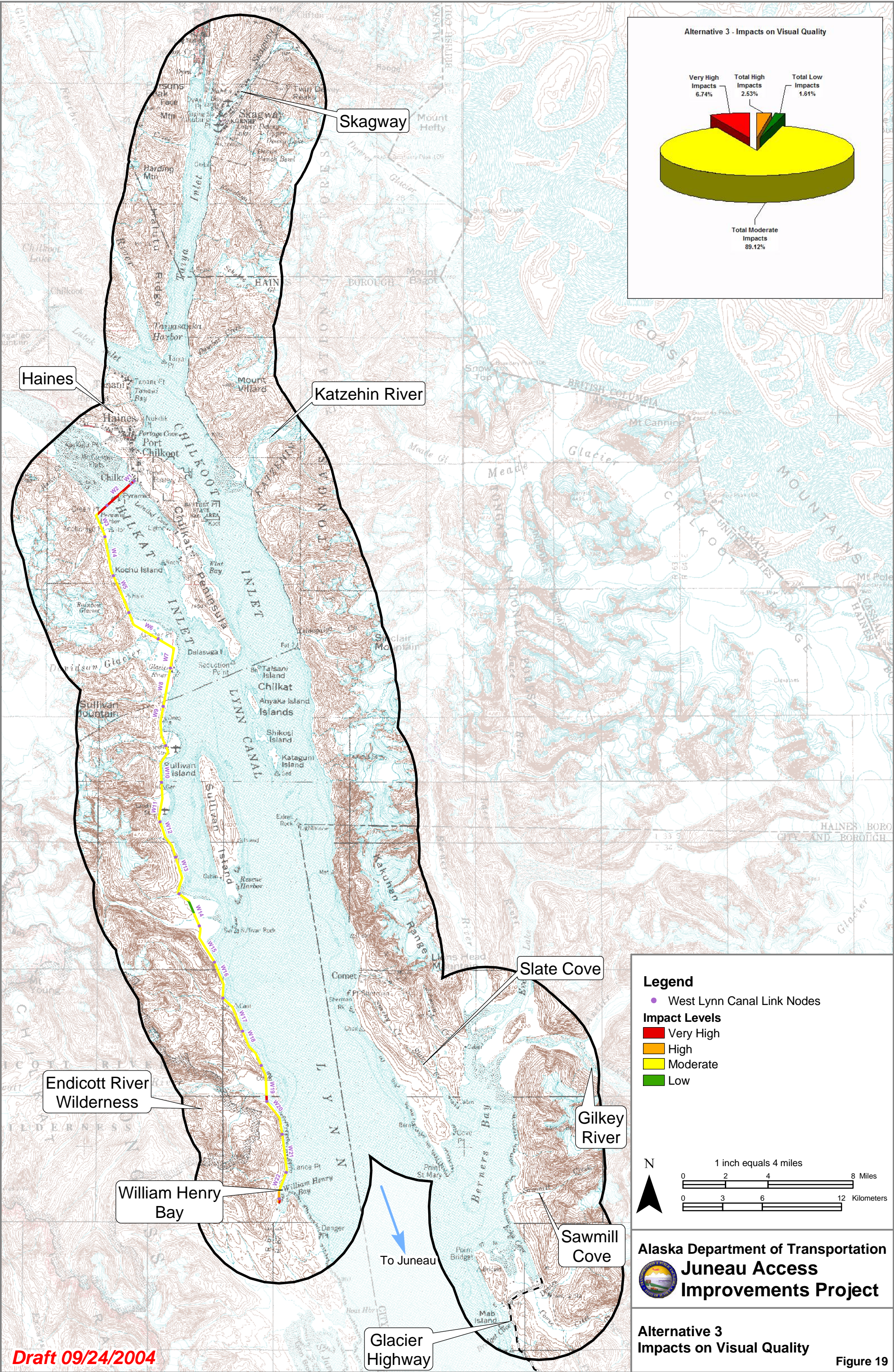


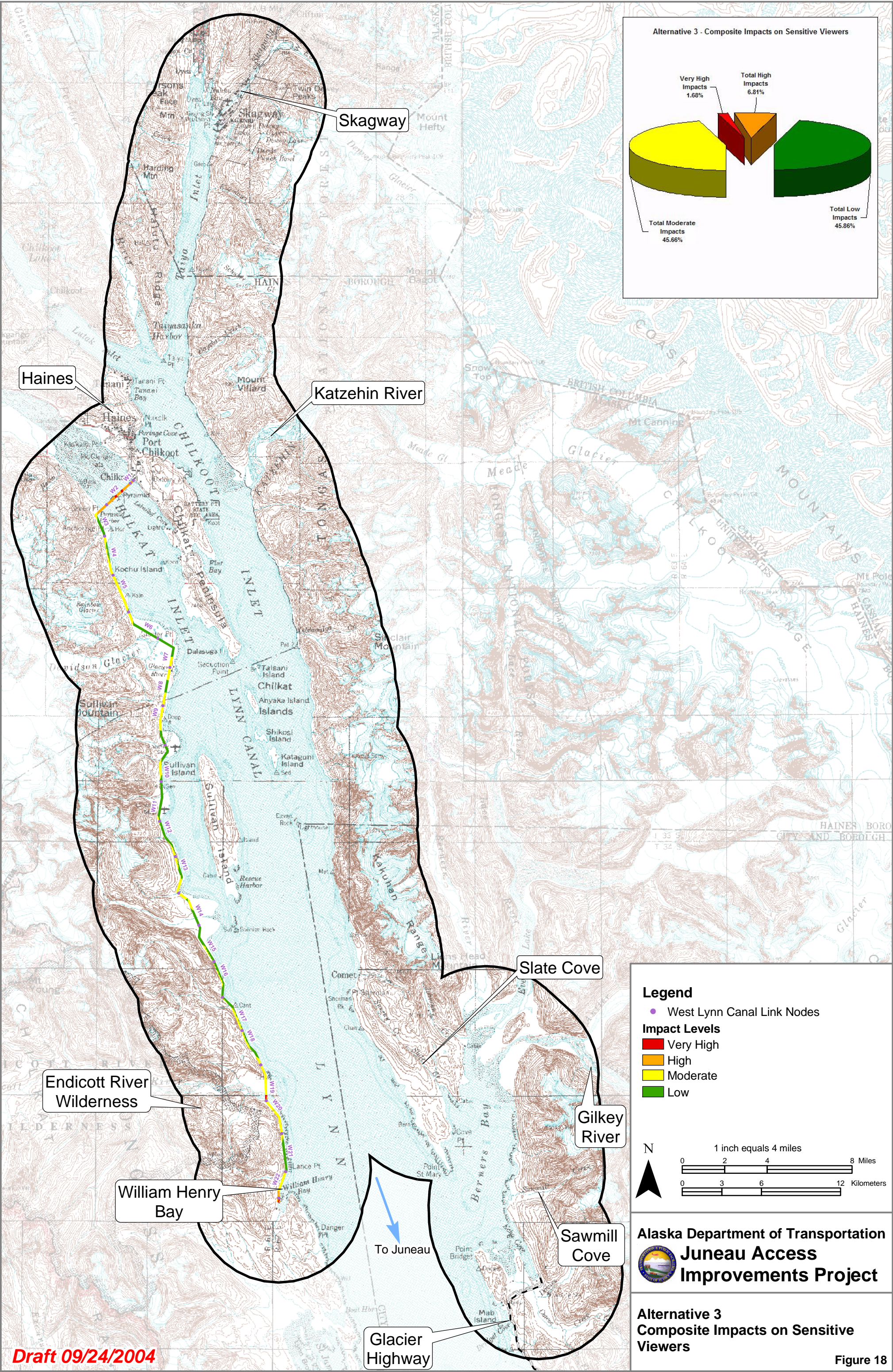


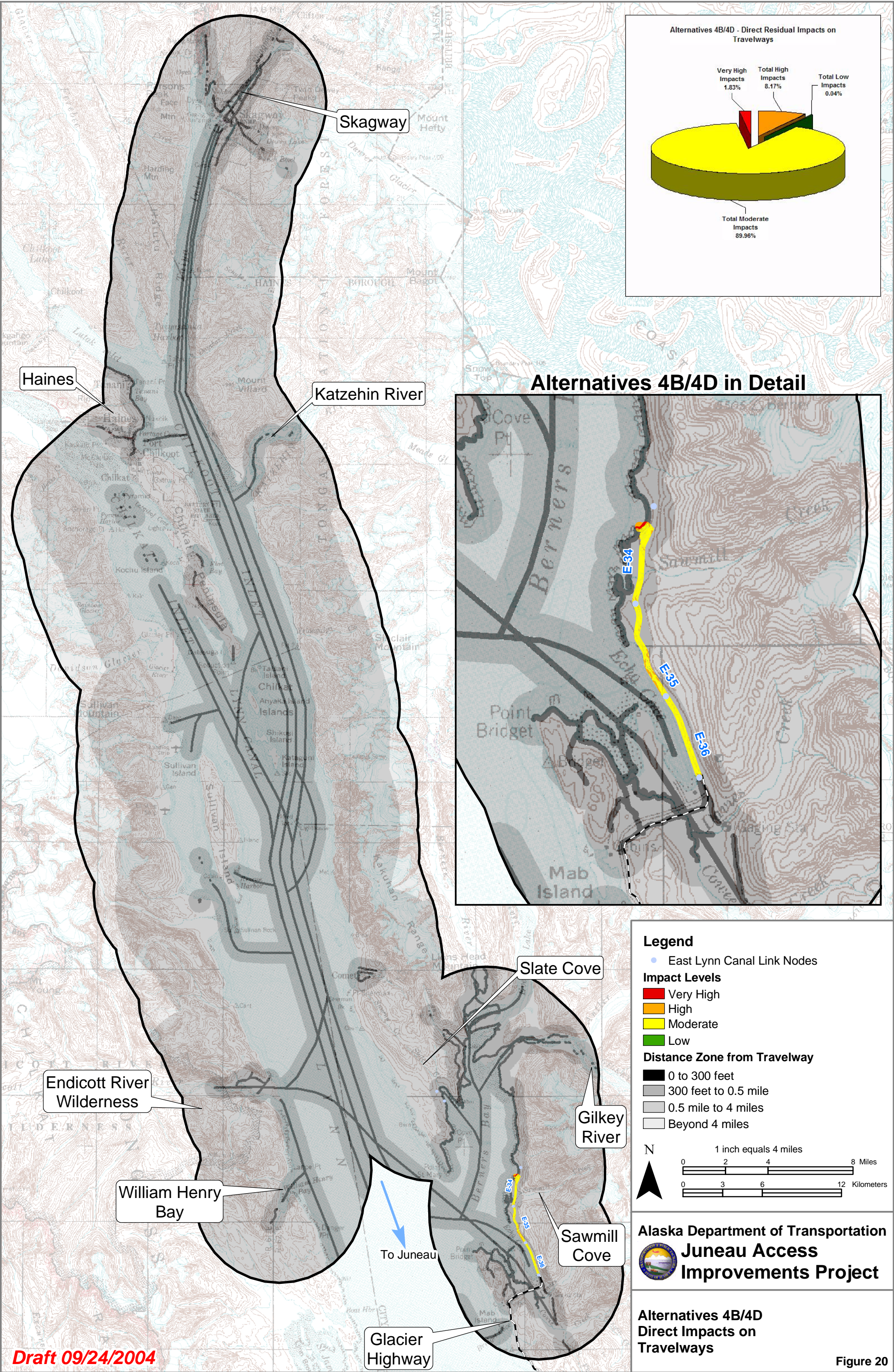


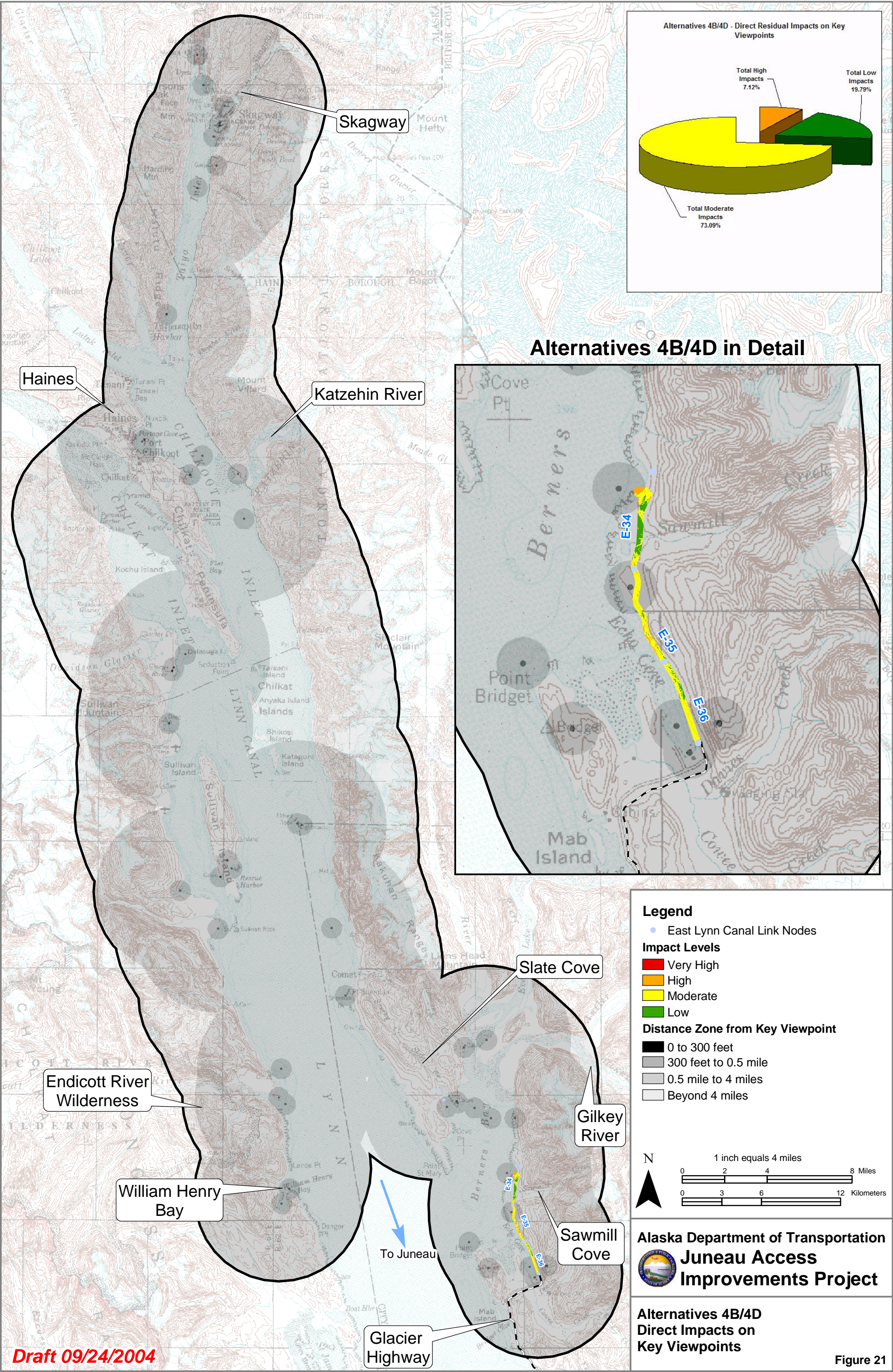


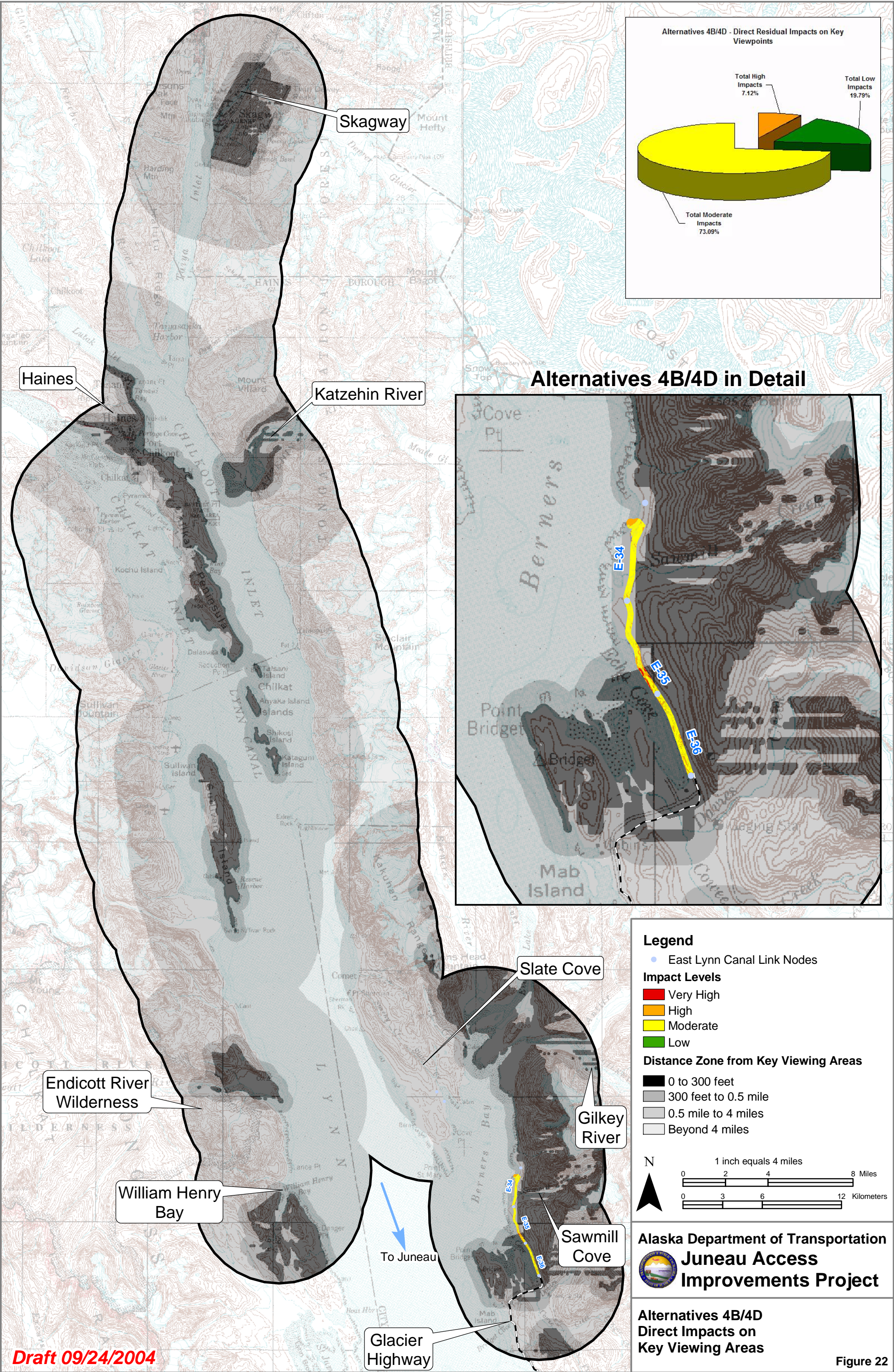


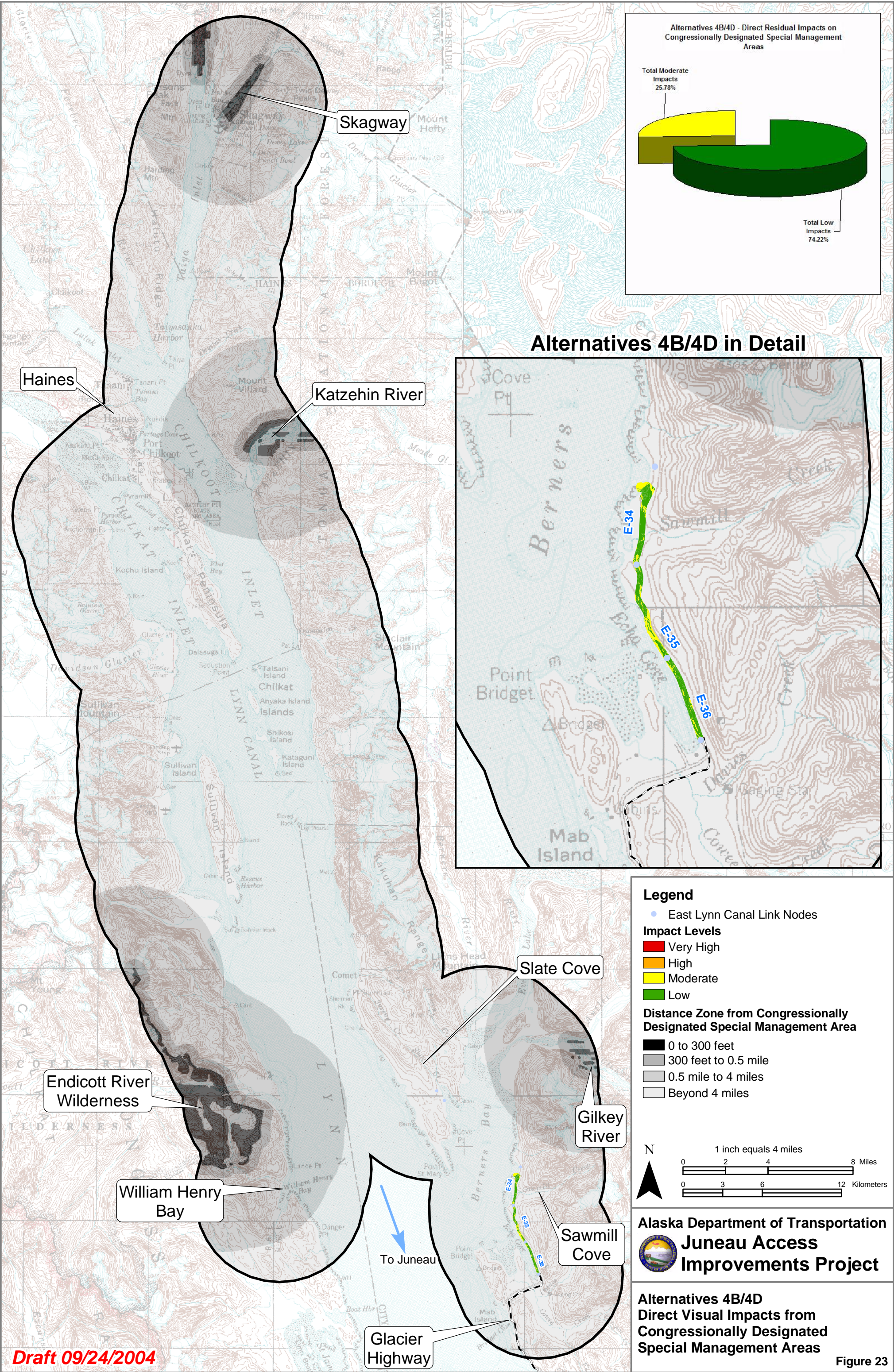


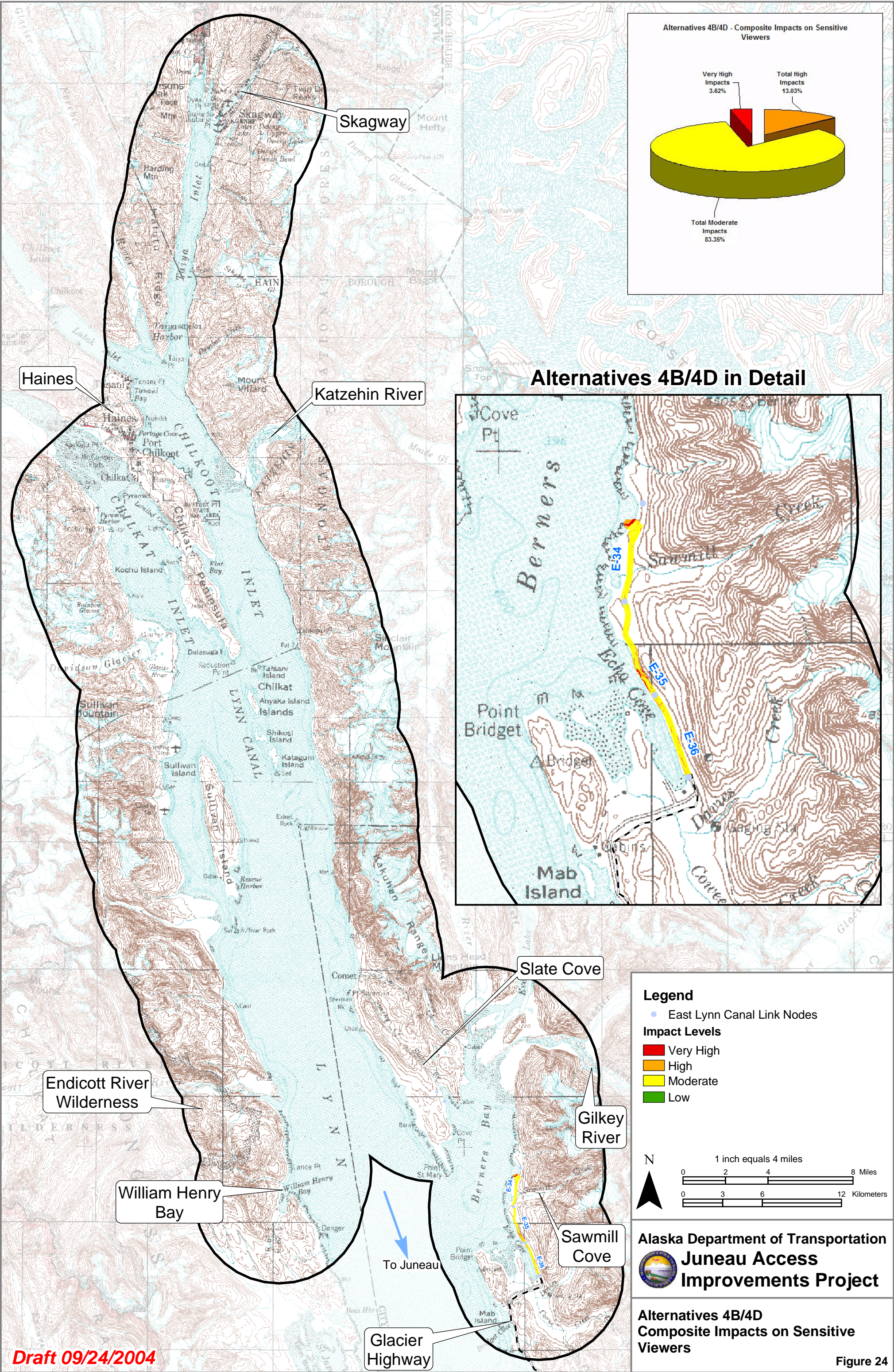












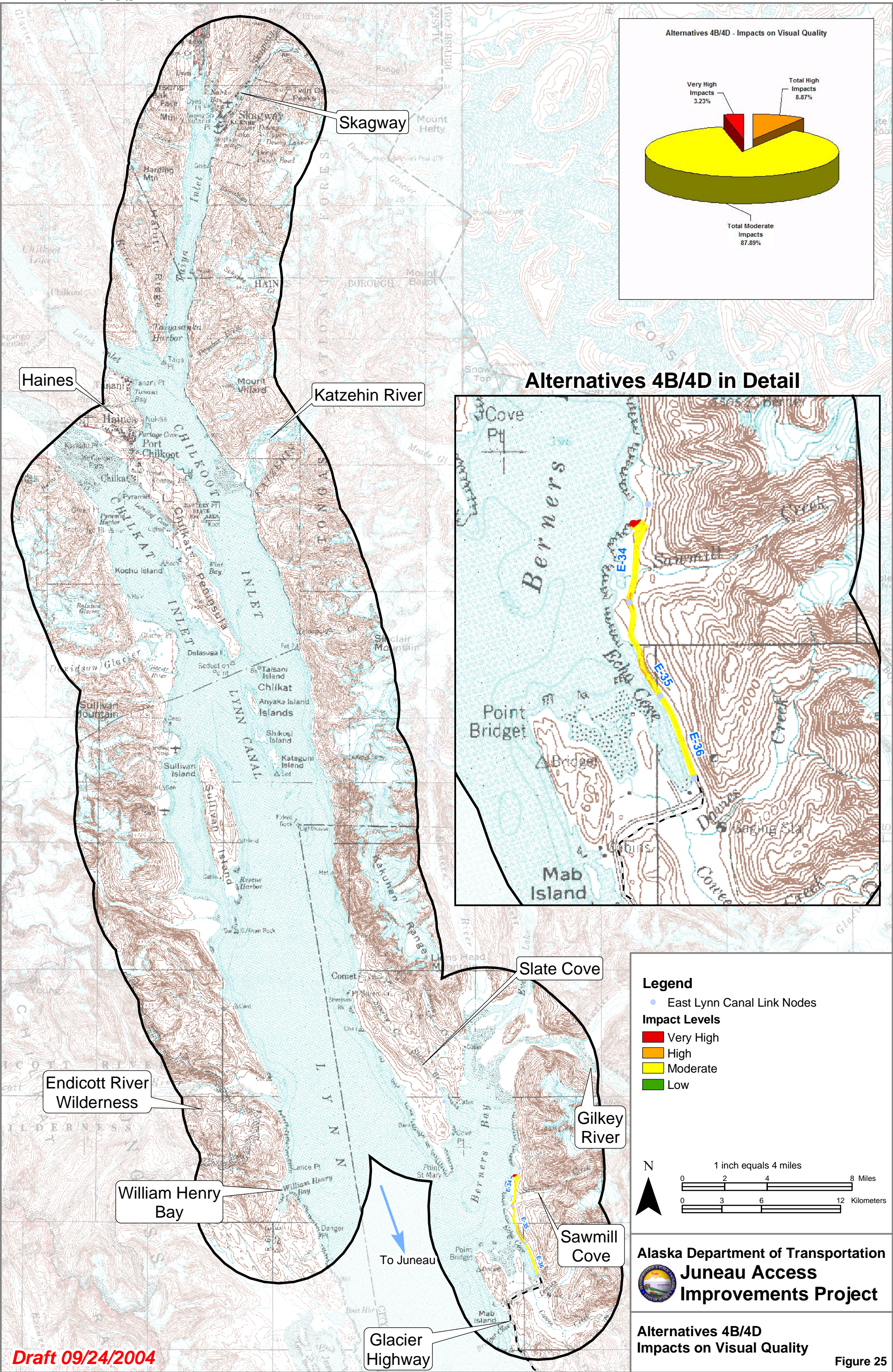
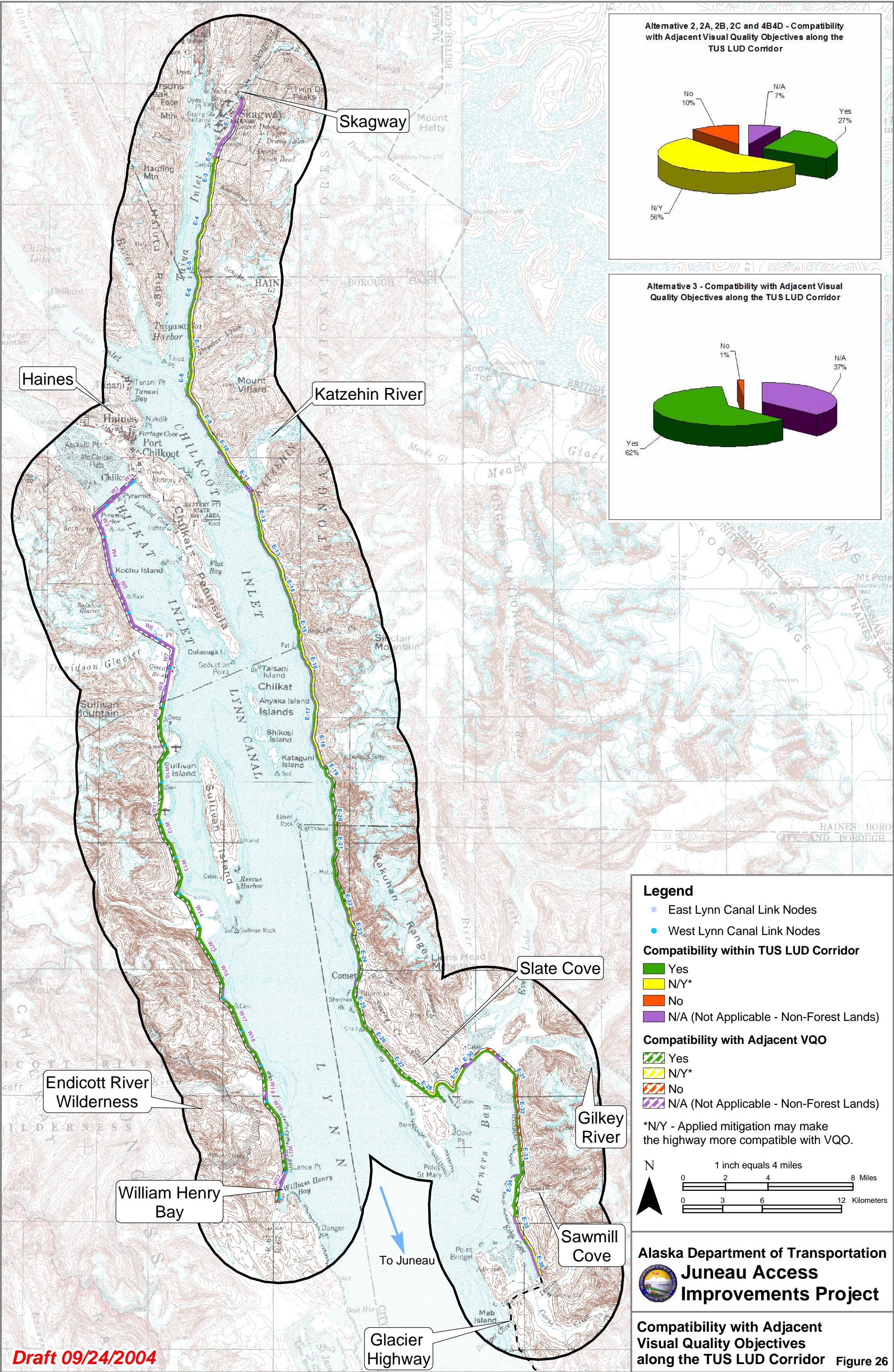


Figure 25



ATTACHMENT A
PHOTOGRAPHIC SIMULATIONS

READER'S NOTE REGARDING SIMULATIONS

Introduction

As stated previously, the simulations developed for the JAIP were used to verify the results of the impact prediction models (IPM) developed for this analysis related to spatial and scale dominance of the project facilities within a variety of settings. The simulations were not used to derive impact levels.

Information within the Simulations

All simulations were formatted identically. Depending on visibility factors used to employ the IPM (e.g., distance, landscape characteristics, existing visual conditions), information within each simulation varies with respect to the affected environment, environmental consequences, and compatibility with visual quality objectives. The following sections describes how the simulations were developed.

Development of Simulations

Each rendered photo realistic simulation consists of the existing condition (i.e., affected environment) and a simulation of what the highway may look like at selected sensitive viewpoints and viewing locations (i.e., environmental consequences). Sensitive viewpoints and viewing locations were selected by the National Park Service and Tongass National Forest. There were 21 simulations developed for the JAIP.

Photo/3D Model Composite Simulation

To ensure a high degree of visual accuracy in each simulation, Computer Aided Design (CAD) equipment and the use of Global Positioning Systems (GPS) allowed for life-size modeling within a computer. This translated to using real world scale and coordinates to locate facilities, other site data, and the actual camera locations corresponding to 3D simulation viewpoints. The degree of accuracy of the CAD equipment is absolute; the accuracy for the GPS location data was within approximately 1 meter, or 3.28084 feet.

MicroStation/AutoCad, 3D CAD, and GPS Data Integration

A CAD site map was imported as a background reference. MicroStation CAD drawings of proposed roadway engineering characteristics (e.g., roadway, cut-and-fill limits, elevation) were placed on top of the site map to register and orient the correct locations of the viewpoint simulated. Three-dimensional massing models of the facilities were generated in real world scale. The GPS camera positioning information was then referenced to the 3D data set.

Model View Professional/3D Studio Max/Adobe Photo Shop

An electronic camera lens matched the camera lens that was used in the field. A 35-millimeter camera with a 50-millimeter lens was used consistently throughout the process. This lens selection allowed for viewing of the computer-generated model in the same way that the proposed roadway would be viewed in the field.

Next, the photograph negative was scanned into the 3D database and loaded as an environment within which the view of the 3D model was generated. To generate the correct view relative to the actual photograph, the electronic camera was placed at a location (within the computer) from where the photograph was taken. This is supported by the GPS location. From here, the 3D wire frame model of the proposed roadway is displayed on top of the existing

terrain so that proper alignment, scale, angle, and distance can be verified. When lines of the wire frame model exactly match the photograph, the camera target position was confirmed.

To complete this phase, the sun angle was set, materials and textures were applied, and the composite image was rendered through a computer image process known as RayTracing. Any additional filters required for appropriate atmospheric conditions, such as blur/focus/haze etc., were applied at this time as required.

Inset Maps (along right edge of simulation)

Three inset maps are displayed along the right edge of the simulation. All have been produced using reduced Digital Raster Graphics (DRG) USGS maps at 1:63, 360 scale. None of the inset maps are to scale. Each inset map has been excerpted exactly from the scaled composite impact maps previously displayed in the main body of the analysis. Colors associated with a variety of analysis factors (e.g., impact levels, visual absorption capability levels, and Visual Quality Levels compatibility) vary within the 600' corridor analyzed. Depending on where the final alignment is selected these values would change. For this analysis worse-case values were calculated during the impact assessment phase.

The inset maps are labeled from top to bottom as follows: (1) affected environment, (2) environmental consequences, and (3) visual quality objectives. Following is a brief description of each inset map:

Affected Environment – This inset map describes the existing condition within a particular viewshed. The viewshed is defined as the area within the affected environment photograph. A directional arrow is labeled with an alphanumeric identifier (e.g., ELVP1) and points in the direction of the viewshed and represents the distance from the proposed roadway. The identifier label represents East Lynn View Point X or West Lynn View Point X depending on the alternative being simulated. The proposed roadway contains colors ranging from dark green to red representing the assessed visual absorption capability level. Text is provided in the left column of this inset map that describes 1) views most susceptible to impact, 2) the assessed visual absorption capability level, as well as 3) the assessed variety class. These factors were analyzed within the IPM to determine an expected level of impact.

Environmental Consequences – Similar cartographic images appear on this inset map as described in the previous section (i.e., directional arrow, base map, roadway alignment). The factors utilized in the IPM (e.g., distance, existing visual condition, visual absorption capabilities, etc.) were matrixed to determine a potential level of impact ranging from very high to low as shown in the key under the map. It should be noted that the impacts have not been mitigated. Depending on the nature of mitigation and the effectiveness of the mitigation, it may be possible to reduce impact levels. Text summarizing the potential level of impact is presented in the left column of this map.

Visual Quality Objectives – This inset map utilizes similar cartographic images as described previously. A determination of the compatibility with adopted Forest Service visual quality objectives is displayed within the TUS LUD as well as VQO adjacent to the TUS LUD. Four levels of determination were made for VQO within the TUS LUD and for VQO adjacent to the TUS LUD ranging from not compatible-to-compatible with the intermediate determination (i.e., unknown) being undecided in lieu of applied mitigation. The fourth category (purple) is land that does not have an adopted USDA Forest Service VQO assigned. Because the Forest Service rates compatibility of visual quality objectives in terms of the “noticeability of a project from the casual observer” there is a correlation between the level of impact predicted and the assessment of three levels of spatial and scale dominance ranging from a dominant feature to a

sub-ordinate feature with an intermediate level of co-dominant. The left column text of this inset map describes whether the proposed roadway would be compatible or not within the viewshed. Further, suggestions related to mitigation measures potentially reducing impact levels are described.

Viewshed Narrative Descriptions

Narratives are provided under each photograph. The affected environment text is a straightforward description of the distance the viewer is from the proposed roadway, significant visual features within the viewshed, and description of the natural or cultural features that create the visual fabric within the viewshed.

The text under the environmental consequences photograph (i.e., simulation) describes what features of the proposed roadway impact the viewshed and to what degree these impacts may be noticeable. As previously stated and consistent with terminology used within the Visual Management System (1974), three levels of noticeability describe a potential level of change within a specific viewshed. Also, as stated previously, there exists a direct correlation between the level of impact potentially anticipated and the level of dominance (or lack of) assessed. There were several factors considered in the conclusions of project dominance as follows:

- distance a viewer is from the highway
- existing visual condition within the landscape setting
- visual absorption capability levels assessed along the proposed roadway
- assessed variety class (or visual quality) of the existing setting

It should be noted that visual quality objectives were not used in the derivation of impact levels or dominance assignments. Visual quality objectives were used to identify areas that are more or less compatible with the proposed roadway. The following definitions are used, in part, by the Forest Service in the evaluation of noticeability or dominance:

From: National Forest Landscape Management, Vol. 1, Ag Handbook 434, USDA-FS, 1973

Dominance – Dominant position in an order of forcefulness

Dominant – Ruling, governing, predominant, exercising great influence

Co Dominance – Two dominating features of relative equal visual importance in one scene

Subordinate – Inferior to or placed below another in size, brightness, etc., secondary in visual impact.

From: U.S. Department of Agriculture, Forest Service, USDA Handbook 701 (as revised). A Handbook for Scenery Management, 1996.

Dominance Elements – In scenery management, the dominance elements are form, line, color, and texture. They are attributes that make up the landscape character.

Dominant Human Alterations – In scenery management, dominant human alterations override the natural character of the landscape and are very noticeable.

Subordinate – Landscape features that are inferior to, or placed below, another in size, importance, brightness, and so on. Features that are secondary in visual impact or importance.

Conclusion

In conclusion, both natural features and the influence of man-made features were considered within this analysis. Dependent on the variables discussed above, a level of impact was assigned along all portions of the proposed roadway alignments. Because it is impossible to capture every viewpoint under every viewing condition, simulations were developed that depict a typical range of reasonable viewing conditions from key viewpoints. Because a correlation exists between an assessed impact level and the description of that impact level in terms of dominance, viewpoints not simulated can be expected to have similar noticeability characteristics as the simulated viewpoints by referencing the assessed impact level. For example, an unsimulated viewpoint assessed with an impact level of low would be assessed a noticeability indicator of subordinate whereas a very high impact level would be considered an area of high noticeability or a dominant feature within the existing setting.

Attachment A Photographic Simulations

View from Dyea Inlet	ELVP1
Skagway Scenic Overlook	ELVP1.5
View from Skagway	ELVP2
View from Skagway Harbor	ELVP3
View from Taiya Inlet	ELVP4
View from Haines	ELVP5
View from Chilkoot Inlet	ELVP6
View of Katzeihin River Valley	ELVP7
View from Eldred Lighthouse	ELVP8
View of Kakuhan Range	ELVP9
View from Sherman Point	ELVP10
View of Slate Cove	ELVP11
View of Lace, Antlers, and Berners Rivers	ELVP12
View of Berners Bay Eastern Shoreline	ELVP13
View of Sawmill Cove	ELVP14
View from Point Bridgett	ELVP15
View of Pyramid Island	WLVP1
View of Davidson Glacier	WLVP2
View of Endicott River	WLVP3
View of William Henry Mountain	WLVP4
View from William Henry Bay	WLVP5

AFFECTED ENVIRONMENT



This viewpoint is 5 miles from the highway, within the Dyea Inlet. Significant visual features within the viewshed include the Dyea flatlands, and the Taiya Inlet and associated steep coastline. Mount Villard is apparent in the distant background. The side slope extent of the tree line, where juxtaposed against the uppermost barren mountain slopes, provides a striking contrast of color, line, and texture within the setting. The existing Dyea road and associated road cuts can be seen on the left side of the photograph, within the middleground threshold.

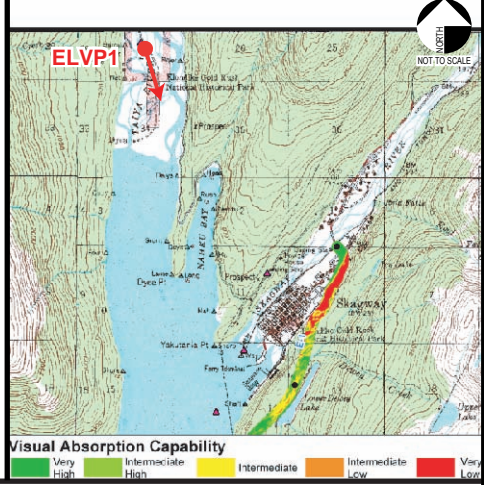
ENVIRONMENTAL CONSEQUENCES



Although not substantially dominant within the natural setting when viewed at this distance, the highway would be discernable as a ribbon along Taiya Inlet. Modifications to the physical landform exposing the subsoil and rock would create a contrast of line and color; form and texture changes would be less dramatic. At this distance, the highway would appear as a subordinate linear feature for several miles along the inlet, similar to the changes associated with the existing Dyea Road, apparent in the middleground of the photograph.

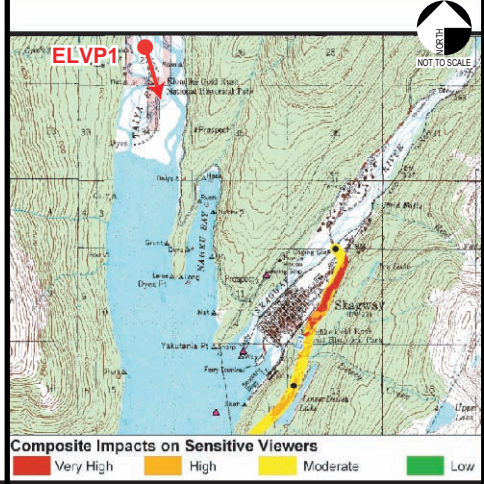
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen by visitors within the Dyea Inlet Delta.
- 2) Visual Absorption Capability - very low.
- 3) Variety Class - B



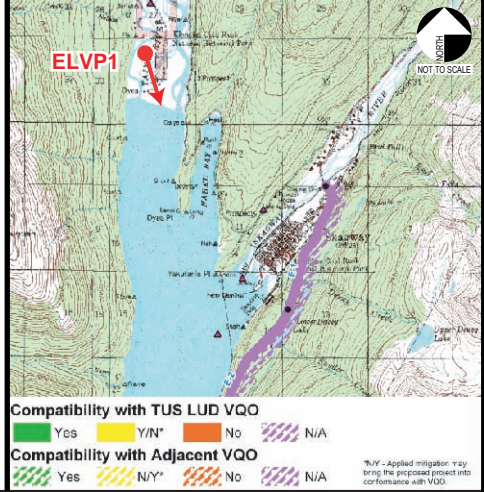
ENVIRONMENTAL CONSEQUENCES


Impacts associated with this portion of the highway would range from high to moderate levels.



VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. Depending on the final alignment and design of the highway the adjacent adopted VQOs may or may not be met.





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Visual Simulation of Alternatives 2, 2A, and 2C from Dyea Inlet Looking Southeast

ELVP1

AFFECTED ENVIRONMENT



This viewpoint is located approximately six-tenths of a mile from the highway at a popular vista point along Dyea Road overlooking Skagway. Topography traversed by the highway is very steep. Cultural modifications within the viewshed are primarily associated with Skagway.

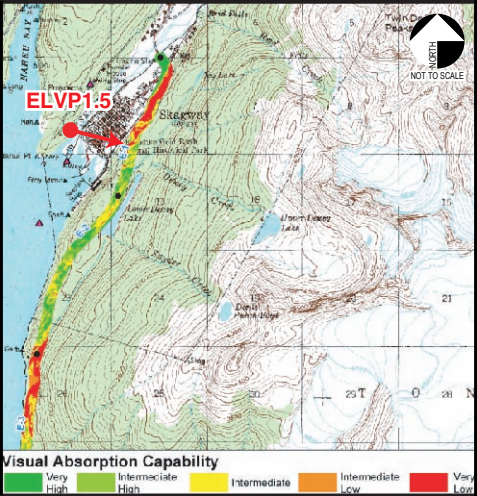
ENVIRONMENTAL CONSEQUENCES



Under this alternative, large and continuous cuts would insert a distinct linear feature into the existing setting. The form, line, color and texture of the highway would be a noticeable contrast within the natural landscape, and would likely make the highway a dominant feature within this viewshed.

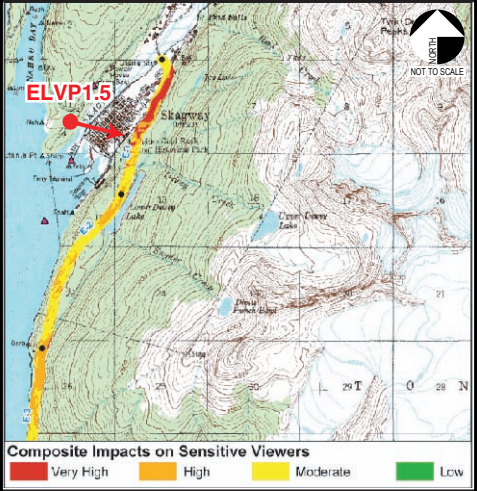
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen by residents of Skagway, tourists, and visitors within recreation areas and cultural sites.
- 2) Visual Absorption Capability - very high to very low.
- 3) Variety Class - A



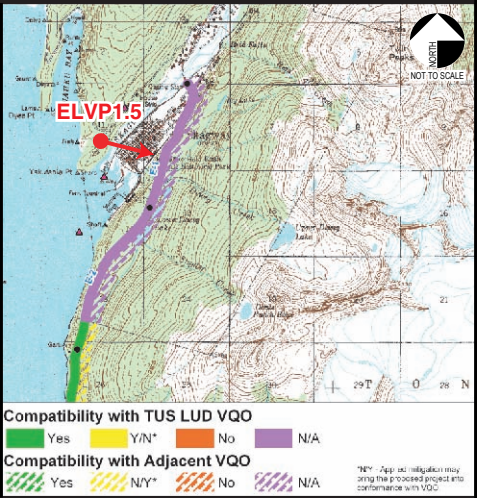
ENVIRONMENTAL CONSEQUENCES


Impacts associated with this portion of the highway would range from very high to high levels.



VISUAL QUALITY OBJECTIVES

The highway does not affect Forest System Lands; therefore VQOs are not applicable.





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Visual Simulation of Alternatives 2, 2A, and 2C from Dyea Road Looking East

ELVP1.5

AFFECTED ENVIRONMENT



This viewpoint is six-tenths of a mile from the highway, within the vicinity of the Skagway Airport. The topography is very steep and covered by a continuous-canopy forest. The Historic Ships' Registry is visible from this viewpoint. Cultural modifications within the viewshed primarily include commercial and industrial facilities that support both the airport and tour ship operations.

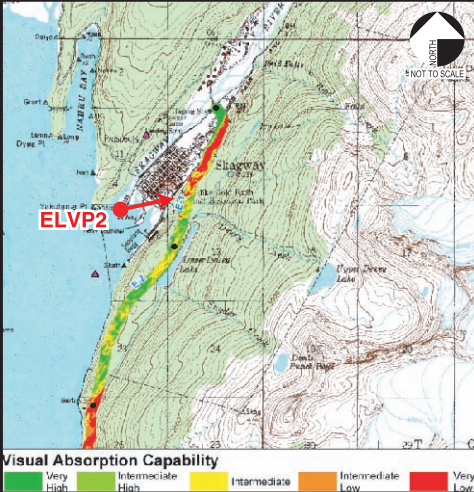
ENVIRONMENTAL CONSEQUENCES



Large and continuous cuts are anticipated which will create a distinct linear feature within the existing setting. It is likely that the roadway will create changes to form, line, color, and texture natural characteristics, which may result in the highway becoming a co-dominant feature within this viewshed, when considered with other features within the photograph (e.g., tour ships, airport facilities, etc.).

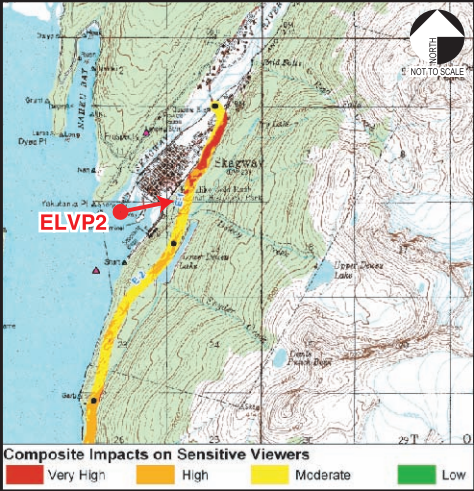
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen by residents of Skagway, tourists, and visitors within recreation areas and cultural sites.
- 2) Visual Absorption Capability - very high to very low.
- 3) Variety Class - A



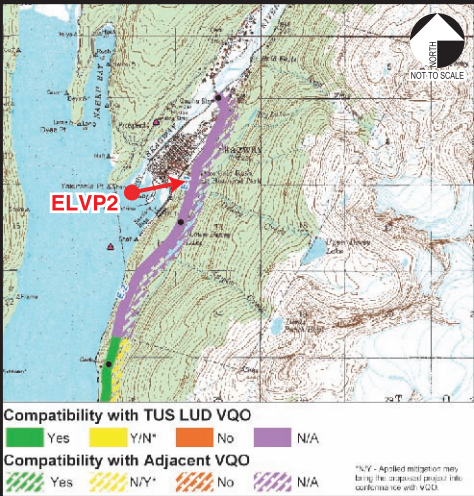
ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from very high to high levels.



VISUAL QUALITY OBJECTIVES

The highway does not affect Forest System Lands; therefore VQOs are not applicable.





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Visual Simulation of Alternatives 2, 2A, and 2C from Skagway Airport Looking East

ELVP2

AFFECTED ENVIRONMENT



This viewpoint is one-half mile from the highway. Mount Clifford, the Sawtooth Range, and the Twin Dewey Peaks form the background. Cultural modifications within the landscape include cruise ships, the Skagway Harbor, and other built facilities within Skagway.

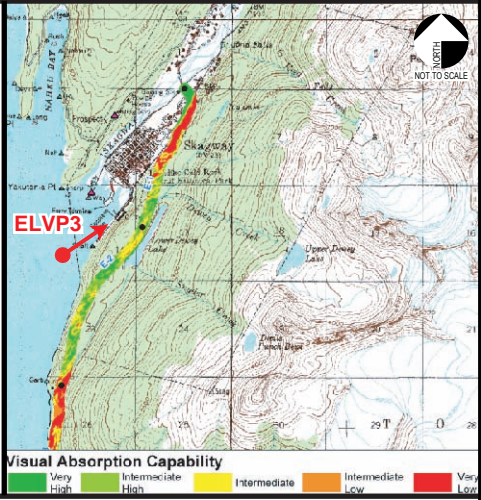
ENVIRONMENTAL CONSEQUENCES



Because this viewshed can be characterized as a forced focal point, the highway is likely to be noticeable. The contrast created by exposing lighter subsurface material-as well as the distinct line created through an otherwise homogeneous vegetative cover-would result in moderate to very high levels of impact. It is likely that the highway would be considered a co-dominant feature when considered together with other features within the landscape (such as cruise ships).

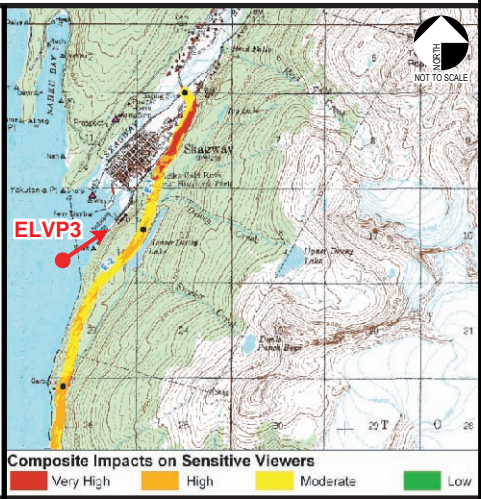
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.
- 2) Visual Absorption Capability - very low.
- 3) Variety Class - B



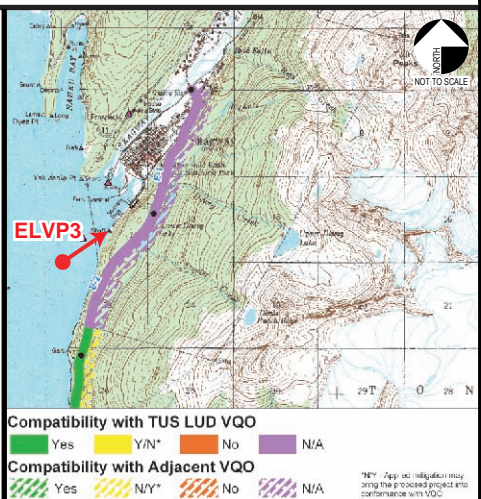
ENVIRONMENTAL CONSEQUENCES


Impacts associated with this portion of the highway would range from moderate to very high levels.



VISUAL QUALITY OBJECTIVES

The highway does not affect Forest System Lands; therefore VQOs are not applicable.





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Juneau Access Improvements Project

Visual Simulation of Alternatives 2, 2A, and 2C from Taiya Inlet South of Skagway Looking North

ELVP3

AFFECTED ENVIRONMENT



This viewpoint is six-tenths of a mile from the highway. It represents a characteristic view that would be experienced by a traveler along the Taiya Inlet. Steep cliffs of exposed rock outcroppings create interest within the viewshed. Textural and color features include a mostly closed-canopy forest, punctuated by intermittent areas of exposed rock.

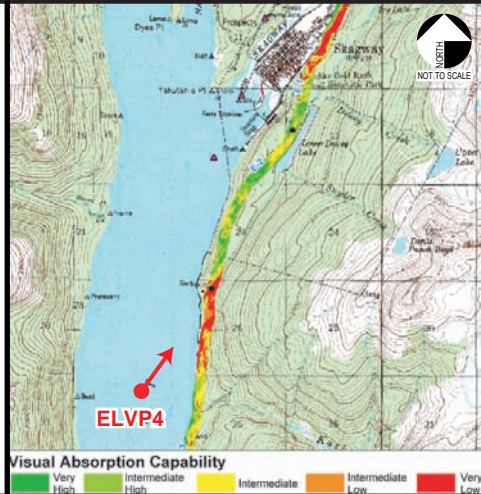
ENVIRONMENTAL CONSEQUENCES



This simulation represents a view looking towards the highway which would, in this alternative, be sited about 60 to 80 feet above the water surface. Travelers within the Taiya Inlet would have foreground perpendicular views of the highway, as well as forced enclosed focal views of the middleground and background viewing thresholds. Within the Taiya Inlet, the highway would dominate the existing setting in foreground and middleground thresholds, and be co-dominant within the background threshold.

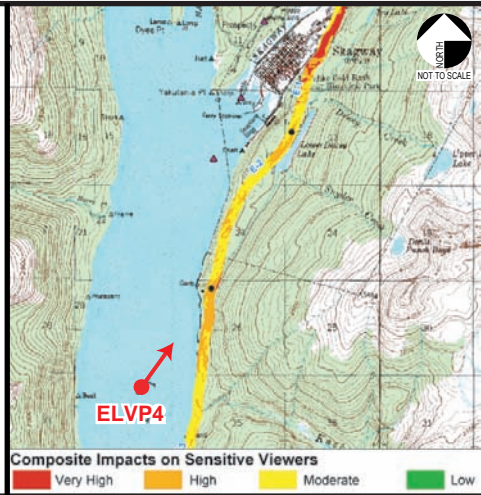
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.
- 2) Visual Absorption Capability - very low.
- 3) Variety Class - B



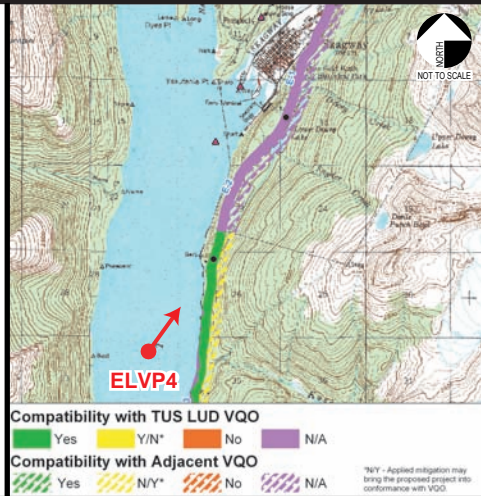
ENVIRONMENTAL CONSEQUENCES


Impacts associated with this portion of the highway would range from moderate to high levels.



VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. Depending on the final alignment and design of the highway the adjacent adopted VQOs may or may not be met.





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Visual Simulation of Alternatives 2, 2A, and 2C from Taiya Inlet Near Mount Harding Looking East

ELVP4

AFFECTED ENVIRONMENT



This viewpoint is 2.8 miles from the highway. The photograph was taken from within Haines Harbor toward Mount Villard. Cultural modifications are essentially absent within the viewshed.

ENVIRONMENTAL CONSEQUENCES



A distinct ribbon around the base of Mount Villard, as well as along the Taiya Inlet, would be noticeable. The highway would be sited 60 to 80 feet above the water surface, in a closed-canopy forest with intermittent areas of exposed rock. It is expected that the light linear band created by exposing subsurface soil may be noticeable at this distance, but would not compete substantially with the existing natural setting (i.e. it would be co-dominant).

AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by residents of Haines, tourists, and visitors within recreation areas.

2) Visual Absorption Capability - very low to very high.

3) Variety Class - B

ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from moderate to high levels.

VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. Depending on the final alignment and design of the highway the adjacent adopted VQOs may or may not be met.

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Juneau Access Improvements Project

Visual Simulation of Alternatives 2, 2A, and 2C from Chilkoot Inlet Near Port Chilkoot Looking East

ELVP5

AFFECTED ENVIRONMENT



This viewpoint is seven-tenths of a mile from the highway. It includes a view of Katzehin River delta (portions farther east of the highway are proposed as wild and scenic). Extreme topographic variances typify this setting, as the mountainous terrain sharply meets the water's edge. The Katzehin Delta adds an additional layer of visual interest to this setting.

ENVIRONMENTAL CONSEQUENCES



From this viewpoint, the highway would be in the middleground viewing threshold. The highway (for Alternatives 2, 2A, 2B, and 2C) would appear as a linear band along the base of Mount Villard. The proposed ferry terminal (under Alternatives 2, 2A, 2B, and 2C) would be noticeable, related to the interruption in the existing setting created by the line of the highway; but this would be considered a subordinate element within the natural setting. The existing natural setting dominates viewsheds, and it is likely that the highway would be a co-dominant feature in relationship to the existing setting.

AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.

2) Visual Absorption Capability - very low to intermediate.

3) Variety Class - A/B

Visual Absorption Capability

- Very High
- High
- Intermediate
- Low
- Very Low

Impacts associated with this portion of the highway would range from moderate to high levels.

Composite Impacts on Sensitive Viewers

- Very High
- High
- Moderate
- Low

VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. Depending on the final alignment and design of the highway the adjacent adopted VQOs may or may not be met.

Compatibility with TUS LUD VQO

- Yes
- N/A
- No
- N/A

Compatibility with Adjacent VQO

- Yes
- N/A
- No
- N/A

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Juneau Access Improvements Project

Visual Simulation of Alternatives 2 through 2C and Katzehin Ferry Terminal from Lynn Canal at Katzehin Delta Looking East

ELVP6

AFFECTED ENVIRONMENT



This viewpoint is one-half mile from the highway. The existing setting is one of steep mountains juxtaposed with the delta flatlands and river valley of the Katzehin River.

ENVIRONMENTAL CONSEQUENCES



From this viewpoint, a marine traveler within the Chilkoot Inlet in the vicinity of the Katzehin River would likely notice a co-dominant linear band created by the exposure of lighter soils, as well as a subordinate bridge spanning the river headwater. Although the proposed bridge would be noticeable, the scale of both the landform and the vegetation modification would be less than that of cut and fill areas constructed on mountain slopes (depicted on the right side of the simulation). Southbound marine travelers would not notice this portion of the highway to the same degree as northbound marine travelers approaching the river headwaters. This is based on the forced focal point perspective that occurs as the inlet turns to a more northwesterly direction than a northerly direction. Given the dominant natural features within the viewshed, it is likely that the highway would have a co-dominant feature within the existing natural setting.

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AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.

2) Visual Absorption Capability - very high to very low.

3) Variety Class - A/B

Visual Absorption Capability

Very High	Intermediate	Intermediate	Low	Very Low
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ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from moderate to very high levels.

Composite Impacts on Sensitive Viewers

Very High	High	Moderate	Low
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VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. However, for VQOs immediately adjacent to the TUS LUD the highway would deviate so greatly from form, line, color, and texture elements within the existing natural setting that it is not likely to be compatible with the adjacent adopted VQO.

Compatibility with TUS LUD VQO

Yes	Y/N*	No	N/A
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Compatibility with Adjacent VQO

Yes	N/Y*	No	N/A
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*N/A - App. as mitigation may bring the proposed project into compliance with VQO.

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Juneau Access Improvements Project

Visual Simulation of Alternatives

2 through 2C from Lynn Canal South of Katzehin River Looking East

ELVP7

AFFECTED ENVIRONMENT



This viewpoint is 1.5 miles from the highway. The existing setting is visually interesting, with changes in color of vegetation, the lively presence of waterfalls and rock slides, steep mountainous terrain juxtaposed with glacier valleys at higher elevations, and exposed rock-outcroppings.

ENVIRONMENTAL CONSEQUENCES



From this viewing distance, the strong linear feature of the highway within the natural setting would be readily apparent to a traveler within Lynn Canal. Some portions of the highway would be sited close to the water's edge, thus reducing visibility of this linear band as it blends more naturally with features along the coastline. In other areas, the highway would be sited 60 to 80 feet above the water's surface and would traverse areas of extreme slope, including noticeable, sheer-cut faces. The existing natural setting can be characterized as one that dominates the viewshed. However, at close distances the highway may become a co-dominant feature along this portion of the corridor, and from background distances, a more subordinate feature.

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AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by tourists, and visitors within recreation areas.

2) Visual Absorption Capability - very high to very low.

3) Variety Class - B

ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from low to high levels.

VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. The highway would also be compatible with adopted adjacent VQOs.

Juneau Access Improvements Project

Visual Simulation of Alternatives
2 through 2C from Lynn Canal
at Eldred Rock Looking East

ELVP8

AFFECTED ENVIRONMENT



This viewpoint is nine-tenths of a mile from the highway. The landscape setting transitions from very steep topography (rock outcroppings meeting the water's edge) interspersed with vegetation, to less-steep, rolling hills (set back from the water's edge) covered by continuous, closed-canopy forest. Glacier valleys, exposed side-slope mountain rock, and jagged peaks add to the visual interest of this setting.

ENVIRONMENTAL CONSEQUENCES



Along this portion of the highway, the existing topography and vegetation would help prevent the highway from becoming a severely competitive feature, as was discussed, within the existing setting. Along, for example the Taiya Inlet. However, it is likely that the highway, in this location and from this distance, may become a co-dominant feature within the existing natural setting.

AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.

2) Visual Absorption Capability - intermediate to very high.

3) Variety Class - B

Visual Absorption Capability

Very High	Intermediate	Intermediate	Low	Very Low
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ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from moderate to low levels.

Composite Impacts on Sensitive Viewers

Very High	High	Moderate	Low
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VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. Depending on the final alignment and design of the highway the adjacent adopted VQOs may or may not be met.

Compatibility with TUS LUD VQO

Yes	N/A	No	N/A
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Compatibility with Adjacent VQO

Yes	N/A	No	N/A
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*N/A - Applied mitigation may bring the original project into conformance with VQO.

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Juneau Access Improvements Project

Visual Simulation of Alternatives

2 through 2C from Lynn Canal North of Comet Looking East

ELVP9

AFFECTED ENVIRONMENT



The viewpoint is three-tenths of a mile from the highway. The viewshed is quite unique within the VSOI as it affords viewing opportunities of distinct and layered foreground, middleground, and background landscape units (coastline to mountain peaks as interrupted by rolling foothills).

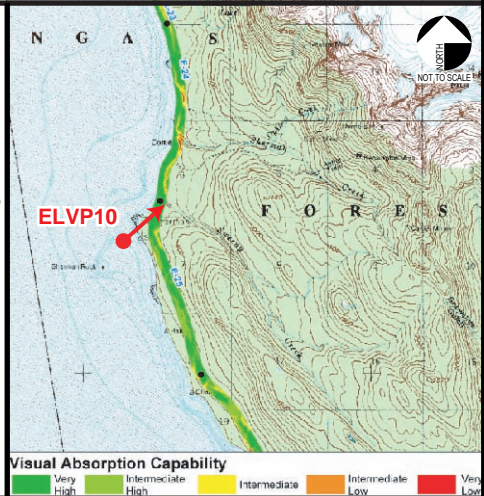
ENVIRONMENTAL CONSEQUENCES



In an area of gentler topography, the visibility of cut-and-fill areas would be reduced. However, the linear banc created by the removal of vegetation would be noticeable, primarily in the middleground and foreground viewing thresholds. It is likely that the highway would be a co-dominant to subordinate feature within the existing natural setting.

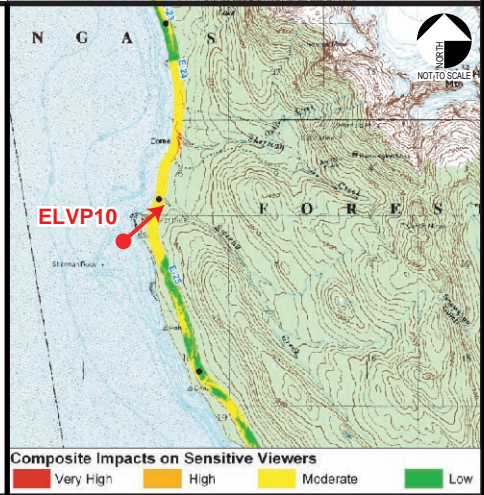
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.
- 2) Visual Absorption Capability - intermediate to very high.
- 3) Variety Class - A/B



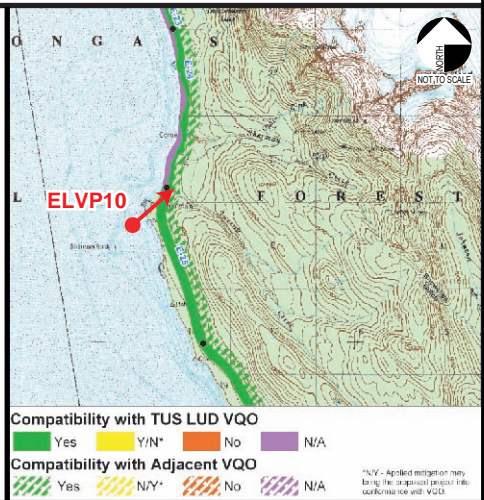
ENVIRONMENTAL CONSEQUENCES


Impacts associated with this portion of the highway would range from moderate to low levels.



VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. The highway would also be compatible with adopted adjacent VQOs.





Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternatives

2 through 2C from Lynn Canal at Sherman Point Looking East

ELVP10

AFFECTED ENVIRONMENT



This viewpoint is approximately six-tenths of a mile from the highway in the vicinity of the proposed Slate Cove Ferry Terminal within Berners Bay. The existing setting is not as visually interesting as previously discussed settings. This is due to a very homogeneous vegetative cover occurring on relatively flat to moderately rolling terrain. Middleground and background layering of landscape components is not attributable within this perspective.

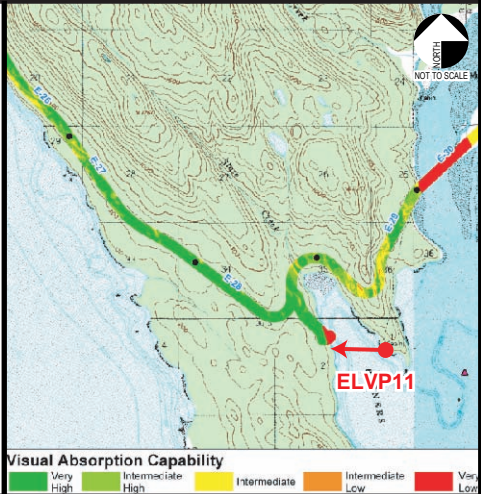
ENVIRONMENTAL CONSEQUENCES



The highway would traverse very gentle terrain through a continuous, closed-canopy forest. Although the visibility of cut-and-fill areas would be reduced because of the terrain's characteristics, the removal of vegetation would nevertheless create a distinct line across this small peninsula. Moreover, changes to the natural, rounded-form characteristics would be noticeable by marine travelers viewing the highway at a perpendicular angle, as the highway would create a distinct notch in the canopy as it crests over the peninsula. The highway (for Alternatives 2, 2A, 2B, and 2C) and proposed ferry terminal (for Alternative 2A) are more likely to be subordinate to co-dominant features (respectively) within the existing natural setting.

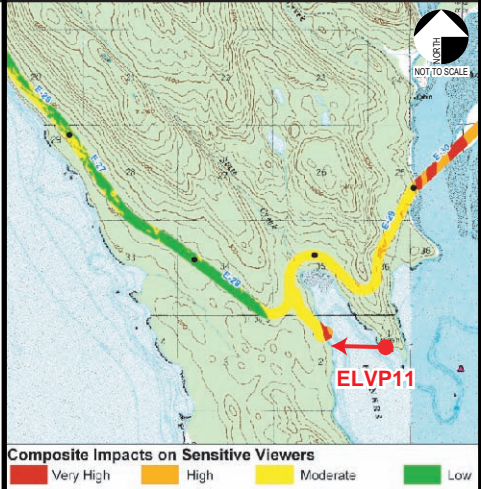
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen from tourists and visitors within recreation areas.
- 2) Visual Absorption Capability - very low to very high.
- 3) Variety Class - B



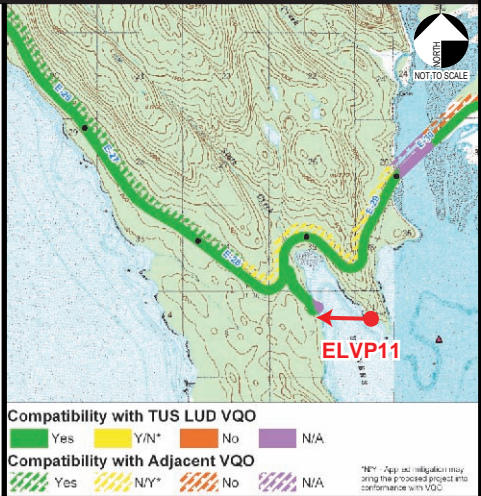
ENVIRONMENTAL CONSEQUENCES


Impacts associated with this portion of the highway would range from moderate to very high levels.



VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. Depending on the final alignment and design of the highway the adjacent adopted VQOs may or may not be met.





Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternative 2A from Berners Bay at Slate Cove Looking North

ELVP11

AFFECTED ENVIRONMENT



This viewpoint is 2.2 miles from the highway. The existing setting is one of the most visually interesting along the East Lynn Canal Alternative. Layering of distinct landscape units is well defined within the viewshed. Distance background views of snowcapped mountains, and middleground and background views of similar forms provide added textural and color elements to the setting. Foreground views of delta flatlands and river valleys create extreme visual interest within the setting.

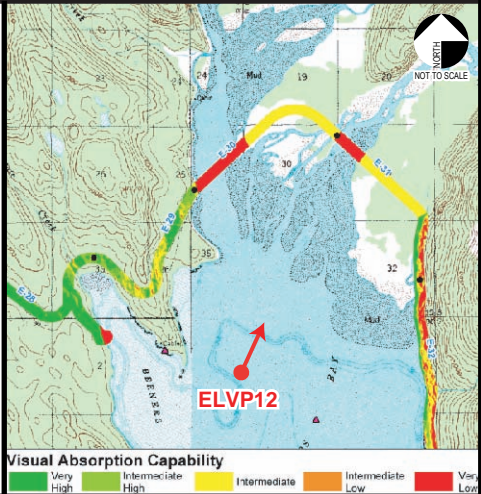
ENVIRONMENTAL CONSEQUENCES



Viewers within Berner's Bay, primarily those accessing the Lace, Antlers, and Berners Rivers, would notice the highway. The proposed bridge (for Alternatives 2, 2B, and 2C) would create form contrast, However, the bridge would be more or less noticeable depending on the angle and the distance of the view.

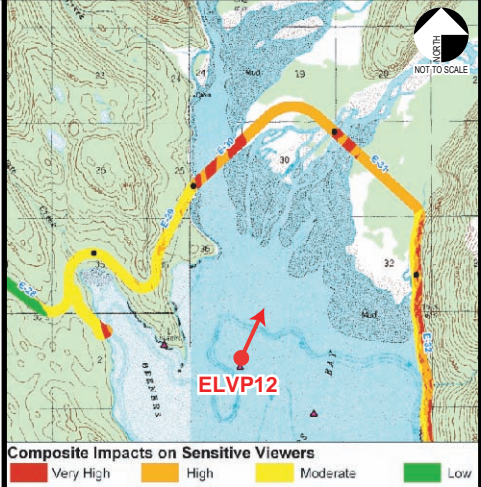
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.
- 2) Visual Absorption Capability - very low to intermediate.
- 3) Variety Class - A



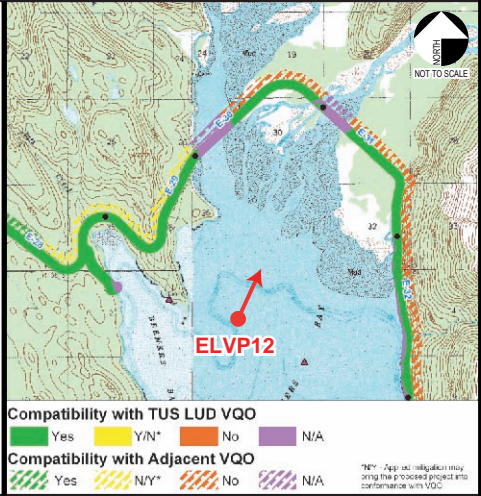
ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from high to very high levels.



VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. However, for VQOs immediately adjacent to the TUS LUD the highway would deviate so greatly from form, line, color, and texture elements within the existing natural setting that it is not likely to be compatible with the adjacent adopted VQO.





Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternatives 2, 2B, and 2C from Berners Bay at Antler, Lace, and Berners River Delta Looking North

ELVP12

AFFECTED ENVIRONMENT



This viewpoint is eight-tenths of a mile from the highway. Topography within this area varies from gentle to moderately steep. The layering of landscapes surrounding primarily all but the central western portion of the bay dominates existing viewsheds and is considered by the Forest Service as a scenic viewshed LUD.

ENVIRONMENTAL CONSEQUENCES



This viewpoint is on the east side of Berners Bay, just south of the confluence of the Berners, Lace, and Antler Rivers, in proximity to an existing Forest Service cabin. It is likely that cut-and-fill areas would be intermittently visible along the coastline from this viewpoint (for Alternatives 2, 2B, and 2C). A distinct line created by the removal of vegetation would also be noticeable. The project would have various levels of dominance within the landscape for marine viewers within Berners Bay, depending on the viewer's distance from the highway. From the distance represented by this simulation, however, the highway would likely be subordinate within the existing setting.

AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.

2) Visual Absorption Capability - very low to intermediate.

3) Variety Class - B

Visual Absorption Capability

Very High	Intermediate	Intermediate	Low	Very Low
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ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from moderate to very high levels.

Composite Impacts on Sensitive Viewers

Very High	High	Moderate	Low
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VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. However, for VQOs immediately adjacent to the TUS LUD the highway would deviate so greatly from form, line, color, and texture elements within the existing natural setting that it is not likely to be compatible with the adjacent adopted VQO.

Compatibility with TUS LUD VQO

Yes	Y/N*	No	N/A
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Compatibility with Adjacent VQO

Yes	N/Y*	No	N/A
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*N/A - App. as mitigation may bring the proposed project into compliance with VQO.

Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternatives 2, 2B, and 2C from Berners Bay South of Antler River Looking East

ELVP13

AFFECTED ENVIRONMENT



This viewpoint is four-tenths of a mile from the highway. The existing setting retains high scenic value for visitors within Berners Bay. Although the vegetative cover is relatively homogeneous and the topographic forms less visually interesting than other areas previously discussed, it is within the totality of the landscape elements that create a distinct and varied viewshed.

ENVIRONMENTAL CONSEQUENCES



This viewpoint occurs in the foreground viewing threshold of the proposed Sawmill Cove Ferry Terminal (for Alternatives 2A, 4B, and 4D). The highway would be intermittently noticeable along the eastern edge of Berners Bay, as discussed previously, related to ELVP13. However, the proposed ferry terminal would likely be highly visible from this distance and through the middleground viewing threshold. The contrasting forms, lines, colors, and textures of the ferry terminal would dominate the existing natural features within the viewshed.

AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.

2) Visual Absorption Capability - very low to very high.

3) Variety Class - B

Visual Absorption Capability

Very High	High	Intermediate	Very Low
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ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from moderate to very high levels.

Composite Impacts on Sensitive Viewers

Very High	High	Moderate	Low
-----------	------	----------	-----

VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. The highway would also be compatible with adopted adjacent VQOs.

Compatibility with TUS LUD VQO

Yes	No	N/A
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Compatibility with Adjacent VQO

Yes	No	N/A
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Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternatives 2A, 4B, and 4D from Berners Bay at Sawmill Cove Looking East

ELVP14

AFFECTED ENVIRONMENT



This viewpoint is 2.4 miles from the highway. The existing setting can be characterized as a background view of Berners Bay. Topographic features juxtaposed with the water's edge create visual interest in this panoramic view of the regional landscape.

ENVIRONMENTAL CONSEQUENCES



From this viewpoint, the highway is not likely to dominate substantially the existing natural setting. From closer distances, the proposed ferry terminal and associated roadway would be more noticeable. It is likely that visitors to Berners Bay, Echo Cove, and Point Bridgett State Park would notice the highway. However, this would be highly dependent on the viewing distance, and other visibility factors.

AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.

2) Visual Absorption Capability - very low to very high.

3) Variety Class - A/B

Visual Absorption Capability

Very High	High	Intermediate	Low	Very Low
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ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would range from moderate to very high levels.

Composite Impacts on Sensitive Viewers

Very High	High	Moderate	Low
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VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. The highway would also be compatible with adopted adjacent VQOs.

Compatibility with TUS LUD VQO

Yes	Y/N*	No	N/A
-----	------	----	-----

Compatibility with Adjacent VQO

Yes	N/Y*	No	N/A
-----	------	----	-----

*N/A - App as mitigation may bring the proposed project into compliance with VQOs.

Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternatives
2 2B, and 2C from
Point Bridget Looking East

ELVP15

AFFECTED ENVIRONMENT



The viewpoint is 1.1 miles from the highway, within the Chilkat Inlet, near Pyramid Rock. The viewshed is framed by Tukgahgo Mountain and Chilkat Peninsula (right) and Mount Emmerich Mountain (left) forcing a perspective into the river valley of the Chilkat River. The Alaska Chilkat Bald Eagle Preserve is located farther up the Chilkat River (out of sight within the photograph).

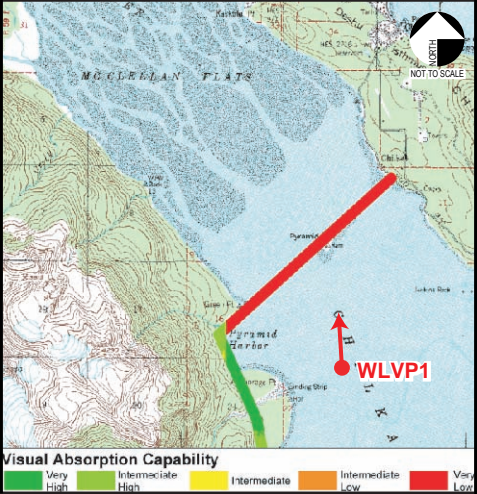
ENVIRONMENTAL CONSEQUENCES



From this viewpoint the long span bridge crossing the Chilkat Inlet would be a co-dominant feature within the natural/semi-modified setting. Unlike previous bridge crossing discussed which are less noticeable in the middleground and background viewing thresholds (e.g., Katzehin and Berners Bay), this proposed crossing is of such great scale and magnitude that even in the background threshold it may be noticeable, with visibility increasing substantially as distance decreases. It is likely that within the foreground threshold, this bridge would become a dominant feature within the natural setting.

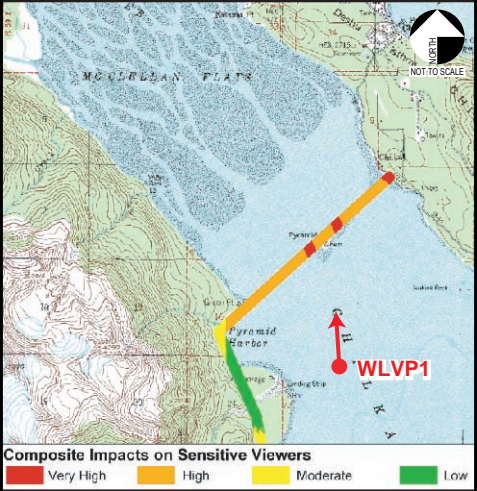
AFFECTED ENVIRONMENT

- 11) Views most susceptible to impact include those seen by residents of Haines, tourists, and visitors within recreation areas.
- 2) Visual Absorption Capability - very low.
- 3) Variety Class - A/B



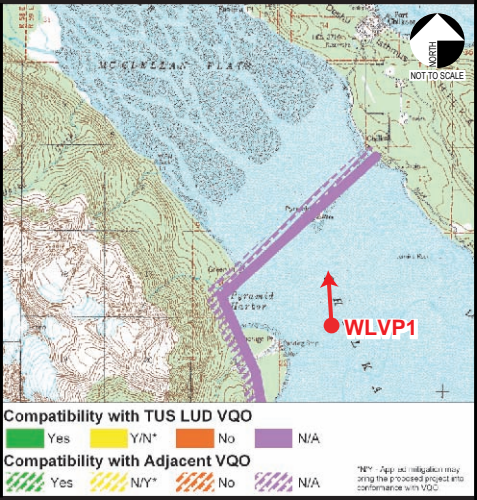
ENVIRONMENTAL CONSEQUENCES


Impacts associated with this portion of the highway would range from high to very high levels.



VISUAL QUALITY OBJECTIVES

The highway does not affect Forest System Lands; therefore VQOs are not applicable.





Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternative 3
from Chilkat Inlet South of Pyramid
Island Looking North

WLVP1

AFFECTED ENVIRONMENT



This viewpoint is 1.1 miles from the highway. It offers dramatic views of the Chilkat Range. Davidson Glacier (just north of Sullivan Mountain), scoured-rock mountain cliffs, and variations in vegetation color add distinctive visual interest when juxtaposed with the Davidson Glacier Delta.

ENVIRONMENTAL CONSEQUENCES



The highway would traverse the headwater delta of the Davidson Glacier. The topography is very flat along this portion of the highway. It is likely that the highway would be a subordinate feature within the existing natural setting because existing vegetation would provide screening to the limited, if any, visible cuts, reducing the overall visibility of the project.

AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by residents of Haines, tourists, and visitors within recreation areas.

2) Visual Absorption Capability - very high.

3) Variety Class - A

Visual Absorption Capability

Very High High Intermediate Low Very Low

ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would likely be low.

Composite Impacts on Sensitive Viewers

Very High High Moderate Low

VISUAL QUALITY OBJECTIVES

The highway does not affect Forest System Lands; therefore VQOs are not applicable.

Compatibility with TUS LUD VQO

Yes Y/N* No N/A

Compatibility with Adjacent VQO

Yes Y/N* No N/A

Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternative 3
from Lynn Canal at Davidson Glacier
Looking West

WLVP2

AFFECTED ENVIRONMENT



The viewpoint is eight-tenths of a mile from the highway. The existing setting contains dramatic views of the Endicott River headwaters. The Endicott River Wilderness is located farther upstream. Exposed rock-outcroppings along the shore add visual interest by contrasting sharply with the delta flatlands of the Endicott River. Color variances associated with vegetative cover and rounded mountainous forms (as compared to the more jagged forms along the East Lynn Canal Alternative contribute further to the interesting overall layering of landscapes.

ENVIRONMENTAL CONSEQUENCES



From this viewpoint it is likely that the proposed highway would be intermittently noticeable from within the foreground and middleground viewing thresholds, yet subordinate to the existing natural setting. The proposed bridge to cross the Endicott River may become a dominant feature from this viewpoint.

AFFECTED ENVIRONMENT

1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.

2) Visual Absorption Capability - intermediate high to very high.


3) Variety Class - A

ENVIRONMENTAL CONSEQUENCES

Impacts associated with this portion of the highway would likely be moderate.

VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. The highway would also be compatible with adopted adjacent VQOs.



Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternative 3
from Lynn Canal at Endicott River Delta Looking West

WLVP3

AFFECTED ENVIRONMENT



This viewpoint is one-half mile from the highway. The existing setting contains textural changes associated with both vegetation and rock forms that are more obvious than other areas previously discussed (partly a factor of distance). Species of tall, dark green trees contrast sharply with the low-lying, light green shrub species. Rock forms on both mountainsides and at the water's edge balance the setting. Distant background views within the Endicott River Wilderness are slightly noticeable on the right of the above photograph.

ENVIRONMENTAL CONSEQUENCES



From this viewpoint, viewers of the landscape would likely notice an intermittent linear band around the toe of William Henry Mountain. Unlike the East Lynn Canal Alternative, the alignment of this portion of the highway would have reduced visibility of the linear band because the highway would be sited on a gentler topographic bench. This view demonstrates the effectiveness of vegetative screening. The existing rock outcrops would also allow the highway to be a more co-dominant to subordinate feature within the existing setting.

AFFECTED ENVIRONMENT


1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.

2) Visual Absorption Capability - intermediate high to very high.

3) Variety Class - A/B

Impacts associated with this portion of the highway would likely be moderate.

The highway within the TUS LUD is compatible with the adopted Modification VQO. The highway would also be compatible with adopted adjacent VQOs.



Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternative 3
from Lynn Canal at William Henry Mountain
Looking West

WLVP4

AFFECTED ENVIRONMENT



The viewpoint is three-tenths of a mile from the highway.

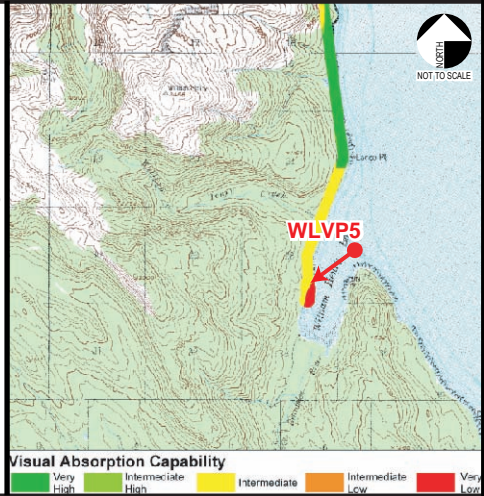
ENVIRONMENTAL CONSEQUENCES



From this viewpoint, middleground and background views of the highway, including the ferry terminal, would be limited (for marine travelers). Views would be mainly foreground views. The highway itself would be visible intermittently as it traverses east and north around the outer edge of the bay; it is likely to have a co-dominant relationship with the existing natural setting. However, the proposed ferry terminal is likely to dominate the viewshed, as the high degree of contrasting forms, lines, colors, and textures associated with it would occur.

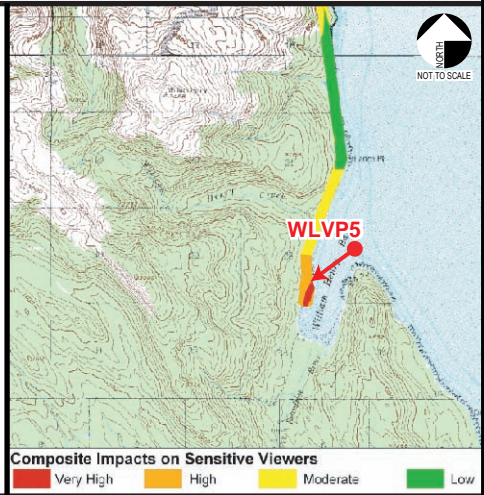
AFFECTED ENVIRONMENT

- 1) Views most susceptible to impact include those seen by tourists and visitors within recreation areas.
- 2) Visual Absorption Capability - intermediate to very low.
- 3) Variety Class - A/B



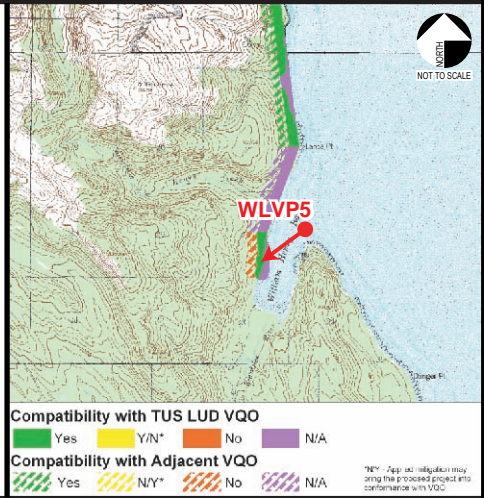
ENVIRONMENTAL CONSEQUENCES


Impacts associated with this portion of the proposed project would likely range from high to very high.



VISUAL QUALITY OBJECTIVES

The highway within the TUS LUD is compatible with the adopted Modification VQO. However, for VQOs immediately adjacent to the TUS LUD the highway would deviate so greatly from form, line, color, and texture elements within the existing natural setting that it is not likely to be compatible with the adjacent adopted VQO.





Alaska Department of Transportation

Juneau Access Improvements Project

Visual Simulation of Alternative 3

William Henry Bay Ferry Terminal from

William Henry Bay Looking West

WLVP5

