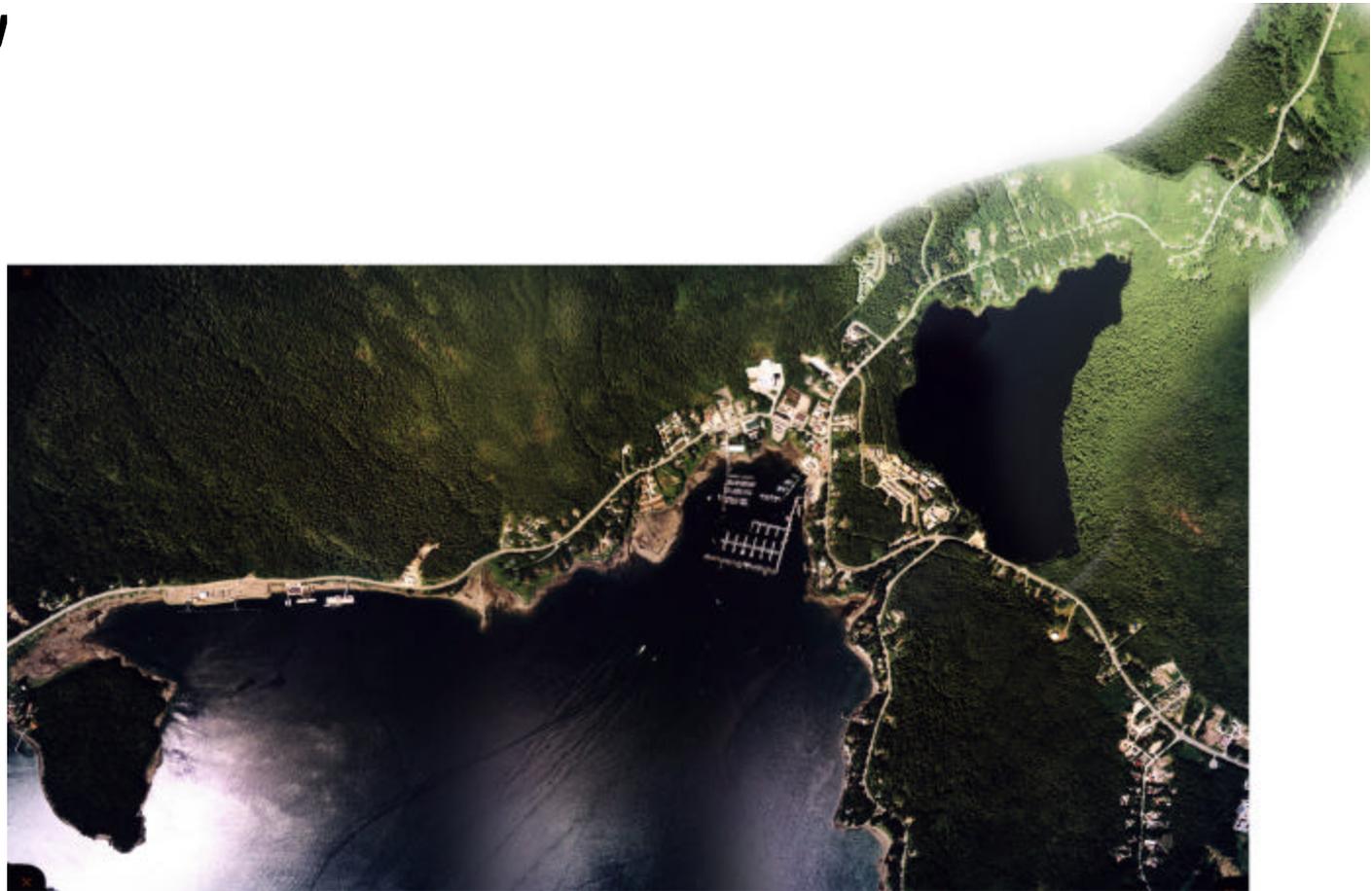


Auke Bay



Corridor Study

Welcome to the 2nd Citizens' Advisory Committee Meeting



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Corridor Study

Auke Bay Corridor Study

An Interim Report on Traffic
Issues to the Citizens Advisory
Committee

DOT&PF Southeast Region

Prepared by USKH / Kinney Engineering

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Corridor Study

Accident Study

- Work to date
 - Collected accidents for 5 most recent years
 - Past speed studies
 - Analysis/additional studies
 - Discussion paper
- 67 Accidents in the study area between 1996 and 2000

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Corridor Study

Speeds

Segment	Posted	Average of Mean Speeds	Average of 85th Percentile Speeds
BOP to NOAA Labs	45 MPH	45 MPH	49 MPH
NOAA to Waydelich Creek	35 MPH	37 MPH	42 MPH
Waydelich to Ferry Terminal	45 MPH	51 MPH	56 MPH
Ferry Terminal to EOP	50 MPH	51 MPH	56 MPH

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Corridor Study

Methods

- Accident studies:
 - Look for abnormal collision patterns
 - Seek causes or contributing factors
 - Propose countermeasures

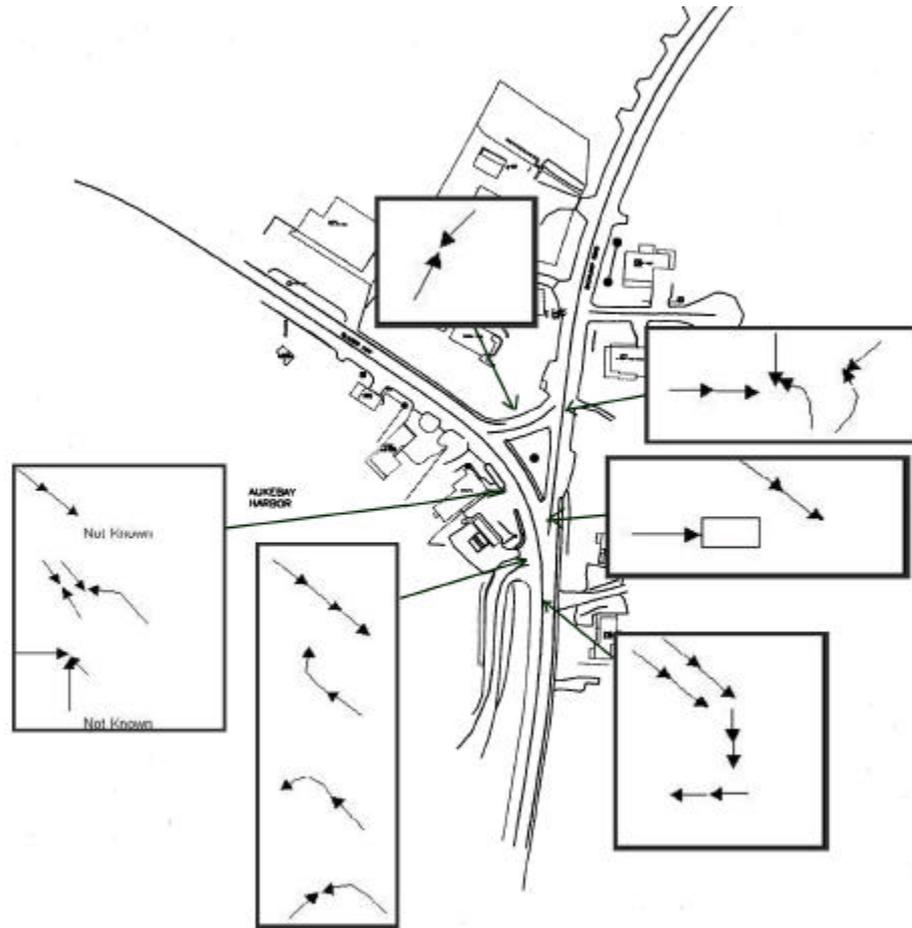


Accidents at Intersections

Intersection	Guardrail	Head On	Head On Sideswipe	Left Turn	Overtaking Sideswipe	Parked	Rear End	Right Angle	U turn	Int. Total	Accident Rate (Acc/MEV)	Rate >UCL and Significant?	Accident Type(s) Needing Attention?
Ferry Terminal Access and Glacier Highway	1						4	2		7	0.95	No	
Mendenhall Loop Wye, Mendenhall Loop Rd, Harbor, and Glacier Hwy		1	1	2		1	10	3		18	1.19	Yes	Rear-Ends are statistically significant
Fritz Cove, UAS South Access, Glacier Hwy	1		1		1		2	3	1	9	0.44	No	
Mendenhall Loop Rd and UAS North Access							1			1	0.24	No	
Accident Type Totals	2	1	1	2	1	1	17	9	1				



Wye Collision Diagram Cluster Analysis



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Corridor Study

High Rate, Significant Rear Ends Contributing Factors at the Wye

Contributing Factors:

- Sight distance on curve, inbound can't see because of development
- Speed on curve
 - >40 mph actual
 - designed for 30 mph
- Intersection configuration: skewed with overlapping conflicts
- No turn lanes



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Corridor Study

Highway Segments

Segment	Ditch	Embankment	Guardrail	Head On	Other	Overturn	Parked	Pedestrian	Rear End	Right Angle	Tree	Segment Total	Accident Rate (Acc/MVM)	Rate >UCL and Significant?	Accident Type(s) Needing Attention?
Glacier Hwy, Ferry to Auk Nu Dr.	4	2		1		2			1			10	2.45	Yes	9 Single Vehicle Loss of Control, 1 Head On.
Glacier Hwy, Auk Nu Dr. to Harbor			2		1	1			2	1		7	0.87	No	
Glacier Hwy, Harbor to Fritz Cove Road			2			1	1		3			7	0.85	No	
Mendenhall Loop Rd, University Drive to UAS North Access	2						2	2		1	1	8	7.98	Yes	2 Pedestrian, 5 Single Vehicle Loss of Control.
Mendenhall Loop Rd, UAS North Access to Glacier Hwy															
Accident Type Totals	6	2	4	1	1	4	3	2	6	2	1				

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Corridor Study

- 10 accidents (loss of control) and 4 injuries, significant
- Speeds are posted 45 mph but travel speeds >55 mph
- Some curves along the section are designed for 40 mph to 50 mph →
- 9 of the 10 accidents on snow and ice surfaces
- Interim drainage measures for sharp curve near Auke Nu.



Other Solution?:
Realignment to Match
Speed.

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Corridor Study

Mendenhall Loop, University to UAS Access

- 8 accidents, intersection has a high accident rate
- Most of the accidents occurred under poor road surface conditions (7 of 8)
- Most at night (5 of 8)
- There were more severe accidents here on a percentage basis than found in the statewide population (1 fatal, 1 major injury, 3 minor injuries)

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Corridor Study

- High pedestrian activity, provide pathways and better crossings?
- Crest of vertical alignment may restrict sight lines?
- Warrant illumination?

Mendenhall Loop, University to UAS Access



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Corridor Study

Conflict Study

- Conflict studies are used to verify collision potential at location where accident history isn't conclusive
- In response to CAC Meeting #1, we did a study of the Fritz Cove / UAS Access Intersection
- Counted conflicts over 2 days, 2 hours in morning, 2 hours in evening on both days

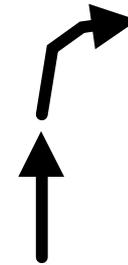
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Corridor Study

- Lots of right-turn conflicts caused by traffic slowing and turning into UAS. (20/hour in AM, 40/hour in PM)
- Sight distance restricted didn't seem to cause many conflicts →

Fritz Cove Conflicts

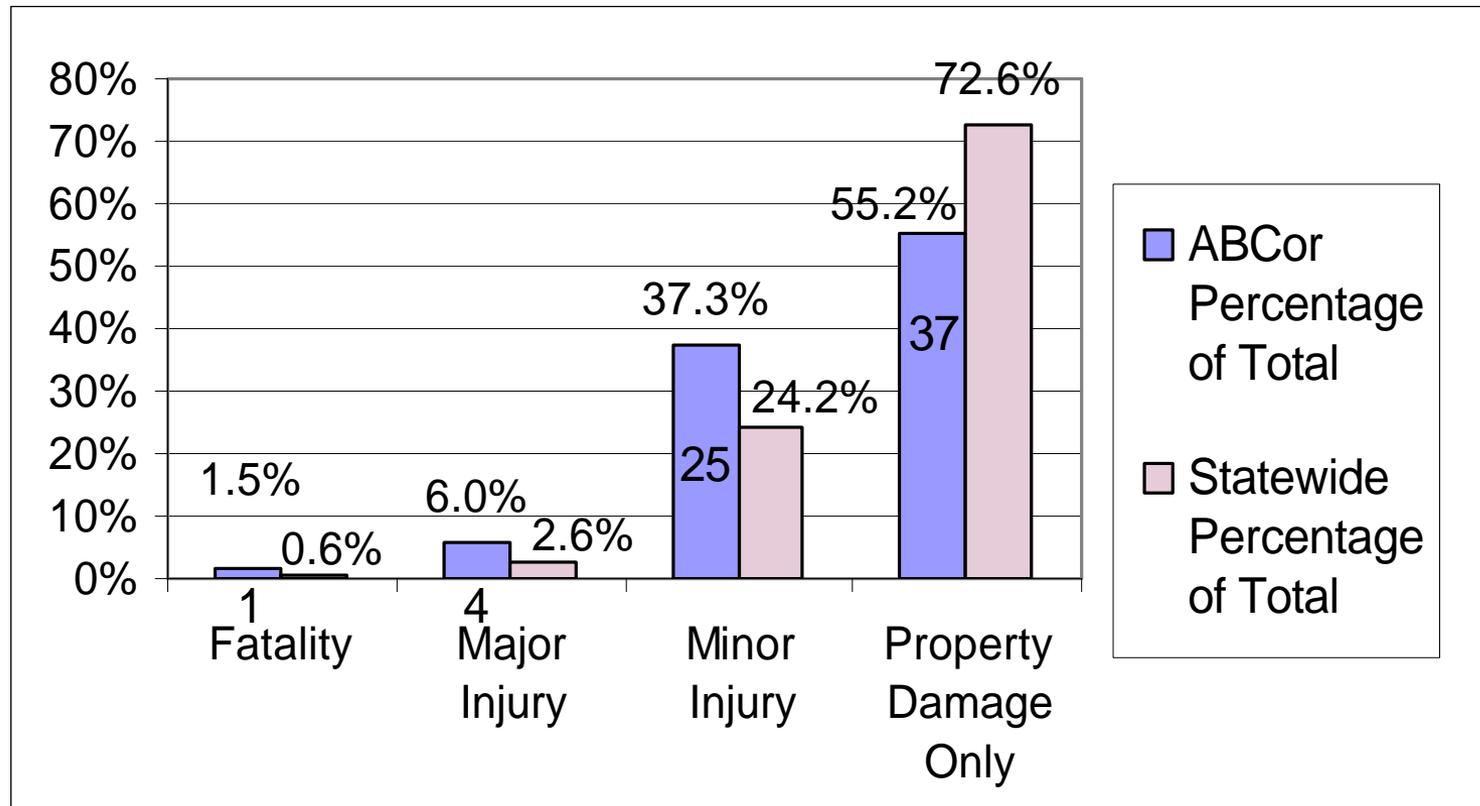


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Corridor Study

As a result of speed, the severity of accidents on ABCor are higher than average



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Corridor Study

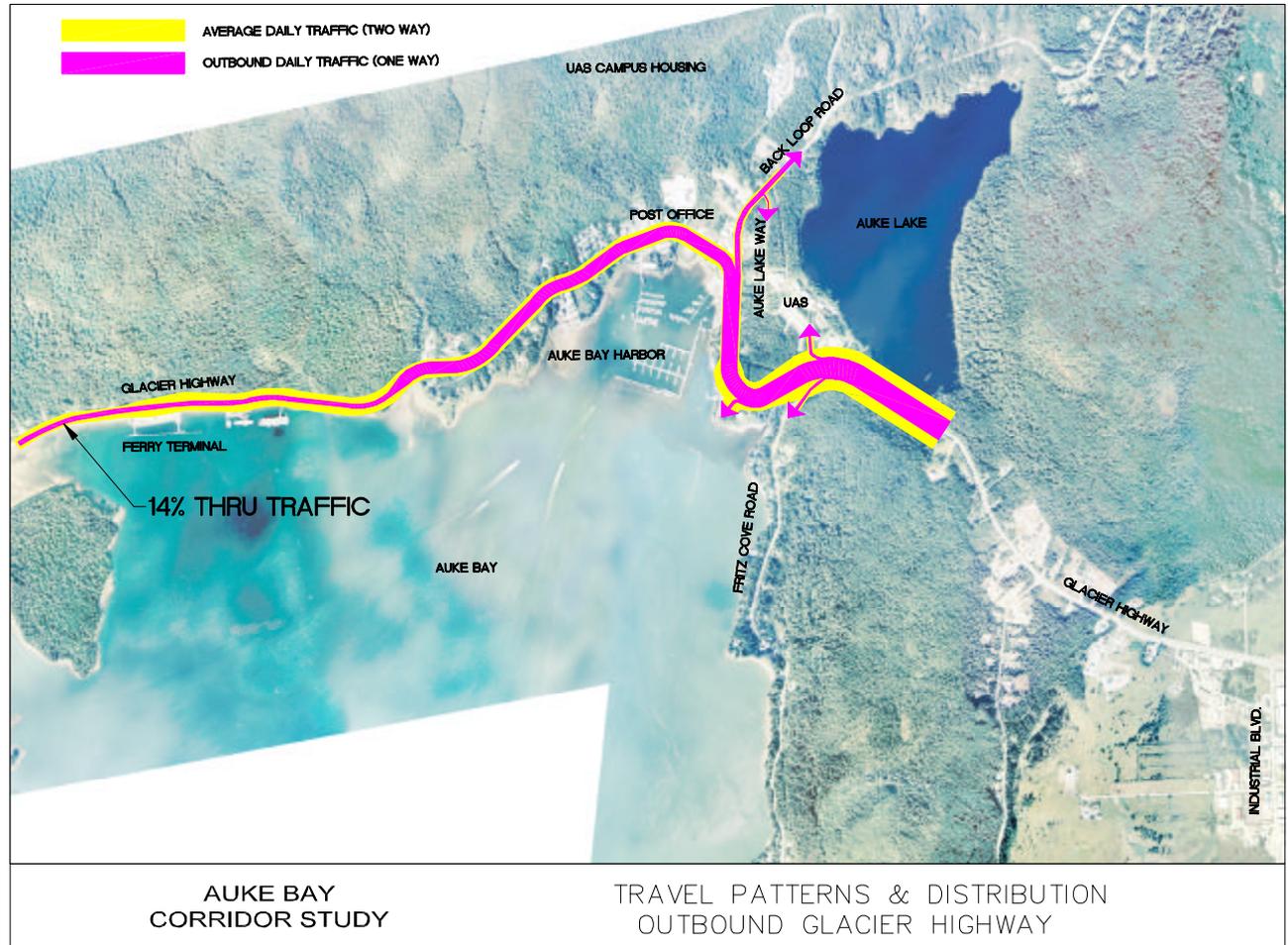
Origin-Destination Study

- Looked at travel patterns for morning and evening traffic
- Useful in determining where traffic would go if other routes were provided
- Also very useful in determining future traffic volumes

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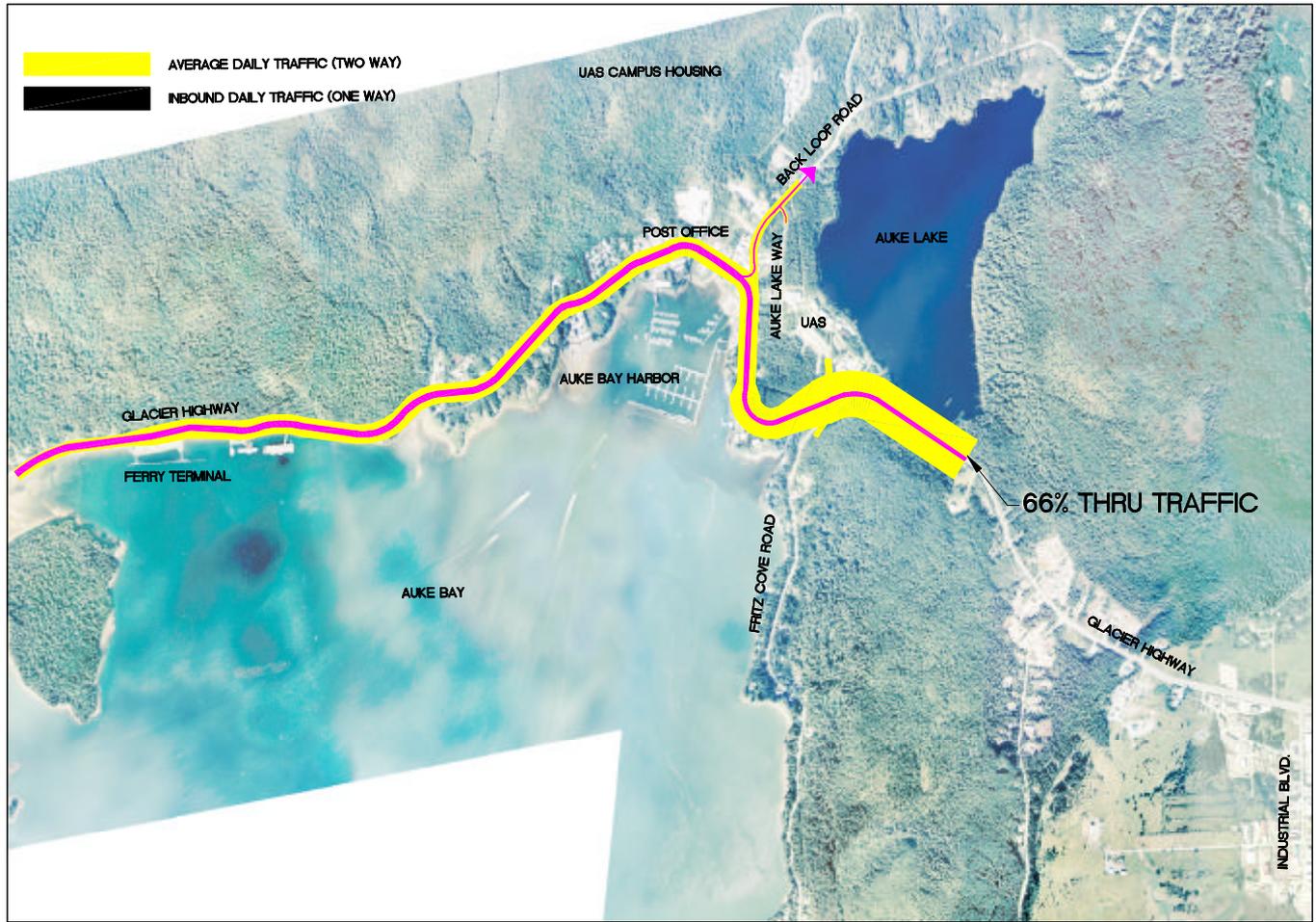
Corridor Study



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Corridor Study



AUKE BAY
CORRIDOR STUDY

TRAVEL PATTERNS & DISTRIBUTION
INBOUND GLACIER HIGHWAY

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Corridor Study

Geometric Analysis

- We evaluated the following geometric elements for compliance with current design standards:
 - Highway curvature
 - Highway grades
 - Cross section (lane/shoulder/sidewalk width)
 - Intersection sight distance
- We used the following design speeds for analysis:
 - 40 MPH - Fritz Cove Road to Waydelich Creek
 - 50 MPH – Waydelich Creek to the ferry terminal

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Corridor Study

Geometric Analysis

- Three horizontal curves do not meet standards:
 - Near Auke Bay Lab (33 MPH vs. 40 MPH)
 - Near Post Office (35 MPH vs. 40 MPH)
 - Near Waydelich Creek (35 MPH vs. 40 MPH)
- Grades meet standards.

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Corridor Study

Geometric Analysis

- Cross sections meet minimum standards, with the exception of some accessibility issues.
- Bicycle and pedestrian standards are open to more interpretation, but additional features are likely warranted.



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Corridor Study

Geometric Analysis

- Intersection sight distance meets minimum standards throughout the corridor.
- Several intersections have less than desirable sight distance:
 - Fritz Cove Road
 - Harbor Access Road
 - DeHart's Driveway

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Corridor Study

Geometric Analysis

- Several locations within the corridor experience limited sight distance due to temporary obstructions (i.e., parked vehicles):
 - DeHart's Driveway
 - Caroline Street



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Corridor Study

Traffic Volume Forecasts

- We've developed 2009, 2019, and 2029 Average Annual Daily Traffic (AADT) for four segments within the project corridor
- AADT can be further refined into hourly volumes and intersection turn movements
- Use volumes to select applicable design standards and criteria

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Corridor Study

Forecast Methods

- Develop models that:
 - Look at past traffic growth and project that trend into the future
 - Forecasts using the relationships between traffic and demographics and economic trends
 - Forecasts based on land use changes and development
- Our model combines all three approaches. We also added or adjusted traffic for some extraordinary events outside of the model. (e.g. the Road to Skagway, Lena Pt. Development, etc.)

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Corridor Study

Past Traffic

Year	→ Between →	Auke Bay Ferry Terminal	Auke Nu Drive	Harbor Drive/ Auke Bay Float Road	Fritz Cove Road
		Auke Nu Drive	Harbor Drive/ Auke Bay Float Road	Fritz Cove Road	Engineers Cut-Off Road
1994		3,900	5,200	8,000	10,000
1995		4,010	5,390	8,320	10,200
1996		4,010	5,360	8,420	10,240
1997		4,014	5,485	9,096	11,640
1998		4,126	5,590	7,804	11,853
1999		3,986	5,460	7,684	11,743
2000		4,097	5,612	7,863	11,743
2001		4,117	5,668	7,977	12,013

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Corridor Study

Crossroads

Year	Fritz Cove Road Approach To Glacier Highway	College Road- UAS South Entrance	College Road- UAS North Entrance	Mendenhall Loop Road- Glacier Highway To UAS Entrance	Mendenhall Loop Road, East Of UAS Entrance	Harbor Drive/ Auke Bay Float Road
1994	1,300	1,700	700	no data	1,700	1,400
1995	1,320	1,220	540	no data	1,510	2,540
1996	1,320	790	540	1,650	1,790	850
1997	1,316	1,728	543	2,121	1,955	850
1998	1,316	1,728	661	2,121	1,955	850
1999	1,316	1,728	661	2,121	1,915	850
2000	1,352	1,525	661	2,121	2,048	850
2001	1,352	1,525	661	2,121	2,352	850

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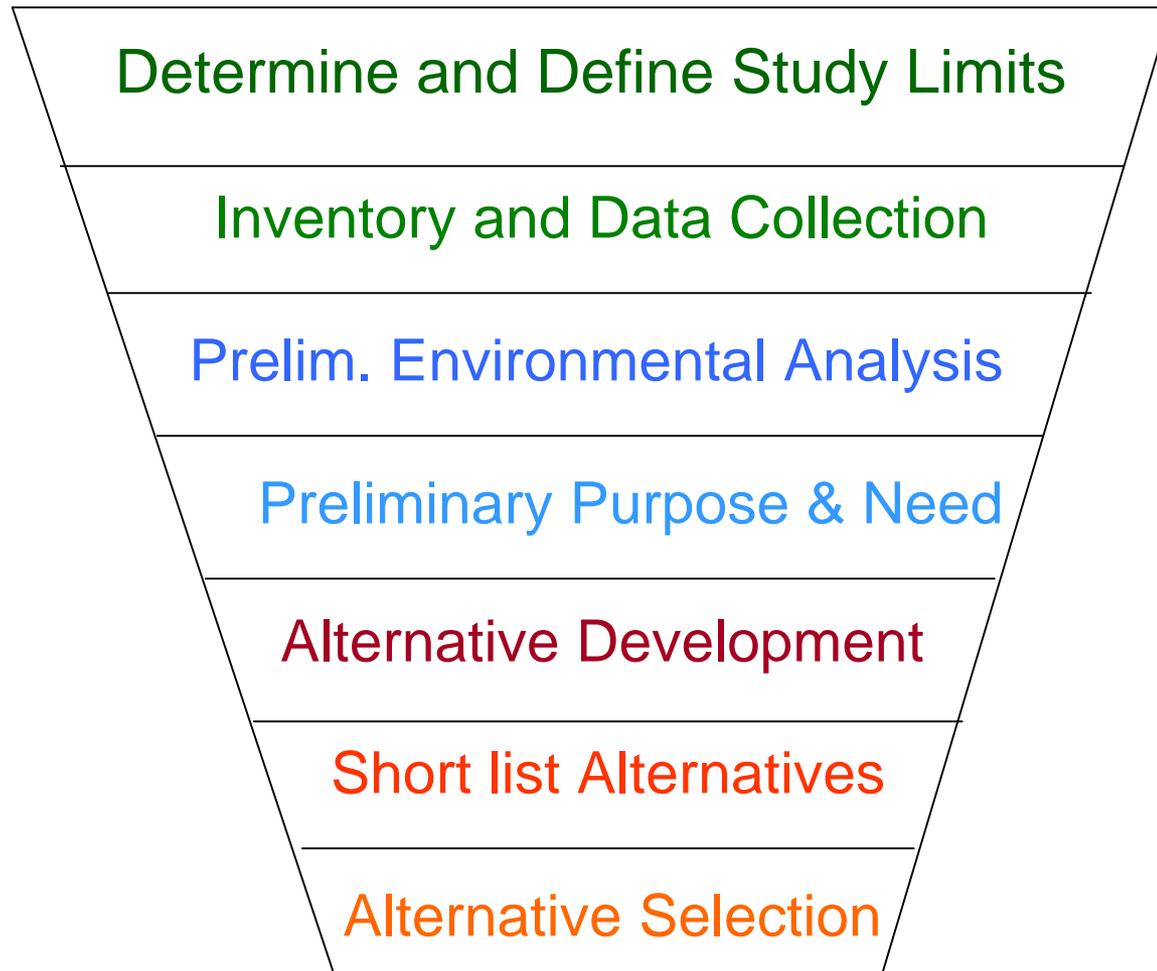
Corridor Study

Traffic Forecasts

Year	ADT Element	→ Between →	Auke Bay Ferry Terminal	Auke Nu Drive	Harbor Drive/ Auke Bay Float Road	Fritz Cove Road
			Auke Nu Drive	Harbor Drive/ Auke Bay Float Road	Fritz Cove Road	Engineers Cut-Off Road
2009	Base		4,300	4,400	8,900	13,400
	Juneau Access		700	700	700	700
	Ferry		350	350	350	350
	Development		370	370	60	100
	UAS		100	100	500	500
	2009 AADT		5,820	5,920	10,510	15,050
2019	Base		4,400	4,900	10,100	15,300
	Juneau Access		850	850	850	850
	Ferry		350	350	350	350
	Development		480	480	310	590
	UAS		100	100	800	800
	2019 AADT		6,180	6,680	12,410	17,890
2029	Base		4,800	6,100	13,000	19,800
	Juneau Access		1,000	1,000	1,000	1,000
	Ferry		350	350	350	350
	Development		590	590	560	1,060
	UAS		100	100	800	800
	2029 AADT		6,840	8,140	15,710	23,010



Where do we go from here?



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Corridor Study

Welcome to the 4th CAC Meeting



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Corridor Study

At the 1st CAC Meeting:

- We explained the role the CAC members were going to play in the project development process.
- We talked about the history of the project.
- We asked what you would like this project to accomplish.
- We asked for help in defining goals and objectives this project should strive to meet.

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Corridor Study

At the 2nd CAC Meeting:

- We asked for your input to help us prioritize the project goals and objectives to further define what is important for this project to accomplish.
- We presented our findings about collisions, geometry, origin-destination study, traffic forecasts, etc. We defined the existing problems in the project area and those we expect in the future.

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Corridor Study

At the 3rd CAC Meeting:

- We presented a draft purpose and need statement. This statement incorporated the objectives we developed and the problems we defined. It is a concise statement by which we will judge improvement concepts.
- We presented design concepts and ideas that could be implemented into a preferred alternative. These included streetscape options, intersection treatments, bypasses, and realignments of Glacier Highway.

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Corridor Study

Purpose

- The purpose of the Auke Bay Corridor project is:
 - To improve surface transportation along the Glacier Highway corridor between Fritz Cove Road and the Auke Bay Ferry Terminal.
 - The improvement should provide sufficient capacity to safely handle the traffic demands for a 20-year design life.

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Corridor Study

Need

- Improve the safety of identified intersections and segments.
- Improve the substandard geometric design deficiencies along the road.
- Provide for movement throughout the corridor that is more reliable, efficient, convenient, and cost effective.
- Enhance non-motorized access on, off and across the corridor.

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Corridor Study

Tonight's Meeting Purpose:

- To assist DOT&PF in forwarding three alternatives for further refinement.
- We are asking the CAC to provide DOT&PF with their honest and direct opinions about the alternatives.

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Corridor Study

Tonight's Meeting:

- We will ask you for your opinion based on the Gradient of Agreement scale. We use this scale because Yes and No can mean different things to different people.
- Yes could mean:
 - “This is the best idea I have ever considered.”
 - “I will go along with your idea but I am not thrilled.”
- No could mean:
 - “I do not understand this idea - to be safe I vote ‘No’.”
 - “This idea stinks, it offends me completely and I cannot stand it.”

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Corridor Study

Meeting Format:

- We will randomly ask each CAC member to state their grade and why.
- Explain your opinions about how well each alternative meets the purpose and need (We provided a summary for your reference).
- Every member will have their opportunity to voice their opinions.
- The purpose of this exercise is to help DOT&PF decide which alternatives to forward for more study. It is not to convince or persuade other CAC members of the best concept.

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Corridor Study

Presentation of Concepts

- We developed concepts to address project problem areas and meet the preliminary purpose and need.
- We identified sixteen discrete segments - either new alignments, proposed improvements to the existing alignment, or intersection configurations.
- We solicited additional ideas from project participants and the public.
- Using this wide range of ideas, we combined the discrete segments into seven concept alternatives to address the entire project corridor.
- We considered construction alternatives and Traffic Demand Management (TDM).

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Corridor Study

Concept 1

Estimated Cost \$72 million

- Signals will be added to Back Loop Road and Fritz Cove Road intersections and geometric deficiencies would remain.
- The Auke Nu Drive to ferry terminal segment would remain unchanged.
- Access from Back Loop Road to UAS would be improved.
- The substandard horizontal curves at the NMFS lab, Auke Bay post office, and Stabler's Point on Glacier Highway would remain unchanged.
- Sight distance conditions at the Fritz Cove Road and Back Loop Road intersections would remain the same.
- Pedestrian and bicycle facilities along Glacier Highway will be upgraded with shoulders and a pathway on the beach side of Glacier Highway from Waydelich Creek to the ferry terminal.
- Access would be provided to undeveloped CBJ property on the east side of Auke Lake and above Auke Bay.

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Corridor Study

Concept 2

Estimated Cost \$201 million

- Geometric deficiencies at Fritz Cove Road intersection would remain the same but would be upgraded with a signal.
- The Back Loop Road intersection could be reconfigured in conjunction with the new intersection and overpass.
- The Auke Nu Drive to ferry terminal segment would remain unchanged.
- Back Loop Road between University Drive and UAS entrance would be improved.
- The substandard horizontal curves at the NMFS lab, Auke Bay post office, and Stabler's Point on Glacier Highway would remain unchanged.
- Sight distance conditions at the Fritz Cove Road intersection with Glacier Highway would remain the same.
- Pedestrian and bicycle facilities along Glacier Highway will be upgraded with shoulders and includes a pathway on the beach side of Glacier Highway from Waydelich Creek to the ferry terminal.
- Access would be provided to undeveloped CBJ property above Auke Bay.

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Corridor Study

Concept 3

Estimated Cost \$126 million

- Geometric deficiencies at the at Back Loop Road intersection would be corrected
- Geometric deficiencies associated with the existing intersections Fritz Cove Road would remain but improved with a signal.
- The Auke Nu Drive to ferry terminal segment would be improved.
- Back Loop Road between University Drive and UAS entrance would remain unchanged, except for new sidewalks.
- The horizontal curve at the NMFS lab would remain unchanged.
- The horizontal curves at Auke Bay post office and Stabler's Point on Glacier Highway would be brought up to standards.
- Sidewalks would be added from Fritz Cove Road to Waydelich Creek and a pathway on the beach side from Waydelich Creek to the ferry terminal.

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Corridor Study

Concept 4

Estimated Cost \$14 million

- Geometric deficiencies at the existing intersections at Back Loop Road would be corrected
- Geometric deficiencies associated with the existing intersections Fritz Cove Road would be improved and a signal would be installed.
- The Auke Nu Drive to ferry terminal segment would be improved.
- Back Loop Road between University Drive and UAS entrance would remain unchanged.
- The horizontal curves at the NMFS lab, Auke Bay post office, and Stabler's Point on Glacier Highway would be brought up to standards.
- Sight distance at Fritz Cove Road and DeHart's would be improved.
- Sidewalks would be added to both sides from Fritz Cove to Waydelich and a pathway on the beach side from Waydelich to the ferry terminal.

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Corridor Study

Concept 5

Estimated Cost \$30 million

- Geometric deficiencies at the existing intersections at Back Loop Road would be corrected
- A new intersection with Fritz Cove Road would be constructed south of the existing intersection.
- The Auke Nu Drive to ferry terminal segment would be improved.
- Back Loop Road between University Drive and UAS entrance would remain unchanged.
- The horizontal curves at the NMFS lab, Auke Bay post office, and Stabler's Point on Glacier Highway would be brought up to standards.
- Sight distance conditions at Fritz Cove Road and DeHart's would be corrected.
- Sidewalks would be added to both sides from Fritz Cove to Waydelich and a pathway on the beach side from Waydelich to the ferry terminal.

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Corridor Study

Concept 6

Estimated Cost \$63 million

- A roundabout would be built at Back Loop Road.
- A new signalized intersection with Fritz Cove Road would be constructed south of the existing intersection.
- Back Loop Road to the UAS entrance would remain unchanged.
- The horizontal curves at the NMFS lab would be brought up to standards.
- Sight distance issues at Fritz Cove Road and DeHart's would be corrected.
- Auke Nu Drive to ferry terminal segment would remain unchanged.
- The horizontal curve at the NMFS lab would be brought up to standards.
- The horizontal curves at the Auke Bay post office and Stabler's Point on Glacier Highway would remain unchanged.
- Sidewalks would be added to both sides of Glacier Highway from Fritz Cove to Waydelich Creek, a pathway on the beach side from Waydelich Creek to the ferry terminal, and shoulders on the new bypass route.
- Access would be provided to undeveloped CBJ property above Auke Bay.

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Corridor Study

Concept 7

Estimated Cost \$43 million

- Geometric deficiencies at Back Loop Road would be corrected.
- Geometric deficiencies at Fritz Cove Road would remain, but the intersection would be signalized.
- Deficiencies associated with the Fritz Cove Road to ferry terminal segment would remain.
- Back Loop Road between Goat Hill Road and UAS entrance would remain the same.
- The horizontal curves at the NMFS lab, Auke Bay post office, and Stabler's Point on Glacier Highway would remain unchanged.
- Sight distance conditions at Fritz Cove Road would remain unchanged.
- Shoulders would be added for pedestrians to walk on the new bypass route around Auke Lake and behind Auke Bay. Sidewalks would be added to both sides from Fritz Cove Road to Waydelich Creek and a pathway on the beach side from Waydelich Creek to the ferry terminal.
- Access would be provided to undeveloped CBJ property on the east side of Auke Lake.

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Corridor Study

What is Next?

- PSC Meeting Friday, May 16, 2003
- Next CAC Meeting
- Thursday, August 14, 2003
- Purpose of Next CAC Meeting
- Next Public Meeting
- Tuesday, September 16, 2003
- Purpose of Public Meeting

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Corridor Study

Agenda

- Presentation of Tonight's Agenda
- Summary of Work Since Our Last Meeting
- Presentation of Alternatives
- Reframing Discussion
- Polling Exercise
- What Is Next?
- Public Testimony
- Adjourn



Goals and Objectives

Goals

<p>To create a safe corridor</p>	<p>To balance accessibility and mobility</p>	<p>To develop a project that is compatible with the human and natural environment</p>	<p>To develop a project that is feasible</p>
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Objectives

<p>Meet current design standards for vehicles, bicycles, and pedestrians</p>	<p>Improve travel efficiency for local and through traffic</p>	<p>Minimize impacts to the natural environment</p>	<p>Develop a project that is financially feasible</p>
<p>Reduce the number and severity of accidents</p>	<p>Increase pedestrian and bicycle connectivity and mobility</p>	<p>Minimize social and economic impacts</p>	<p>Develop a project that has community acceptance</p>
<p>Accommodate future traffic volumes</p>	<p>Maintain or improve access for emergency response</p>	<p>Actively involve the public</p>	
<p>Investigate and address roadside boat trailer parking</p>	<p>Maintain or improve access for elementary school and UAS</p>	<p>Be consistent with existing and future land use plans</p>	
<p>Accommodate mixed-use activities (education, tourism, recreation)</p>	<p>Enhance the community of Auke Bay</p>		

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Corridor Study

Purpose

The purpose of the Auke Bay Corridor project is to improve surface transportation along the Glacier Highway corridor, between Fritz Cove Road and the Auke Bay Ferry Terminal. The improvement should provide sufficient capacity to safely handle the traffic demands for a 20-year design life.

Purpose and Need

Need for the Action

- Improve the safety of identified intersections and segments.
- Improve the substandard geometric design deficiencies along the existing road alignment.
- Provide more reliable, efficient, convenient, and cost effective movement throughout the corridor.
- Enhance non-motorized access on, off and across the corridor.

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Corridor Study

Alternative 1

Typical Cross Section

- Fritz Cove Road to Waydelich Creek
 - 3-lane section with sidewalks on both sides
 - 14-ft outside lanes to be shared with bikes
 - 12-ft center two-way left turn lane
- Wadelich Creek to Ferry Terminal
 - Two 12-ft lanes with 8-ft shoulders
 - Separated 10-ft pathway on water side

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Corridor Study

Alternative 1

- Intersection Control
 - Roundabout at Glacier Highway and Fritz Cove Road/South UAS Access
 - Roundabout at Glacier Highway and Mendenhall Loop Road
- Geometric Improvements (Curve Corrections)
 - Auke Bay Lab
 - DeHart's
 - Post Office
 - Stablers Point

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Corridor Study

Alternative 1

Preliminary Project Costs

Design	\$	950,000
Right of Way		[pending]
Utilities		[pending]
Construction		9,470,000
Construction Engineering		1,420,000
TOTAL	>\$	11,840,000

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Corridor Study

Alternative 2

Typical Cross Section

- Fritz Cove Road to Mendenhall Loop Road
 - 3-lane section with sidewalks on both sides
 - 14-ft outside lanes to be shared with bikes
 - 12-ft center two-way left turn lane
- Mendenhall Loop Road to North UAS
Access/Bypass
 - Two 14-ft lanes to be shared with bikes
 - Sidewalks on both sides

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Alternative 2

Typical Cross Section (Cont.)

- Bypass Alignment (North UAS Access to Glacier Highway)
 - Two 12-ft lanes with 8-ft shoulders
- Glacier Highway (Bypass Connection to Ferry Terminal)
 - Two 12-ft lanes with 8-ft shoulders
 - Separated 10-ft pathway on water side

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Alternative 2

- Intersection Control
 - Roundabout at Glacier Highway and Fritz Cove Road/South UAS Access
 - Signal at Glacier Highway and Mendenhall Loop Road
 - Roundabout at Mendenhall Loop Road and North UAS Access/Bypass
 - Stop control on Glacier Highway at Bypass Connection
- Geometric Improvements (Curve Corrections)
 - Auke Bay Lab
 - Stablers Point

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Corridor Study

Alternative 2

Preliminary Project Costs

Design	\$ 1,140,000
Right of Way	[pending]
Utilities	[pending]
Construction	11,440,000
Construction Engineering	1,720,000
TOTAL	>\$ 14,300,000

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Alternative 3

Typical Cross Section

- Bypass Alignment (inc. Wildmeadow Lane)
 - Two 12-ft lanes with 8-ft shoulders
- Glacier Highway (Bypass Connection to Ferry Terminal)
 - Two 12-ft lanes with 8-ft shoulders
 - Separated 10-ft pathway on water side

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Alternative 3

Intersection Control

- Signal at Glacier Highway and Industrial Boulevard/Wildmeadow Lane
- Signal at Bypass and Mendenhall Loop Road (Goat Hill)
- Stop control on UAS Connector at Bypass Connection
- Stop control on Glacier Highway at Bypass Connection

- Stop control on Fritz Cove Road/South UAS Access at Glacier Highway
- Stop control on Mendenhall Loop Road at Glacier Highway
- Stop control on UAS Connector/North UAS Access at Mendenhall Loop Road

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Alternative 3

Geometric Improvements

- Minor realignment of the Fritz Cove Road and South UAS Access legs at the Glacier Highway intersection
- Curve Corrections at Stablers Point

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Corridor Study

Alternative 3

Preliminary Project Costs

Design	\$ 3,920,000
Right of Way	[pending]
Utilities	[pending]
Construction	39,170,000
Construction Engineering	5,880,000
TOTAL	>\$ 48,970,000



Right of Way & Utility Impacts

	Alt. 1	Alt. 2	Alt. 3
Remove house	3	4	6
Remove garage	3	1	1
Major change in or remove access to structure			7
Substantial change in access grade	11	7	7
Relocate power pole	13	10	3
Remove parking spaces	13	2	2
Extend fire hydrants to back of sidewalk	X	X	
Sewer manholes located in travel lanes	X	X	
Extend large culvert at Auke Creek	X	X	

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Corridor Study

Auke Bay Corridor Study

Final Report on Traffic Issues to the
Citizens Advisory Committee

DOT&PF Southeast Region

Prepared by USKH, Inc. / Kinney Engineering

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Corridor Study

For No-Build Existing Conditions, and Alternatives 1 through 3, we'll discuss

- Future Alternative Volumes
- Future Alternative Traffic Performance
- Future Alternative Accident Safety Aspects

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Corridor Study

Volumes

- Developed Alternative Average Daily Traffic (AADT) for Years 2009 (Construction), 2019 (Mid-Life) and 2029 (Design)
- Developed hourly turning movements for morning and evening peak hours (30th Highest Hour), for each year
- Use results of Origin-Destination Study, existing counts, and travel time spreadsheet models to forecast link volumes

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Corridor Study	Glacier Highway			Mendenhall Loop Road	
	<i>Ferry Terminal to Auke Nu Drive</i>	<i>Auke Nu Drive to Harbor Drive</i>	<i>Harbor Drive to Fritz Cove Road</i>	<i>Glacier to UAS North Access</i>	<i>UAS Outbound (Alt 1&2) or to By Pass (Alt 3)</i>
Current (2001)	4,117	5,668	7,977	2532	
2029 No-build and Alternative 1	6,840	8,140	15,710	4800	
2029 Alternative 2	6,000	7,300	15,710	7,000	5,900
2029 Alternative 3	6,000	3,600	10,300	3,000	4,600

Alternative 2 By Pass carries 800 AADT

Alternative 3 By Pass carries 4000 to 9000 AADT



Traffic Performance

We looked at several Performance Measures for traffic carrying efficiency:

- Delay time per vehicle (Seconds/Vehicle)
- Level of Service (A through F)
- Total System Peak Hour Travel Time by all Motorists (Hours)
- Average Travel Speed, compared to posted speed (MPH)
- Volume to Capacity Ratio (How full is the system elements?)



Defining Level of Service (LOS)

- LOS is a qualitative measure in A, B, C, D, E, F.
- LOS “A” is free flow with no congestion and minimal delay; and F implies that the facility doesn’t have the capacity to carry the traffic load (stop and go, long delays, slow speeds).
- Desirable Design Year (2029) LOS is “C”. However, a Design Year LOS “D” is acceptable for most urban areas.

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Corridor Study

Stop Sign and Roundabouts (delay in seconds / vehicle)

LOS A: =10 seconds

LOS B: >10 and =15 seconds

LOS C: >15 and =25 seconds

LOS D: >25 and =35 seconds

LOS E: >35 and =50 seconds

LOS F: >50 seconds

Signals (delay in seconds/vehicle)

LOS A: =10 seconds

LOS B: >10 and =20 seconds

LOS C: >20 and =35 seconds

LOS D: >35 and =55 seconds

LOS E: >55 and =80

LOS F: >80 seconds

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Corridor Study

Urban Streets (between signals)

LOS A: >35 mph

LOS B: >28-35 mph

LOS C: >22-28 mph

LOS D: >17-22 mph

LOS E: >13-17 mph

LOS F: =13 mph

Class I 2-Lane Highways

LOS A: =35 % Time Following, > 55 mph travel speed

LOS B: >35 and =50 % Time Following, 50 to 55 mph

LOS C: >50 and =65 % Time Following, 45 to 50 mph

LOS D: >65 and =80 % Time Following, 40 to 45 mph

LOS E: >80 % Time Following, = 40 mph.

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- Most of the study area is considered to operate as interrupted-flow facilities. As such, intersections are the critical system element.
- Uninterrupted flow facilities include Glacier Hwy, Waydelich to Ferry Terminal and By Pass segments.



Intersection Control

- Signals- Must meet one or more nationally and State-accepted warrants. Unwarranted installations can cause excessive total delay and more accidents.
- Unsignalized- Stop signs control minor approaches.
- Roundabouts- Can be superior to both signals and unsignalized control. They have volume limits and sometimes aren't suitable in high pedestrian activity areas.



Levels of Service for Existing Conditions (No-Build)

- All intersections are stop-sign controlled on minor approaches.
- Currently, PM LOS is unacceptable (LOS E/F) for north and south approaches at Fritz Cove intersection.
- Wye intersection and Harbor Dr intersection will have a PM Peak Hour LOS of “F” by 2029.



Design Year (2029) PM LOS for Alternative Intersections

Intersection	Alternative 1		Alternative 2		Alternative 3	
	Intersection Control	LOS	Intersection Control	LOS	Intersection Control	LOS
Glacier Highway-Fritz Cove Road- UAS South Entrance	Single-Lane Roundabout	A	Single-Lane Roundabout	A	*Stop Sign (New LT Lanes N&S)	NB and SB LT are F, Other movements at C or better
Glacier Highway- Mendenhall Loop Road (Reconfigured into a Tee intersection)	Single-Lane Roundabout	B	Reconfigured Tee Intersection with Signal	C	Reconfigured Tee Intersection with Stop Sign	D
Mendenhall Loop Road- UAS North Entrance-Guard/By Pass Access	Stop Sign	C/D	Single-Lane Roundabout	A	Stop Sign	C
Glacier Highway- By Pass (New formed by By-Pass West Terminus, near Ferry Terminal)			Stop Sign	B	Stop Sign	B
By Pass-Mendenhall Loop Road (New)				Signal with LT lanes	C	
By Pass-UAS Access				Stop Sign	B	
Glacier Highway-East By Pass-Industrial Boulevard (New formed by By Pass East Terminus)				Signal	C	



Design Year (2029) PM LOS for Alternative Street Segments

Segment	Alternative 1		Alternative 2		Alternative 3	
	Lanes	LOS	Lanes	LOS	Lanes	LOS
Glacier Highway, Fritz Cove through Commercial Area	3-Lane	D	3-Lane / 2-Lane	E	2-lane	C
Glacier Highway, Outbound to Ferry Terminal	2-lane	C	2-lane	C	2-lane	C
Mendenhall Loop Road	2-lane	C	2-lane	C	2-lane	B
By-Pass, Alternative 2			2-lane	C		
By-Pass, Alternative 3					2-lane	C



Design Year Segment Speeds (Simulation)

	Posted Speed	2029 PM Traffic			
		No-Build, Existing Conditions	Alternative 1	Alternative 2	Alternative 3
Glacier Highway, Fritz Cove through Commercial Area	35 MPH (45 MPH to NOAA)	24 MPH	18 MPH	16 MPH	27 MPH
Glacier Highway, Outbound to Ferry Terminal	45 MPH	41 MPH	41 MPH	37 MPH	40 MPH
Mendenhall Loop Road	40-45 MPH	11 MPH	26 MPH	25 MPH	28 MPH
By-Pass, Alternative 2	45 MPH (estimated)			31 MPH	
By-Pass, Alternative 3	45 MPH (estimated)				37 MPH



Design Year Delay and Travel Time (Simulation)

2029 PM Traffic		
Alternative	Delay Experienced in System (Seconds / Vehicle)	Cumulative Travel Time (hours) During PM Peak Hour
Alternative 1	227	369
Alternative 2	187	339
Alternative 3	130	266
No-Build, Existing Conditions	346	441

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Corridor Study

Accident Issues

- Wye has accident rate and frequency (18 in 5 years). Likely attributed to the configuration.
- Glacier Hwy past Waydelich Creek has a high rate, with six accidents within or near horizontal curve that doesn't meet design or posted speed.
- Accident severity is high.

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Intersections Safety Improvements

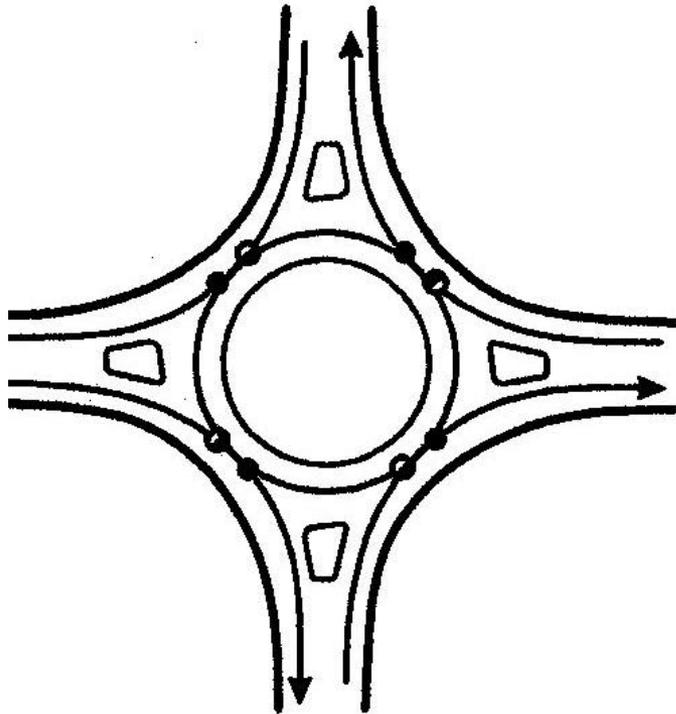
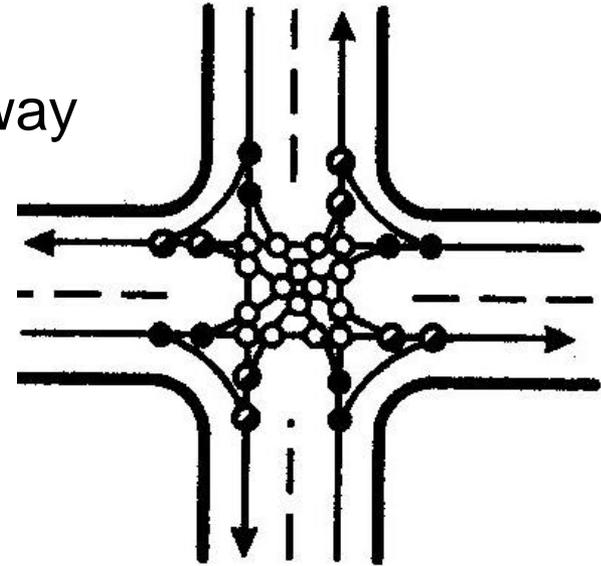
- Where needed, intersection will be reconfigured or signalized.
- Most dramatic improvement occurs with Roundabouts.

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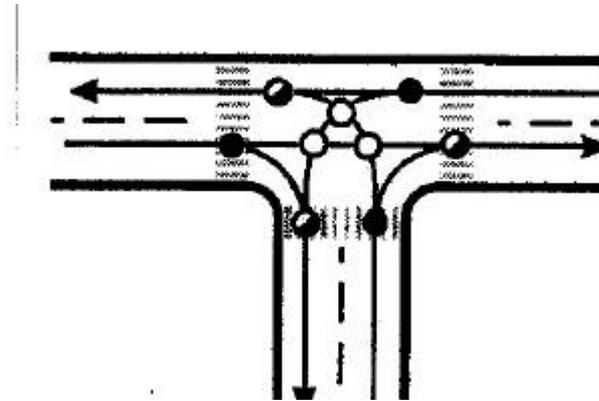


Corridor Study

32 Conflicts for 4-way



8 Conflicts for a 4-way RAB



9 Conflicts for Tee

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Roadway Safety Improvements

- Center-Two-Way-Left-Turn-Lane
- Realign Horizontal Curves, Improve Radius to match travel speeds
- Pedestrian Facilities

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Corridor Study

Alternative Accident Summary

	Current	2029 No- Build / No Action	2029 Alternative 1	2029 Alternative 2	2029 Alternative 3
Estimated Annual Accidents	13	24	16	19	25
Estimated Annual Public Costs	\$544,120	\$ 994,808	\$ 469,936	\$ 615,126	\$ 617,460

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Corridor Study

Environmental Issues

	Alternative 1	Alternative 2	Alternative 3
Wetland Fill (Acres)	1.2	5.3	10.0
Stream Impacts (Culverts)	<u>Reroute/Replace</u> <ul style="list-style-type: none">•Auke Creek <u>Extension</u> <ul style="list-style-type: none">•Waydelich Creek•Bay Creek•Auke Nu Creek	<u>Reroute/Replace</u> <ul style="list-style-type: none">•Auke Creek <u>New Crossing</u> <ul style="list-style-type: none">•Auke Nu Creek	<u>New Crossing</u> <ul style="list-style-type: none">•Auke Nu Creek•Unnamed Creek•Lake Creek

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Corridor Study

Environmental Issues

	Alternative 1	Alternative 2	Alternative 3
Issues (+/-)	<ul style="list-style-type: none"> -Community Cohesion: Wider transportation corridor transects community +Pedestrians And Bicyclists: Wider shoulders, more sidewalk, separated pathway from Waydelich Creek to ferry terminal +Decrease congestion, improve access to schools, churches, emergency response -Travel Pattern: Out of direction travel for Caroline St. due to median -No direct access from DeHart's to Glacier Highway 	<ul style="list-style-type: none"> +Community Cohesion: Main route bypasses the community +Pedestrians And Bicyclists: Wider shoulders, more sidewalk, separated pathway from Waydelich Creek to ferry terminal +Decrease congestion, improve access to schools, churches, emergency response +DeHart's has direct access to Glacier Highway -Increased traffic volume on UAS Joint Use Facility access -Crosses Spaulding Meadows trail 	<ul style="list-style-type: none"> +Community Cohesion: Main route bypasses the community +DeHart's has direct access to Glacier Highway +Decrease congestion, improve access to schools, churches, emergency response -Increased traffic volume on UAS Joint Use Facility access -Crosses Spaulding Meadows trail

**Appendix Z. Engineering Preferred Alternative Detailed Cost
Estimate**

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Design and Engineering Services

Glacier Highway Recon Study

Project No. 722100

Item No	Pay Item	Pay Unit	Unit Price
202 (2)	Removal Of Pavement	Square Yard	\$2.50
202 (3)	Removal Of Sidewalk	Square Yard	\$5.00
202 (4)	Removal Of Culvert Pipe	Linear Foot	\$10.00
202 (9)	Removal Of Curb And Gutter	Linear Foot	\$2.00
203 (3)	Unclassified Excavation	Cubic Yard	\$4.00
203 (5)	Borrow	Cubic Yard	\$6.00
301 (1)	Aggregate Base Course, Grading D-1	Ton	\$30.00
304 (1)	Subbase, Grading A	Ton	\$15.00
308 (1)	Crushed Asphalt Base Course	Square Yard	\$3.00
308 (2)	CSS-1 Asphalt for Base Course	Ton	\$350.00
401 (1)	Asphalt Concrete, Type II, Class B	Ton	\$65.00
401 (2)	Asphalt Cement, Type PG58-28	Ton	\$350.00
402 (1)	STE-1 Asphalt for Prime Coat	Ton	\$400.00
603 (17)	Pipe	Linear Foot	\$75.00
603	Stream Crossing	Linear Foot	\$3,700.00
604 (4)	Adjust Existing Manhole	Each	\$1,000.00
608 (2)	Asphalt Sidewalk	Square Yard	\$20.00
609 (2)	Curb and Gutter, Type 1	Linear Foot	\$30.00
615 (1)	Standard Sign	Square Foot	\$60.00
640 (1)	Mobilization and Demobilization	Lump Sum	10%
641 (1)	Erosion and Pollution Control Administration	Lump Sum	4%
642 (1)	Construction Surveying	Lump Sum	4%
643 (2)	Traffic Maintenance	Lump Sum	10%
670 (1)	Painted Traffic Markings	Lump Sum	\$20,000.00
670 (8)	Recessed Pavement Markers	Each	\$50.00
660	Lighting	Lump Sum	\$300,000.00

Construction Contingency	20%
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Near-Term	
Quantity	Subtotal
41,991	\$104,978
2,265	\$11,325
100	\$1,000
3,706	\$7,412
363,472	\$1,453,888
47,511	\$285,066
2,197	\$65,910
7,690	\$115,350
43,557	\$130,671
393	\$137,550
4,918	\$319,670
295	\$103,250
25	\$10,000
1,000	\$75,000
284	\$1,050,800
15	\$15,000
12,753	\$255,060
10,358	\$310,740
250	\$15,000
	\$560,000
	\$179,000
	\$179,000
	\$447,000
1	\$20,000
100	\$5,000
1	\$300,000
Subtotal	\$6,157,670
	\$1,231,534
Construction Total	\$7,389,203

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Design and Engineering Services

Glacier Highway Recon Study

Project No. 722100

Long-Term – Phase I

Item No	Pay Item	Pay Unit	Unit Price
202 (2)	Removal Of Pavement	Square Yard	\$2.50
203 (3)	Unclassified Excavation	Cubic Yard	\$3.00
203 (5)	Borrow	Cubic Yard	\$5.00
301 (1)	Aggregate Base Course, Grading D-1	Ton	\$30.00
304 (1)	Subbase, Grading A	Ton	\$15.00
308 (1)	Crushed Asphalt Base Course	Square Yard	\$3.00
308 (2)	CSS-1 Asphalt for Base Course	Ton	\$350.00
401 (1)	Asphalt Concrete, Type II, Class B	Ton	\$65.00
401 (2)	Asphalt Cement, Type PG58-28	Ton	\$350.00
402 (1)	STE-1 Asphalt for Prime Coat	Ton	\$400.00
603 (17)	Pipe	Linear Foot	\$75.00
604 (4)	Adjust Existing Manhole	Each	\$1,000.00
615 (1)	Standard Sign	Square Foot	\$60.00
640 (1)	Mobilization and Demobilization	Lump Sum	10%
641 (1)	Erosion and Pollution Control Administration	Lump Sum	4%
642 (1)	Construction Surveying	Lump Sum	4%
643 (2)	Traffic Maintenance	Lump Sum	\$500,000.00
670 (1)	Painted Traffic Markings	Lump Sum	\$25,000.00
670 (8)	Recessed Pavement Markers	Each	\$50.00
660	Lighting	Lump Sum	\$200,000.00
660(1a)	Traffic Signal Sytem Complete	Lump Sum	\$300,000.00

Quantity	Subtotal
1,601	\$4,002.50
2,045,571	\$6,136,713.00
258,245	\$1,291,225.00
17,042	\$511,260.00
59,647	\$894,705.00
7,511	\$22,533.00
94	\$32,900.00
9,691	\$629,915.00
581	\$203,350.00
49	\$19,600.00
9,000	\$675,000.00
5	\$5,000.00
250	\$15,000.00
	\$1,261,000.00
	\$418,000.00
	\$418,000.00
1	\$500,000.00
1	\$25,000.00
250	\$12,500.00
1	\$200,000.00
2	\$600,000
Subtotal	\$13,875,703.50
	\$2,775,140.70
Construction Total	\$16,650,844.20

Construction Contingency 20%

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Design and Engineering Services

Glacier Highway Recon Study Project No. 722100

Long-Term – Phase II

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Subtotal
202 (4)	Removal Of Culvert Pipe	Linear Foot	\$10.00	100	\$1,000.00
203 (3)	Unclassified Excavation	Cubic Yard	\$3.00	809,115	\$2,427,345.60
203 (5)	Borrow	Cubic Yard	\$5.00	130,755	\$653,774.50
301 (1)	Aggregate Base Course, Grading D-1	Ton	\$30.00	20,925	\$627,750.00
304 (1)	Subbase, Grading A	Ton	\$15.00	73,237	\$1,098,555.00
308 (1)	Crushed Asphalt Base Course	Square Yard	\$3.00	3,971	\$11,913.00
308 (2)	CSS-1 Asphalt for Base Course	Ton	\$350.00	50	\$17,500.00
401 (1)	Asphalt Concrete, Type II, Class B	Ton	\$65.00	17,912	\$1,164,280.00
401 (2)	Asphalt Cement, Type PG58-28	Ton	\$350.00	1,075	\$376,250.00
402 (1)	STE-1 Asphalt for Prime Coat	Ton	\$400.00	91	\$36,400.00
603 (17)	Pipe	Linear Foot	\$75.00	9,000	\$675,000.00
608 (1b)	Asphalt Sidewalk, 2 inches thick	Square Yard	\$20.00	1,167	\$23,340.00
609 (2)	Curb and Gutter, Type 1	Linear Foot	\$30.00	875	\$26,250.00
611(1)	Riprap, Class III	Cubic Yard	\$20.00	5,000	\$100,000.00
615 (1)	Standard Sign	Square Foot	\$60.00	250	\$15,000.00
640 (1)	Mobilization and Demobilization	Lump Sum	10%		\$879,000.00
641 (1)	Erosion and Pollution Control Administration	Lump Sum	\$500,000.00	1	\$500,000.00
642 (1)	Construction Surveying	Lump Sum	\$500,000.00	1	\$500,000.00
670 (1)	Painted Traffic Markings	Lump Sum	\$25,000.00	1	\$25,000.00
670 (8)	Recessed Pavement Markers	Each	\$50.00	250	\$12,500.00
643 (2)	Traffic Maintenance	Lump Sum	\$200,000.00	1	\$200,000.00
660	Lighting	Lump Sum	\$300,000.00	1	\$300,000.00
				Subtotal	\$9,670,858.10
Construction Contingency 20%					\$1,934,171.62
				Construction Total	\$11,605,029.72

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Design and Engineering Services

Glacier Highway Recon Study Project No. 722100

Seawalk/Multi-use Path

Item No	Pay Item	Pay Unit	Unit Price
203 (5)	Borrow	Cubic Yard	\$5.00
301 (1)	Aggregate Base Course, Grading D-1	Ton	\$30.00
304 (1)	Subbase, Grading A	Ton	\$15.00
603 (17)	Pipe	Linear Foot	\$75.00
608 (2)	Asphalt Sidewalk	Square Yard	\$20.00
611(1)	Riprap, Class III	Cubic Yard	\$20.00
615 (1)	Standard Sign	Square Foot	\$60.00
640 (1)	Mobilization and Demobilization	Lump Sum	10%
641 (1)	Erosion and Pollution Control Administration	Lump Sum	\$50,000.00
642 (1)	Construction Surveying	Lump Sum	\$50,000.00
643 (2)	Traffic Maintenance	Lump Sum	\$50,000.00

Construction Contingency 20%

Quantity	Subtotal
12,000	\$60,000.00
2,400	\$72,000.00
4,800	\$72,000.00
500	\$37,500.00
7,151	\$143,020.00
5,000	\$100,000.00
50	\$3,000.00
	\$64,000.00
1	\$50,000.00
1	\$50,000.00
1	\$50,000.00
Construction Total =	
	\$701,520.00
	\$140,304.00
Project Total =	
	\$841,824.00