

Strategic Tribal Transportation Safety Plan

November 2020

Organized Village of Kasaan



Organized Village of Kasaan
STRATEGIC TRIBAL TRANSPORTATION SAFETY PLAN

Tribal Transportation Program
Number: E09-238

Prepared For:

Organized Village of Kasaan

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Prepared By:

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November 2020

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ADOT&PF	Alaska Department of Transportation and Public Facilities
ADT	Average Daily Traffic
ANCSA	Alaska Native Claims Settlement Act
ATV	All-Terrain Vehicle
BIA	Bureau of Indian Affairs, Department of the Interior
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
COE	Corps of Engineers
DCCED	Department of Commerce, Community and Economic Development
DOI	Department of the Interior
DOT	Department of Transportation
FAST ACT	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration, Department of Transportation
FTA	Federal Transit Administration, Department of Transportation
HSIP	Highway Safety Improvement Program
LRTP	Long-Range Transportation Plan
MUTCD	Manual of Uniform Traffic Safety Devices
NBTI	National Bridge and Tunnel Inventory
NEPA	National Environmental Policy Act
NTTFI	National Tribal Transportation Facility Inventory
RPKA	Rodney P. Kinney Associates
STIP	Statewide Transportation Improvement Program
TTIP	Tribal Transportation Improvement Program
TTP	Tribal Transportation Program
U.S.C.	United States Code
USGS	United States Geological Survey

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INTRODUCTION

The Organized Village of Kasaan (OVK) identified the need to formulate and implement a Strategic Tribal Transportation Safety Plan (Safety Plan) that will facilitate in securing funding to improve Kasaan's transportation network, reduce injuries, and save lives in the community. The development and implementation of this Safety Plan is funded through a set-aside from the Tribal Transportation Program (TTP) under Fixing America's Surface Transportation Act (FAST Act), Title 23 USC 202(e).

This Safety Plan serves as a comprehensive source for OVK to identify and address transportation risk factors that have a potential of leading to serious injury or death in Kasaan. This plan will review existing safety activities, as well as identify areas with opportunity for improvements and strategies to address the opportunity areas. Emphasis areas will be collaboratively determined with goals and strategies that integrate the 4 E's of Safety: Engineering, Education, Enforcement, and Emergency Medical Services. Implementation and evaluation of this plan will further improve transportation safety for the Tribe, its people, and its visitors.

OVK is committed to reducing the risk of deaths and serious injuries as a result of incidents that occur on the transportation system throughout the community. The Tribe developed this Safety Plan in cooperation with Federal, State, Borough, and City government agencies, as well as other private agencies, as part of an ongoing effort to make safety improvements align with their efforts on national safety initiatives and strategies.

VISION

To reduce serious injury and prevent tragedies throughout Kasaan's transportation network.

MISSION

To eliminate serious injuries through a celebrative community and multiagency approach that utilizes education, enforcement, engineering, and emergency service strategies.

GOAL

Protect future generations by preventing serious injury and fatalities on and throughout Kasaan's transportation network.

BACKGROUND

Kasaan is a traditional Haida community that relies heavily on a subsistence lifestyle. Kasaan is like most rural communities in Alaska in that the cost of living is relatively high, while job opportunities and housing are in short supply.

Kasaan is located on the east coast of Prince of Wales Island in Southeast, Alaska. Kasaan is approximately 49 road miles northeast of Klawock, 23 road miles south of Thorne Bay, and 30 air miles northwest of Ketchikan. Kasaan's geographical coordinates are approximately 55°32'22" North Latitude and 132°24'14" West Longitude. Kasaan is within Township 73 South, Range 85 and 86 East, Copper River Meridian.

Kasaan is connected to the National Highway System solely through the Alaska Marine Highway. Each community on Prince of Wales Island, including Kasaan, has a local road system within its own town site and is connected to other communities on Prince of Wales Island via State Highways. Kasaan is connected to Craig, Klawock, Thorne Bay, Hydaburg, and Hollis by the three main roads on Prince of Wales Island: Hydaburg Highway, Thorne Bay Road, and Craig-Klawock-Hollis Highway. Although Kasaan is connected to other communities on Prince of Wales Island, they still have limited accessibility by air and waterways to major hubs, as well as the main road system.

Water transportation is a unique, yet critical, transportation need in Alaska due to the abundance of waterways and lack of roadway networks. Small boats provide transportation for economic development, and barges transport supplies, bulk fuel, and construction materials for many community projects. The Alaska Marine Lines operates a weekly barge service to Thorne Bay, and Petro Marine barges bulk fuel to Craig.

Air transportation is also extremely important for Kasaan. Kasaan relies on air transportation for travel and for the delivery of various supplies and mail. The Klawock Airport, state-owned and managed, has one runway and serves scheduled and chartered air services from Ketchikan and Sitka. Daily flight services deliver passengers, mail, and other cargo year-round to Klawock. The airport in Klawock has an Automated Surface Observing System (ASOS) that provides accurate, real-time weather forecasts to help pilots and dispatchers make safe decisions on expected conditions at the time of arrival. A seaplane base is operated by the State out of Kasaan Bay. The community is interested in constructing an emergency medivac heliport in Kasaan.

SAFETY PARTNERS

The safety partners include Tribal, Federal, State, local, and private entities who represent engineering, enforcement, education, and emergency medical services who are stakeholders in transportation safety. Safety partners provide data, assist OVK in developing safety strategies, and will assist OVK in the implementation of the emphasis areas in the final plan. Present and future safety partners used for the development and/or implementation of this plan are listed below.

- Alaska Department of Transportation and Public Facilities (ADOT&PF)
- Alaska Department of Health and Social Services, Division of Public Health (DPH)
- City of Kasaan
- Kasaan Volunteer Fire Department
- The Southeast Island School District
- Kalvico, Incorporated
- City of Thorne Bay
- Thorne Bay Volunteer Fire Department
- Central Council Tlingit and Haida Indian Tribes of Alaska (CCTHITA)
- Alaska State Troopers (AST)
- Alaska Search and Rescue (ASAR)
- Southeast Alaska Regional Health Consortium (SEARHC)
- Sealaska Corporation
- U.S. Forest Service (USFS)

TRANSPORTATION SAFETY FUNDING

The new highway funding bill, FAST Act continues funding for the successful Highway Safety Improvement Program (HSIP) because of the strong results achieved in reducing fatalities. Under HSIP, tribes must develop and implement a safety plan that identifies transportation safety problems and a strategy to address them. A portion of TTP funding is available for tribes to carry out safety specific activities, projects, and developing plans in accordance with 23 U.S.C. § 202(e).

DATA ANALYSIS

RPKA collected and analyzed crash data to validate the Tribe's and stakeholders' safety concerns and to determine any additional safety concerns in the Kasaan community. Concerns expressed by OVK and crash data analysis were used to determine the emphasis areas addressed in this plan.

EXISTING EFFORTS

Prior to the development of this plan, several activities, programs, and policies were already in place, or in the works, to address transportation safety. These efforts are regularly evaluated, considered beneficial at this time, and will continue to be implemented for the foreseeable future. The existing efforts already in place include the following:

SEARCH AND RESCUE

OVK has a volunteer-based search and rescue organization.

KIDS DON'T FLOAT

The City of Kasaan provides free personal flotation devices for community members, specifically for children and young adults, and annually restocks the eight Kids Don't Float Stations. According to the Alaska Office of Boating Safety, Kids Don't Float is a statewide injury prevention program that addresses Alaska's high child and youth drowning rate. Most residents in the community, including Tribal citizens, frequently travel by boat and rely heavily on Kids Don't Float supplies.

ROADSIDE SAFETY AUDIT

Two roadway safety audits were conducted on the Kasaan Road: the first was completed in 2006 by the Alaska Department of Transportation Federal Highway Administration and West Federal Lands Highway Division; the second was conducted by Iowa State University, in partnership with the Federal Highway Administration and the Tribal Transportation Assistance Program, which was completed in 2010.

SAFETY DATA COLLECTION:

OVK maintains an accident log for the community, which specifically maintains an accident record by milepost for the Kasaan Road. This is an internal accounting of accidents that are not included in the Alaska accident database.

DATA SUMMARY

Due to the small size and rural location, there are currently no combined systems in place for tracking data. Most available crash data for the region comes from the Alaska Department of Transportation and Public Facilities (ADOT&PF), Division of Program Development. The most recent data available is from 2009 through 2016. The data was either not relevant or incomplete to use for analysis. We also reviewed the Alaska Trauma Database, but again the data was not specific enough for use in an analysis.

OVK has collected crash data on the Kasaan Road; it is the best source of accident data for Kasaan. The previous safety plan highlighting a map of accidents along Kasaan Road is attached as an appendix to this document. Accident pictures have also been cataloged, but there was no specific time and date information included with the photographs.

DATA EVALUATION

The compiled data presented above was analyzed to find patterns and trends occurring in accidents and injuries. We found there is a data correlation between the two roadway safety audits that have been completed on the Kasaan Road and the crash data that was collected by OVK. We found that two main areas of the Kasaan Road have the majority of accidents, they are locally referred to as “1.5 and 2.0 mile” corners and “Killer Hill”; both of these locations have had multiple accidents. Other locations along the roadway have also had accidents. Fortunately, no fatalities have occurred at these locations; however, all the accidents have been roadway departure accidents, which in accordance with the Tribal Transportation Strategic Safety Plan, are the deadliest type of accidents on Tribal roadways.

1.5 and 2.0 Mile Corners, Kasaan Road

In this location, the Kasaan Road was constructed by the Forest Service as a resource development road. The existing gravel road takes a sharp turn and the curve is super elevated, unshielded, and surface is wash boarded which contributes to the accidents. This corner has been involved with several of the accidents, all of which were considered roadway departure accidents.

Killer Hill, Mile 6, Kasaan Road:

In this location, the Kasaan Road was constructed by the Bureau of Indian Affairs. The single-lane road goes through a series of two single-lane bridges, then take a sharp curve to the right and immediately climbs. This location was identified in both of the roadside safety audits as a safety issue. The roadway is not shielded in this location, and the surface of the roadway is wash boarded, furthermore the roadway geometry i.e. (steep grade and sharp corner) contributes to the safety issues at this location.

EVALUATION AND IMPLEMENTATION

OVK has the authority to implement and evaluate this plan. The implementation of this plan will follow the same procurement policies that are already in place and OVK uses these guidelines when managing other Federal grants and contracts. This plan should be evaluated annually, for four years, and updated every five years. Annual evaluations can facilitate identification of trends in goals, and will be beneficial for funding grants that could be sought in the future.

OVK will establish a local coordinating committee that will consist of multiple directors from within OVK, including the Transportation Department, and will be the entity that makes important decisions involving this Safety Plan. The coordinating committee should meet on a regular basis to analyze any new data, evaluate the success of this plan, determine if there is a need for any immediate changes to the strategies presented in this plan, and be able to summarize their analysis and report back to OVK on a routine basis. The coordinating committee should also communicate with other stakeholders annually. Any concerns that the other stakeholders have could be addressed at the following Tribal Council meeting. This communications procedure will serve to update stakeholders and ensure that all intended goals are being met, as well as discuss additional strategies or funding, as it becomes available.

In order to reach this goal, the following emphasis areas were identified to address the safety (concerns) throughout the community and OVK's road system.

1. Kasaan Road;
2. Community Public Safety;
3. Off-Road Transportation.

EMPHASIS AREAS

The ultimate goal of this Safety Plan is to reduce the number of injuries and prevent fatalities on OVK's transportation network. In order to reach this goal, the following safety emphasis areas were identified throughout the community. These emphasis areas will incorporate the Four E's of Safety: Engineering, Education, Enforcement, and Emergency Medical Services (EMS). In addition, the emphasis areas were collaboratively determined to ensure that the transportation safety goals are achieved. In an effort to further enhance safety efforts and save lives, the following items were identified by this plan as a priority for the Tribe over the next five years.

KASAAN ROAD

OVK would like to make safety improvements at locations on the Kasaan Road. The Kasaan Road is an essential facility and is the only road in and out of Kasaan. The road is a school bus route and used by residences for work both in and out of Kasaan. Safety improvements to the Kasaan Road are a priority for OVK.

ENGINEERING

Strategy 1. Engineered Site Improvements

Background and Purpose:

To provide and implement an engineering solution to hazard areas of the Kasaan Road, which will serve as a basis for reducing the chance of major injuries and fatalities. This work includes improvements to the geometry of the roadway and running surface, installation of guardrails and terminals in appropriate locations, and installation of appropriate signage and delineators.

Objective: Prevent injuries and fatalities on the Kasaan Road from roadway departures.

Lead Agency: OVK

Action 1.1: The Tribe will work to provide and implement safety related improvements to high risk areas of the roadway.

EMERGENCY SERVICES

Strategy 2. Emergency Preparedness

Background and Purpose:

Preparedness is the cornerstone for being able to react to emergencies on the Kasaan Road. This includes ensuring that emergency call boxes and shelters are available periodically along the roadway.

Objective: To improve the safety of the traveling public, emergency call boxes and shelters will be constructed periodically along the Kasaan Road.

Lead Agency: OVK

Action 2.1: The Tribe will work with Federal, State, and Local entities to develop a plan to install the call boxes and shelters.

COMMUNITY PUBLIC SAFETY

The Tribe would like to improve community public safety on local roadways. Kasaan is a small community with a multi-modal transportation network that is used by residents, including minors, and visitors. Community-wide safety awareness is important because of these various types of users.

EDUCATION

Strategy 1: Training

Background and Purpose:

Educating the community is a critical step to prevent injuries and fatalities in remote locations in and around Kasaan. When major accidents occur on Kasaan's transportation network, especially in areas that are not easily accessible, immediate response is crucial to the survival of the people in need. Training community members to recognize and be prepared for dangerous and life-threatening situations can significantly reduce serious injuries and fatalities on OVK's transportation networks.

Objective: Reduce the number of injuries and fatalities in and near Kasaan.

Lead Agency: OVK

Action 1.1: Educational Training

The Tribe will provide training for both the community and youth on first aid and CPR.

ENGINEERING

Strategy 2. Engineering

Background and Purpose:

Providing and implementing engineering solutions to hazard areas within the community of Kasaan by providing a basis to reduce the chance of major injuries and fatalities on the roadways and boardwalks within the community. This work includes improving lighting around the community, installing surveillance including alert/distress system, installing guardrails and terminals in appropriate locations, installation of appropriate signage and delineators, maintaining sight distance along streets and trails through brush cutting, and dust remediation.

Objective: Prevent injuries and fatalities within the community of Kasaan.

Lead Agency: OVK

Action 2.1: The Tribe will work to provide and implement safety related improvements to high risk areas within the community roadways, bridges and boardwalks.

EMERGENCY SERVICES

Strategy 3. Emergency Preparedness

Background and Purpose:

Community preparedness is the cornerstone in being able to react to emergencies in the community. This includes ensuring the plans are in place to be implemented in the event of an emergency and the correct equipment, including hand sanitizer and first aid stations, personnel, and vehicles are available. This work includes developing a coordinated response plan for the community, that ensures the Tribe, City, School District, and SEACH are coordinated in their response.

Objective: To ensure the community of Kasaan is prepared for emergency events and has response planning and communication in place, and equipment, including hand sanitizer and first aid stations available.

Lead Agency: OVK

Action 3.1: The Tribe will work with Federal, State, and Local entities to develop an emergency preparedness plan.

Action 3.2: The Tribe will work to acquire emergency equipment including communication, personal protective equipment, including hand sanitizer and first aid stations, lifesaving, and response vehicles.

OFF HIGHWAY TRANSPORTATION

Tribal citizens use off road transportation to travel throughout areas surrounding Kasaan. Off-road transportation typically consists of ATVs, boats and skiffs, and snow machines; significant subsistence and recreational areas exist in Kasaan.

EDUCATION

Strategy 1: Safety and Preparedness

Background and Purpose:

Subsistence and recreational activities are common practice with the Tribal citizens of Kasaan. The majority of serious injuries occur while utilizing ATVs, boats/skiffs, or snow machines. The amount of time it takes first-responders to help people in distress is unpredictable. Because some accidents occur so quickly, self-rescue is often the only chance of survival. Community-wide survival training, coupled with readily available survival gear and supplies, can mean the difference between life and death.

Objective: Reduce the number of injuries, while utilizing off-highway transportation.

Lead Agency: OVK

Action 1.1: Educational Training

Work with local Tribal citizens to conduct community-wide survival and emergency preparedness training.

Action 1.2: Survival Equipment

Provide basic survival gear and supplies to people traveling outside of the community.

EMERGENCY MEDICAL SERVICES

Strategy 2: Locator Devices

Background and Purpose:

Personal locator devices, such as a SPOT device, can provide a critical link in providing location coordinates for those who have become disoriented, injured, and in need of rescue during winter and summer travel. Personal locator devices could be rented out to people traveling outside of the community and would require users to file a travel plan. If an individual is lost or stranded, the device can be activated, and would assist rescue teams with determining the individual's location.

Objective: Reduce the number of injuries, while utilizing off-highway transportation.

Lead Agency: OVK

Action 2.1: Locator Devices

Purchase and make SPOT devices available to Tribal citizens for use while traveling outside the community.

REFERENCES

Alaska Department of Community, Commerce, and Economic Development (DCCED). *Community Database Online*.

Alaska Department of Transportation & Public Facilities. *Southeast Alaska Transportation Plan Draft*, 2014.

Alaska State Department of Health and Social Services, Division of Public Health. Alaska Trauma Registry. 2015.

Federal Highway Administration. *FAST Act, Tribal Transportation Program, Safety Projects*. §1119; 23 USC 202(e). 2012.

U.S. Coast Guard. Boating Safety Resource Center.

APPENDIX

2014 ORGANIZED VILLAGE OF KASAAN SAFETY PLAN



ORGANIZED VILLAGE OF KASAAN
DEPARTMENT OF TRANSPORTATION
SAFETY PLAN



STOP ACCIDENTS BEFORE THEY STOP YOU
STAY ALIVE - THINK & DRIVE



ORGANIZED VILLAGE OF KASAAN

P. O. Box 26-Kasaan
(907) 542-2230

■ Ketchikan, Alaska 99950-0340
■ (fax) 907-542-3006

Tribal Transportation Safety Plan (TTSP)

Mission Statement

The Organized Village of Kasaan is committed to promoting, preserving, and protecting indigenous Haida identity and values. For our elders and youth, we look to the future in unity, by developing economic opportunities, promoting education and utilizing our cultural, natural and social resources.

Summary

We don't inherit the earth from our ancestors; we borrow it from our children. With the emphasis on Target Zero, and safety in Moving Ahead for Progress in the 21st Century (MAP-21), the Organized Village of Kasaan has the privilege to create a Tribal Transportation Safety Plan. The Organized Village of Kasaan has created a committee to create a comprehensive Tribal Transportation Safety Plan, under the direct supervision from the OVK Tribal Council, Tribal Administrator, Tribal Transportation Director. This planning committee identified three priorities for improving transportation safety for the Organized Village of Kasaan. Two of these priorities were identified based on an analysis of the transportation incidents that have led to serious injury and death in the recent past. Those priorities are:

1. Safety Improvement on Kasaan-Goose Creek Road
 2. Decreasing time to access Emergency Medical Services
- An additional priority for improving safety risk in general is:
3. Increasing awareness of disaster preparedness plan

Plan Development

The Organized Village of Kasaan began the development of the Tribal Transportation Safety Plan with target zero in mind. Target zero meaning zero accidents, zero fatalities. The Organized Village of Kasaan has created a committee to create a comprehensive Tribal Transportation Safety Plan, under the direct supervision from the OVK Tribal Council, Tribal Administrator, Tribal Transportation Director. This committee consists of OVK Transportation Director and Assistant, City Officials and residents from two different communities on Prince of Wales Island in Southeast Alaska. The City/Village of Kasaan is a very unique community in southeast Alaska. It has 60 year around residents and an average of 8 additional people commute to Kasaan for employment on a daily basis. This remote town has kept its customary traditional and strong cultural believes alive, and has taken pride preserving their culture and history. Thorne Bay is the closest community to Kasaan by road on (POW). Thorne Bay was once known as the world's largest logging camp. The city of Thorne Bay is one of the largest cities in Alaska if measured by land acres. Thorne Bay consist of two spread out locations. One half is the main city where the local school, US Forest Service offices and compound, and stores are located. The other half of the City of Thorne Bay resides on a stretch of land on the out skirts of town known as South Thorne, where half the community commutes across the Kasaan Goose Creek access road every day.

Kasaan -Goose Creek Road

OVK's highest priority is improving the existing access road to more acceptable conditions.

OVK's Transportation Director and Assistant held a meeting at the Thorne Bay City Hall. Since Kasaan shares 17.2 miles of single lane road with the City of Thorne Bay, we created a committee to work together in documenting the most hazardous spots along this route. In rural Alaska we have little to no crash data.

Although initial research of official crash reports suggested there is on average one reported accident a year on the Kasaan to Goose Creek access road the community is aware of many more incidents that have not been officially reported. These numbers were proven to be way off. With the help of the City of Thorne Bay's Public Works Director, OVK Transportation Director, and Tracy Vaughn tow truck operator, we created a map (enclosed at the end of this document) showing the accidents that we have been involved in helping or assisting people in over the last ten years. These new numbers suggest that there are 14 accidents a year on this 17.2-mile stretch of roadway. Most accidents happen in the same locations every year.

The most problematic locations are:

- Curve at MP 1.5 where vehicles frequently leave the roadway (approx. 5 crashes in 5 years)
- Power pole at mile point 3.2 where one fatal collision has occurred
- Curves at MP 3, 5, 7 where improvements should be made so that crashes don't migrate to these locations after the curve at MP 1.5 is improved.

Now that we recognize the problem we came up with a few low cost countermeasures until we can get funding to reconstruct the whole road. Increasing the number of speed limit signs and adding signage on the horizontal and inner curves, such as chevrons to help illuminate the sharp curves at night, chevrons can help prevent traffic accidents by 15-30 percent depending on the location. Also please see the Safety Road Audit enclosed herein conducted in August 2010.

Prince of Wales Island (POW) is the third largest island in the United States. We are very different than most communities across Southeast Alaska. Due to the high volume of natural resources such as timber here on (POW) we have a high volume of road miles. However most the roads on (POW) were constructed for the transportation of logs/timber harvest. This left communities like Kasaan and Thorne Bay with substandard roads. These single lane roads with turn outs weren't built for the amount of pedestrian traffic and commercial traffic it has today. With the increase of bad weather, high volumes of rain, the inadequate drainage, shoulders, and road way alignment, we have a serious task ahead of us to help decrease the amount of deaths and serious accidents along the Kasaan to Goose Creek access road.

The road surface is granular, and traffic volume was estimated at about 350 vehicles a day. The road exhibits considerable washboards and numerous potholes. The roadway alignment is extremely curvilinear horizontally with some variation in vertical alignment as well. Traveled way width varies from 15-30 feet throughout the length. However this road is driven as single lane throughout by motorist, except when meeting another vehicle. Surrounding terrain is mostly estuary and floodplains, with some mountainous or steep side slopes. A large power line extends along the length of the roadway, with some poles near the traveled way. Beam guardrails are installed in several locations to shield roadside hazards and four bridges. Most of the guardrails are in poor condition, and the terminal sections are not of current design. In addition many side hazards, such as high fills and steep slopes are not shielded. Conversely, a few guardrail installations don't appear to be warranted when comparing the side hazard being shielded with the potential hazards presented by the guardrail (from both the rail and reduced roadway width at installation locations).

Decrease time to access Emergency Medical Services

Small communities across Alaska have another big issue when it comes to transportation safety. Since most communities are without full time medical staff or medical facility, what to do in emergency situation is vital. Seconds saved can mean the difference between a life or death situation. The time it might take you to drive to the nearest clinic or medical facility on (POW) is devastating, as much as 2 1/2 hours weather permitting. Most

communities have another means of emergency evacuation when it comes to medical issues. The appropriate landing pad for a medevac coast guard helicopter in a rural location can provide the rescue efforts with the appropriate lighting and safe landing distances in poor weather applications. It also creates a planned emergency route for the EMS and life flight crews. Kasaan is one of the few communities on (POW) that doesn't have a safe place to life flight out its residents. In the past 5 years roughly, estimated 16 serious injuries have occurred that have required medical attention not available in Kasaan. Those people had to endure a bumpy 23-mile car ride to Klawock to be flown to emergency services. When major accidents take place in remote locations such as Kasaan, and every other rural community across the U.S. the residents depend on some sort of air support to get them to the closest medical facility. The Committee would like to make it a priority to come up with a financial solution to resolve this issue. We have the location where the Safety Officer would like to have this helipad constructed just need sufficient funds to construct

Disaster Preparedness Plan

The City of Kasaan has created an emergency evacuation plan. With the OVK Tribal Councils approval they designated the Tribal Transportation Facility as their emergency evacuation facility. In order to increase public awareness of the location of this facility, the committee would like to incorporate signage to outline the most efficient route to the emergency evacuation facility.

The OVK Administrator met with the Tribal Council and Mayor of Kasaan together they recognized a few of places where they are lacking in safety. Without a highlighted emergency evacuation route for the community and residents of Kasaan and Prince of Wales they are concerned people might not be aware of the location of there emergency evacuation facility. Signage would be a simple solution to help bring awareness to the evacuation route and facility.

Participation in Developing Tribal Transportation Safety Plan (TTSP)

Organized Village of Kasaan

Paula Peterson

Kasey Smith

Sara Yockey

City of Kasaan

Skip Escoffon

Zack West

Tribal Administrator

Tribal Transportation Director

Tribal Transportation Assistant

City Mayor

City VPSO

City of Thorne Bay

Wayne Bernier

Max Blair

Terry Fiebel

Tracy Vaughn

Ben Mank

Chief Eli

Tribal Council

Existing efforts

City Mayor

City Parks and rec

Assistant

Owner operator

Alaska State Trooper

Craig police Dept

Kasaan

The Organized Village of Kasaan number one priority is the reconstruction of the Kasaan to Goose Creek access road. In order to achieve target zero status, reconstruction must take place. With the newly added signage and a new formed committee we can only keep moving forward on creating a safer roadway. We achieve more working together towards the same objectives. We are excited to work with this committee made up of OVK, City of Kasaan and the City of Thorne Bay in the future to continue to improve safety on our local roads. With the change in weather and the environment, this committee will be obligated to update the City of Kasaan emergency situation stations to appropriate standards. We understand in order to achieve target zero will have to continue our efforts forever more.

INFORMATION	2012	2013	2014
MVA	45	31	42
INJURIES	6	11	2
NON-INJURIES	39	20	40
0001-1200	19	13	19
1201-2400	26	18	23

10/13/2014

This information was obtained from Crime Star by doing a CFS search of Motor Vehicle Accidents for the above years.

Kathy Kelley

Dispatcher

KASAAN ROAD ACCIDENT PICTURES



Kasaan side of Tolstoi, approximately 10 mi



5 mile, Thorne Bay side of Southside Subdivision turn off



Bottom of Killer Hill, approximately 10.5 mile



2 mile corner



3.5 mile



4 mile by big rock in road



D1 pile at our rock pit, approximately 16 mile



1.5 mile corner



1.5 mile corner



1.5 mile corner



1.5 mile corner



1.5 mile corner



5 mile Thorne Bay side of Southside Subdivision turn off



5 mile



Killer Hill



Killer Hill 10.5 mile



2 mile corner









2006 PRINCE OF WALES SAFETY AUDIT



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
ALASKA DIVISION
709 West Ninth Street, Room 851
P.O. Box 21648
Juneau, Alaska 99802
907-586-7418 | 907-586-7420 FAX

June 23, 2006

REFER TO
HDA-AK

File #: Safety 2-2 Safety Audits

Malcolm A. Menzies, P. E., L. S.
Director, Southeast Region
Alaska Department of Transportation
and Public Facilities
P.O. Box 112506
Juneau, AK 99811-2506

SUBJECT: Prince of Wales Safety Audit

Dear Mr. Menzies:

A Safety Audit Review (SAR) of two corridors on Prince of Wales Island was conducted during the week of April 17th, 2006. The SAR team consisted of representatives from the Federal Highway Administration - Alaska Division and Western Federal Lands Highway Division, Alaska Department of Transportation and Public Facilities, Craig Community, Alaska Tribal Technical Assistance Program, Village of Kasaan and Thorne Bay Maintenance. The Kasaan road and the Hydaburg road were the subjects of this review. The Safety Audit Review Report is enclosed for your information.

For more information, please contact Al Fletcher, Safety / Operations Engineer, of our office at 907-586-7245.

Sincerely,

Karen A. Schmidt
Deputy Division Administrator

Enclosure

cc: Gary R. Hogins, P.E., Preconstruction Engineer, AKDOT&PF Southeast Region
Carolyn H. Morehouse, Safety Engineer, AKDOT&PF Southeast Region
David Hawes, Planning, AKDOT&PF Southeast Region



Prince of Wales Safety Audit Review April 2006

Background:

In response to concerns from community members on Prince of Wales (POW) Island, a Road Safety Audit Review (RSAR) team was assembled to conduct a review. Typically, spot locations with a large number of accidents or roadway corridors with accident rates higher than state wide averages for similar facilities are the primary focus. A preliminary data review failed to identify any high accident locations on POW Island, but did indicate a crash rate of 4.0 for the first four miles of the Kasaan Road. The team decided to expand the review to include the full length (17 miles) of Kasaan Road and a second corridor, identified by local representatives based on actual and anecdotal accident histories. Thus, the Kasaan and Hydaburg roads were the subjects of this review.

Purpose:

The purpose of a RSAR is to identify safety issues on selected roadway segments and/or intersections. Typical elements considered include roadside features, pavement condition, pavement markings, unpaved roadway condition, signage, delineation, intersections, approaches and special road users.

Method:

The Safety Audit team met for a briefing at Craig Community Center April 20th to discuss review procedures and emphasis areas. Meetings to identify local concerns and potential areas of interest were held with community members in Thorne Bay and Kasaan on April 18th a community meeting was held in Hydaburg on April 19th.

The team assembled in two vehicles after the meeting in Thorne Bay to drive the Kasaan corridor. The meeting in Kasaan was conducted after the initial drive through. On the following day the team used two vehicles during the review of the Hydaburg corridor. The community meeting was held the day after the initial review of the corridor.

Participants:

Al Fletcher	FHWA
Carolyn Morehouse	AKDOT&PF
David Hawes	AKDOT&PF
Shawn Alexander	AKDOT&PF
Sam Thomas	Craig Community Association
Dan Moreno	Eastern Washington University

Kyle Kitchel
Mike Harper
Lance Twitchell

Federal Lands
Thorne Bay Maintenance (Kasaan Review)
Village of Kasaan (Kasaan review)

Meeting Observations:

The Thorne bay and Kasaan meetings primary concerns were road surface, winter maintenance, and geometrics.

The Hydaburg community member's concerns were centered on road structure, winter maintenance and geometrics.

Location: Kasaan Road

Date: 4-18-2006

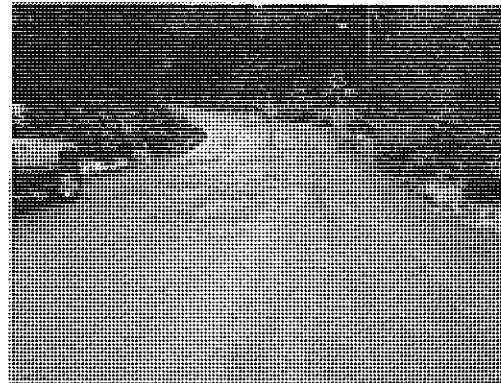
Facility/Location: Intersection of Thorne bay Road to Kasaan.

The Kasaan road is a low volume rural road that is approximately 17 miles in length. Traffic volume is under 400 vehicles per day. The road consists of four different segments. The segments vary from two lane two way sections to one lane sections with pullouts.

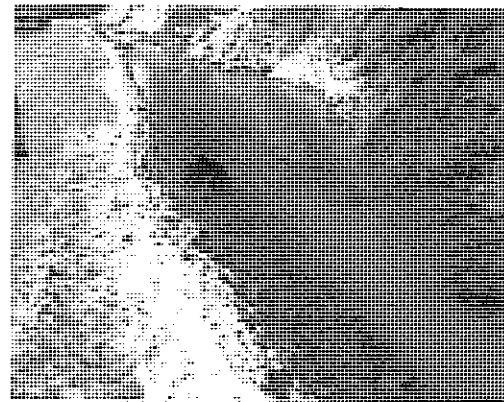
Observations:

There were several sections of the roadway that had numerous potholes.

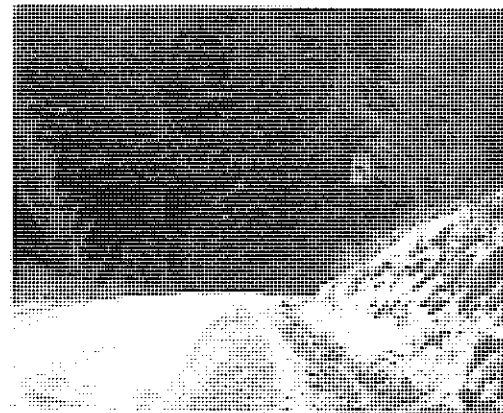
The water runoff from this approach road was directed onto the Kasaan road.



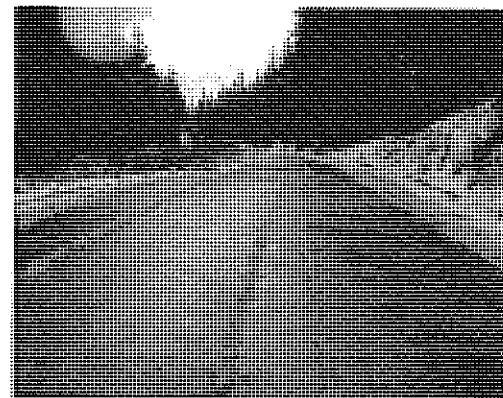
Culvert end damaged and plugged.



Advance curve warning signs were missing or were inappropriate. The example shows a left curve sign located in advance of a right curve.



Speed limit signs were missing and/or not appropriately located.



Guardrail damaged and did not have bridge transitions.



The Kasaan road is an unpaved road with no delineation. The photo at right is a crest left curve that goes into a sharp right curve. There is no advance warning for the sharp curve.



Recommendations:

Short term recommendations for the Kasaan road:

- Install speed limit signs in accordance with the Alaska ATM.
- Install advance warning signs on problematic curves.
- Install delineators where additional guidance would be beneficial.
- Both Thorne Bay and Kasaan should develop a prioritized maintenance schedule to address the Kasaan road.
- Identify and repair poor drainage locations.
- Repair damaged culverts
- Identify problematic areas during winter events for targeted maintenance efforts.
- Repair damaged bridge approach guide rails
- Increase speed enforcement efforts.
- Target enforcement for DUI offenders
- Evaluate corridor to determine locations where guardrail is warranted

Long term recommendations:

- Upgrade the entire length of the roadway to a uniform section.
- Replace bridges with permanent two lane structures, and evaluate for new alignment
- Flatten problematic crest vertical curves.

Location: Hydaburg Road**Date: 4-19-2006****Facility/Location:** Intersection of Klawock to Hollis Highway, to Hydaburg.

The Hydaburg road is a low volume rural road that is approximately 23 miles in length. Traffic volume is under 400 vehicles per day. The road is a bitumen surface treated (BST) section with 20 foot top. Most of the corridor is posted at 35 miles per hour, with the section closest to Hydaburg posted at 30 miles per hour.

Observations:

The Hydaburg road meets or exceeds the minimum design requirements for a low volume road. The surface condition, signing, pavement markings and roadside features were in good condition.

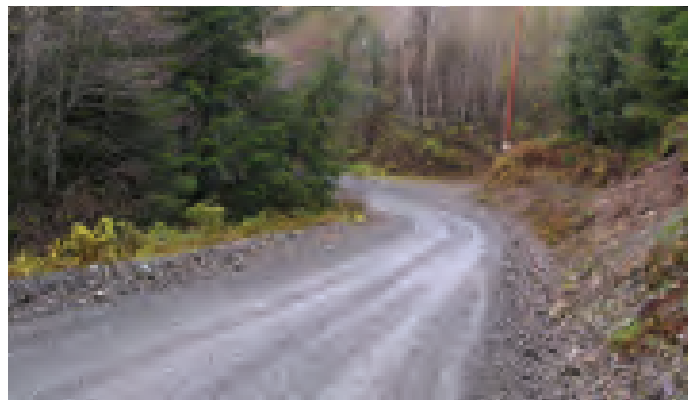
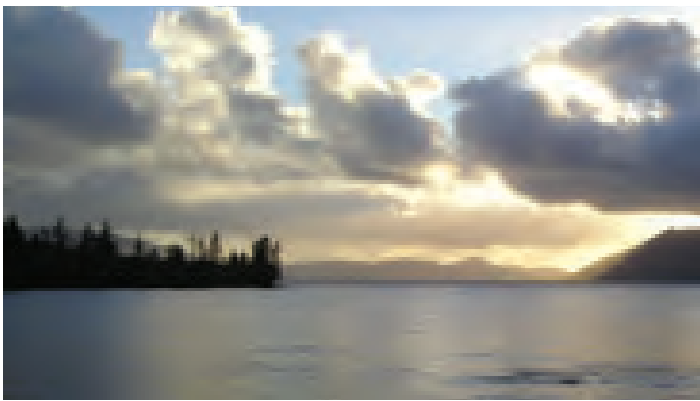
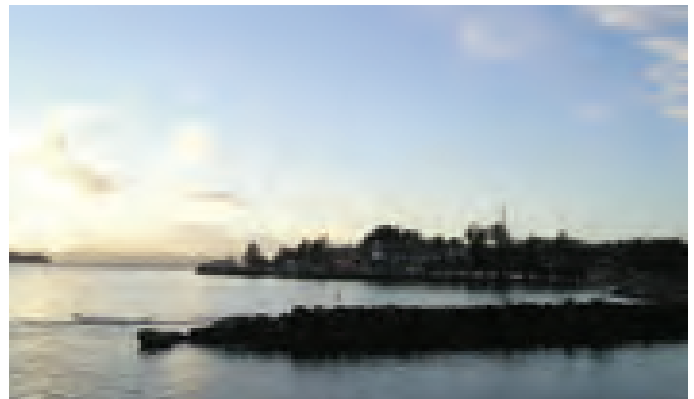
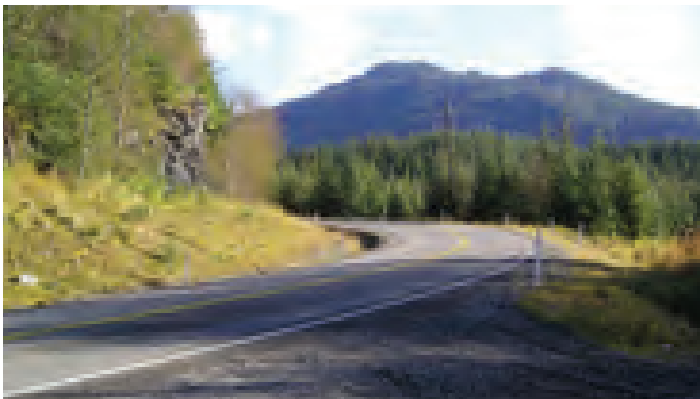
The discussion at the meeting covered numerous community concerns. Some of the concerns can not be resolved through roadway improvements. A majority of the concerns were related to driver behavior. To address these concerns the following actions are recommended:

- Install delineators on curves
- Increase speed enforcement
- Target DUI offenders
- Follow-up coordination with the community by Southeast Planning

2010 ROAD SAFETY AUDIT FOR PRINCE OF WALES ISLAND

Road Safety Audit for Prince of Wales Island, Alaska

October 25-27, 2010



IOWA STATE UNIVERSITY
Institute for Transportation

Sponsored by
Federal Highway Administration
Road Safety Audit
Peer-to-Peer Program

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As a state, local, or tribal road owner considers the use of Road Safety Audits (RSAs), technical or procedural questions often arise. To provide assistance, the Federal Highway Administration (FHWA) Office of Safety established a Peer-to-Peer (P2P) program. RSA experts serve as peers and provide guidance to agencies requesting assistance. Assistance can range from phone consultations to onsite participation in an RSA.

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ROAD SAFETY AUDIT FOR PRINCE OF WALES ISLAND, ALASKA

October 25-27, 2010

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ACKNOWLEDGMENTS

The author would like to thank the Federal Highway Administration (FHWA) Road Safety Audit (RSA) Peer-to-Peer (P2P) Program for sponsoring this safety audit. The author also thanks the Bureau of Indian Affairs, the Alaska Tribal Technical Assistance Program (TTAP), and the Organized Village of Kasaan, particularly Edward K. “Sam” Thomas, Jr. for requesting and participating in the audit activities. Also Sgt. John Brown of the Alaska State Troopers provided valuable information and insight into crash experience on the two reviewed road sections.

The participation and contribution of these members of the RSA team were invaluable in the successful completion of this activity:

- Sam Thomas, Organized Village of Kasaan
- Tom Llanos, Bureau of Indian Affairs
- Bryon Bluehorse, Alaska TTAP
- Dennis Nickerson, Klawock Community Association
- Tom McDonald, Iowa Local Technical Assistance Program (LTAP)

Crash and traffic data were provided by the Alaska Department of Transportation (DOT).

INTRODUCTION

On August 17, 2010, Tom McDonald, a member of the Iowa Local Technical Assistance Program (LTAP) and the Federal Highway Administration (FHWA) Road Safety Audit (RSA) Peer-to-Peer (P2P) Program, was contacted by Ms. Heather Rigdon, Science Applications International Corporation (SAIC), on behalf of the FHWA regarding interest in conducting one or more RSAs for selected roads on Prince of Wales Island, Alaska. The request for these services originated from Mr. Sam Thomas, transportation and infrastructure specialist for the Organized Village of Kasaan on Prince of Wales Island.

McDonald agreed and traveled to the site October 24th through October 30th, 2010 to lead an audit team in this activity. The following road sections were reviewed by a team invited by Mr. Thomas:

- Kasaan Road
- Hydaburg Highway

KASAAN ROAD

General Observations

In response to a safety concern by local citizens, a safety audit was conducted on this roadway. Observers for a general field review on October 25, 2010 were Sam Thomas, Organized Village of Kasaan; Tom Llanos, Bureau of Indian Affairs; and Tom McDonald, Iowa LTAP. Weather was partly cloudy with temperatures in the 50s.

Kasaan Road extends from the Village of Kasaan, population approximately 60, to Forest Highway 22 on Prince of Wales Island. The road is the sole access for this community and adjacent property. The nearest community is Thorne Bay, population approximately 560.

Length of the reviewed section is 17.2 miles, the surface is granular, and traffic volume was estimated at about 350 vehicles per day. According to Sam Thomas, the right of way width varies from about 120-200 ft, depending on the jurisdiction in control. The roadway alignment is extremely curvilinear horizontally with some variation in vertical alignment as well. Traveled-way width varies from about 15-30 ft throughout the length. However, the road is driven as single lane throughout by motorists, except when meeting another vehicle. Surrounding terrain is mostly estuary and floodplain, with some mountainous or steep side slopes.

The road surface exhibits considerable washboarding and numerous potholes, despite apparent frequent motor patrol blading. Posted speed is 20 miles per hour (mph) overall with some sections posted at 10 mph and one section posted at 30 mph. A large power line extends along the length of the roadway, with some poles very near the traveled way. Milepost markings are

painted on some of the poles. General information guide signing would be beneficial for the general public as well as government staff.

Beam guardrails are installed in several locations to shield roadside hazards and four bridges. Most of the guardrail is not in good condition, and the terminal sections are not of current design. In addition, many side hazards, such as high fills and steep slopes are not shielded. Conversely, a few guardrail installations don't appear to be warranted when comparing the side hazard being shielded with the potential hazard presented by the guardrail (from both the rail and the reduced roadway width at installation locations).

Some warning signs are in place to advise of hazards, but many are in need of maintenance or replacement. Additional signing is needed in many locations. All signing should be updated to comply with the 2009 edition of the *Manual on Uniform Traffic Control Devices* (MUTCD).

Drainage under the roadway is conveyed by corrugated metal pipes, mostly 30-36 in. in diameter. Condition is unknown.

Sam Thomas advised that a preliminary design for improving the roadway is being conducted by a consultant. The improvement would propose a reconstruction to provide a wider roadway with improved alignment and possibly paving. Scheduling is dependent on the availability of funding. The safety audit will address low-cost improvements that could address several potential hazards along the alignment.

Detailed Daylight Review

On October 26th, a detailed review of Kasaan Road was conducted. Observers were Sam Thomas; Byron Bluehorse, Alaska Tribal Technical Assistance Program (TTAP); Dennis Nickerson, Klawock Community Association; Tom Llanos; and Tom McDonald. The weather was overcast with light rain and the temperature was in the 40s.

The review began at the southerly terminus, in the village of Kasaan, at approximate odometer reading 1189.1 and proceeded northerly.

Odometer reading 1189.5

A walkway is in place on the side and several vehicles and boat trailers were parked along both sides of the roadway, presumably by "fishermen" in adjacent Kasaan Bay. A Slow Children warning sign is in place for southbound traffic.

Odometer 1189.6

Beam guardrail is in place shielding a side hazard, although this installation should be reviewed for removal due to apparent minimal need. Two fire hydrants were also observed in this area without shielding.

Odometer 1189.7

Roadway top width was measured at about 33 ft, which is common throughout this area.

Odometer 1189.8

Beam guardrail installed on both sides, damaged in one location. Available traveled-way width is reduced to 24 ft between the installations.

Odometer 1190.2

Side road intersects with Kasaan Road from the left.

Odometer 1190.4

30 mph regulatory sign posted for northbound traffic, but sign is damaged. Road top width measured 23 ft in this location.

Odometer 1190.5

Slow Residential Area sign for southbound traffic, should be reviewed for replacement.

Odometer 1190.6

Beam guardrail installations on both sides, should be reviewed for need.

Odometer 1191.8

Beam guardrail on left side only, should be reviewed for replacement.

Odometer 1192.4

Beam guardrail installations on both sides, should be reviewed for need. All guardrail installations in this area significantly reduce available travel width for drivers.

Odometer 1192.8

Beam guardrail in place to shield high fill (10-12 ft).

Odometer 1193.5

Road Narrows sign for northbound traffic.

Odometer 1193.6

10 mph regulatory sign for northbound traffic, 30 mph regulatory sign for southbound traffic, steep slopes with no shielding.

Odometer 1193.7

Narrow-width (13.5 ft) bridge, Stop sign for southbound traffic, sign missing for northbound. No other warning signs are in place for this single-lane structure or for northbound roadway. Signing should be upgraded and guardrail replaced, one section has been impacted. Side-road approach from the right, no Stop sign. 17 ft wide measured roadway top width.

Odometer 1194.0

Turnout on right, should be reviewed for proper design standards.

Odometer 1194.4

Turnout on right, review for design-standard compliance.

Odometer 1194.5

Beam guardrail on both sides, damaged terminal section on the northbound side (right).
Guardrail on right side should be reviewed for need.

Odometer 1194.8

Beam guardrail on left side only (southbound).

Odometer 1194.9

Turn out on left for southbound traffic.

Odometer 1194.95

Turnouts on right and left sides.

Odometer 1195.0

Measured 18 ft wide roadway top width.

Odometer 1195.1

Down grade to sharp left curve, no warning signs in place. Should be reviewed for turnout need.

Odometer 1195.15

Narrow (13.8 ft wide) bridge with beam guardrail shielding approaches. Damaged terminal on right side (northbound). Bridge has steel deck. One-lane bridge warning sign northbound (orange sheeting). Signing and guardrail should be updated.

Odometer 1195.2

Missing sign for northbound traffic. Side-road approach from left between bridges.

Odometer 1195.25

Narrow (13.8 ft wide) bridge with damaged beam guardrail terminals. Guardrail does not connect to bridge.

Odometer 1195.3

One Lane Road with Turnouts warning sign for northbound traffic.

Odometer 1195.35

Regulatory 10 mph speed limit sign for southbound traffic. One Lane Bridge sign down in ditch. Occasional large, 2 ft diameter rock on edge of roadway and occasional large tree near roadway.

Odometer 1195.9

Tolstoi Bay on right; jurisdiction change from Kasaan to Thorne Bay.

Odometer 1196.0

Regulatory 10 mph speed sign southbound. Regulatory 20 mph speed sign northbound, badly shot up. Beam guardrail on right, northbound, review for replacement. 15 ft wide measured roadway top width.

Odometer 1196.3

Entrance to Tolstoi Bay Seaport on right. Measured roadway top width 20 ft, turnout needed.

Odometer 1196.6

Logging road approach from left.

Odometer 1196.7

One Lane Road with Turnouts sign for northbound traffic.

Odometer 1196.9

Measured roadway top width of 21 ft.

Odometer 1197.0

One Lane Road with Turnouts sign for southbound traffic (shot up).

Odometer 1197.2

Steep foreslopes on both sides, no guardrail in place.

Odometer 1197.4

One Lane Road with Turnouts, 26 in. size for northbound traffic.

Odometer 1197.8

One Lane Road with Turnouts for southbound traffic (shot-up), 24 in. size with high intensity sheeting. Side road approach from right.

Odometer 1197.9

Side road connection from the right side.

Odometer 1198.0

24 ft wide bridge with beam guardrail, Thrie beam through bridge, no warning signs or turnouts.

Odometer 1198.1

Logging road (gated), entrance from right.

Odometer 1198.7

Measured 25 ft wide roadway top width.

Odometer 1198.9

Steep side slopes on both sides, no guardrail. Should be reviewed for need of shielding.

Odometer 1199.3

Logging road connection from the right.

Odometer 1199.6

Steep side slopes on both sides at creek crossing, no guardrail. Should be reviewed for shielding needs. Measured roadway top width 25 ft.

Odometer 1199.9

One Lane Road with Turnouts warning sign, badly tipped, for northbound traffic.

Odometer 1200.1

Turnout on left side.

Odometer 1200.2

Beaver pond on right side with steep slope, no guardrail. Should be reviewed for shielding. Measured roadway top width 18 ft.

Odometer 1200.25

Turnout on the right side, review for compliance with design standards.

Odometer 1200.3

One Lane Road with Turnouts (shot) for southbound traffic.

Odometer 1200.8

Steep slopes both sides with no guardrail; site of recent property damage only (PDO) crash.

Odometer 1200.9

One Lane Road with Turnouts sign for northbound traffic, installed on backslope.

Odometer 1201.1

Power pole near roadway on right side.

Odometer 1201.2

Turnout on right side, possibly need shielding in this area.

Odometer 1201.3

Turnouts on left and right sides, review for design-standard compliance.

Odometer 1201.4

20 mph regulatory sign for southbound traffic.

Odometer 1201.5

One Lane Road with Turnouts sign for northbound traffic.

Odometer 1201.55

Side road connection from right, Ron's Road, with Stop sign.

Odometer 1201.6

20 mph regulatory sign for northbound traffic, badly worn and tipped.

Odometer 1201.65

15 mph curve advisory plaque installed without a warning sign. Posted No Shooting hunting sign mounted below on same support.

Odometer 1201.7

Power pole near roadway on right side. Steep slope on right side with no guardrail. Should be reviewed for need of shielding.

Odometer 1201.8

Several power poles near roadway on right side.

Odometer 1201.9

Turnout on right side, measured 18 ft wide roadway top width.

Odometer 1202.0

Steep slope on right side, no guardrail.

Odometer 1202.1

Turnout on right side. Steep slope on right with no guardrail. Should be reviewed for need of shielding and standard-designed turnout.

Odometer 1202.2 to Odometer 1202.5

Steep slopes on right side at three locations, no guardrail.

Odometer 1202.6

Need standard-designed turnouts on each side.

Odometer 1202.7

Steep slope on right side with no guardrail. Should be reviewed for need of shielding.

Odometer 1202.8

Large boulder in middle of road. Steep slope on right side extends to odometer 1202.9.

Odometer 1203.4

Steep slope on right side extends to odometer 1203.8, should be reviewed for shielding and need for standard-designed turnout. Measured 19 ft width roadway top width.

Odometer 1203.7-1203.8

Should be studied for need of shielding on right side for steep slopes.

Odometer 1203.9

Turnouts on both left and right sides, review for standard design compliance.

Odometer 1204.3

Rock cut on both sides. Intermittent steep slopes on right side just beyond. Need standard-designed turnouts in this area.

Odometer 1204.6

20 mph regulatory sign for northbound traffic.

Odometer 1204.9

Steep slope in curve on right side. 15 mph curve advisory plaque for southbound traffic, mounted alone.

Odometer 1205.0

Turnouts on both sides, review for standard design compliance.

Odometer 1205.4

Steep slope on right side in curve, review for need of shielding.

Odometer 1205.6

Truck Crossing warning sign, badly worn and tipped, for northbound traffic. Measured 23 ft roadway top width.

Odometer 1205.8

Steep slope to lake on right side, no guardrail. Study for need of shielding.

Odometer 1205.95

Study for need of standard-designed turnout.

Odometer 1206.2

Saw mill entrance on right.

Odometer 1206.4

Entrance to Thorne Bay Solid Waste site on right side. Measured 25 ft wide roadway top width.

Odometer 1206.5

Entrances to saw mill facilities on both sides.

Odometer 1206.6

Another saw mill on right side.

Odometer 1206.7

Intersection of Ellen Lake Road from left side. Yield sign for Kasaan Road traffic.

Odometer 1206.8

Power poles near roadway on left side.

Odometer 1207.1

Intersection with Thorne Bay Road (Forest Highway 20). Paved approach on Kasaan Road with single Stop sign.

(End of reviewed route)

HYDABURG HIGHWAY

General Observations

In response to safety concerns expressed by local residents, an RSA was conducted on this roadway October 27, 2010. Weather was partly cloudy and cool, with highs in the low 40s. Traffic was light on the day of the review. Observers were Sam Thomas, Thomas Llanos, Byron Bluehorse, and Tom McDonald.

Hydaburg Highway extends from the community of Hydaburg to Klawock/Hollis Highway and is the main access for the town, population approximately 500. The roadway is owned and maintained by the Alaska Department of Transportation (DOT) and is paved with a seal coat surface. Length of the reviewed section is about 22.9 miles.

The posted regulatory speed limit is 35 mph. According to 2009 Alaska DOT data, traffic volumes vary from 88 to 145 vehicles per day. Pavement condition was good with some distortion and very scattered potholes. Some evidence of subbase distress was observed and warning signs have been installed noting Dip or Dips. Centerline and edge line pavement markings appear in satisfactory condition in daylight conditions.

Due to the curvilinear alignment of the roadway, both horizontally and vertically, passing opportunities are limited in most areas. Road elevation varies from floodplain to mountainside.

Signs also appear in good condition and substantial compliance with the 2003 MUTCD. Delineators have been installed along the roadway through numerous, but not all, horizontal curves to provide guidance for nighttime travel. Spacing of these delineators varies at each location.

Beam guardrail is installed in several locations to shield potential hazards at high fills and at bridge approaches. Guardrail terminals are not of current design, but installations are connected to bridges. Bridges are all shoulder-width. Right-of-way appears open and wide in most areas, with a 20-30 ft area cleared of trees and brush adjacent to the shoulders.

Milepost markers are in place at one-mile intervals along the right side of the roadway. A power line extends along the roadway with poles primarily located near the right-of-way line.

Detailed Daylight Review

A detailed review began at Cedar Street Extension in Hydaburg and proceeded northerly.

Odometer 58.3

The Hydaburg Highway terminates at this location with a T intersection. No Double Arrow sign is in place across from the T.

Odometer 58.4

Stop Ahead sign and plaque for southbound traffic.

Odometer 58.5

Quarry Loop Road intersects from the left with a T intersection. No Double Arrow sign is in place across from the approach. Measured roadway width was 20 ft wide pavement with 2-4 ft granular shoulders.

Odometer 58.6

A guide sign with destinations, Deer warning sign, and 35 mph regulatory speed sign are in place for northbound traffic. A Hydaburg guide sign was in place for southbound traffic.

Odometer 58.8

A granular-surfaced road intersects from the left. A bridge over the Hydaburg River with beam guardrail was measured with a 27 ft wide deck. Bridge has no object markers at the corners and guardrail has minimal delineation. Should be reviewed for warning sign needs.

Odometer 59.2

Miijuu Way intersects from the left side. This is a T intersection with no Double Arrow or safety ramp across from the side road approach. A No Littering sign is in place for northbound traffic.

Odometer 59.3

A Buckle Up sign is in place for northbound traffic.

Odometer 59.5

A Dips warning sign is in place for northbound traffic, but with orange background sheeting. Pavement markings appear newly-placed, but with minimal beads for retroreflectivity.

Odometer 61.4

Beam guardrail is in place on both sides shielding steep slopes and high fills. Roadway exhibits a steady down grade to the north.

Odometer 61.8

35 mph regulatory speed signs are in place on both sides of roadway.

Odometer 61.9

Bridge with measured 27 ft wide deck and beam guardrail at approaches. No object markers and minimal delineation were in place. A double-yellow, no-passing zone was in place, but with no apparent sight restrictions, at least northbound. Should be reviewed for warning sign needs.

Odometer 62.6

Horizontal S curves with no delineators installed.

Odometer 62.7 to 62.8

Beam guardrail in place on left side, shielding steep slope to bay. Some sections may need replacement. Standard turnout may need rehabilitation.

Odometer 63.0

A granular-surfaced trail or spur road intersects from the right.

Odometer 63.2

A Dips warning sign is in place for southbound traffic.

Odometer 63.6

A shoulder-width (27 ft) bridge with beam guardrail at the approaches. No object markers are in place at the corners and minimal delineation has been placed with the guardrail. Should be reviewed for warning sign needs.

Odometer 63.8

A Dips sign is in place for southbound traffic.

Odometer 64.1 to 64.3

Beam guardrail is in place on the left, shielding a slope to the bay.

Odometer 64.5

A horizontal curve sign with delineators installed, but many horizontal curves do not have warning signs in advance. May need warning sign to reduce speed.

Odometer 65.0

Natzuhini River Bridge, shoulder-width with beam guardrail at the approaches, but no object markers at the bridge corners and minimal delineation with the guardrail. Several intersecting side roads to adjacent staging area and camp.

Odometer 65.1

Horizontal curve with no delineators or advance warning signs.

Odometer 65.3

Horizontal curve with delineators but no advance warning signs. A logging camp is located on the right side.

Odometer 65.4

35 mph regulatory signs in place on both sides of roadway.

Odometer 65.5

A Reverse Turn sign with 25 mph advisory speed plaque mounted on a breakaway support is in place for northbound traffic. Sign is in good condition with apparent high-intensity sheeting. Roadway is on an up grade northbound at this point. Curves in this area have delineators installed throughout.

Odometer 65.6

A Reverse Turn sign with 25 mph advisory speed plaque on a breakaway support is in place for southbound traffic. Sign is tipped, which may hamper nighttime visibility.

Odometer 65.8

Reverse curves with delineators. A northbound Reverse Curve warning sign with a 30 mph advisory speed plaque was in the ditch.

Odometer 66.0

A Curve warning sign with 25 mph advisory speed plaque in place for northbound traffic. A steep foreslope is located on the left side with no guardrail shielding. Delineators are in place through the horizontal curve. A Curve sign is missing, but 30 mph advisory speed plaque is in place for southbound traffic.

Odometer 66.2

Standard turnout may need rehabilitation.

Odometer 66.3

Soda Bay Road intersects from the left. Visibility to intersection is limited. Steep embankments on both sides in this area with no shielding. Need for guardrail should be reviewed.

Odometer 66.5

Horizontal curve with delineators in place, but no curve warning signs were observed.

Odometer 66.7

Horizontal curve with no delineators.

Odometer 66.9

Reverse Curve warning sign with a 25 mph advisory speed plaque on a breakaway support is in place for northbound traffic. The curves have delineators throughout, although several are damaged. Standard turnout in area should be reviewed for rehabilitation needs.

Odometer 67.1

Review left side for shielding needs.

Odometer 67.4

A Reverse Curve warning sign with 25 mph advisory speed plaque with a perforated steel support is in place for southbound traffic.

Odometer 67.6

A steep slope was observed on the left side with no guardrail shielding. Location should be reviewed for need of shielding.

Odometer 67.7

A Reverse Curve warning sign with 25 mph advisory speed plaque on a breakaway support is in place for northbound traffic. Delineators in place thorough curves.

Odometer 67.8

A Reverse Turn warning sign with 25 mph advisory speed plaque on a breakaway support is in place for southbound traffic, although sign is tipped. Steep embankment in this area, should be reviewed for shielding need.

Odometer 68.0

Curve delineators end.

Odometer 68.2

Study both sides for shielding needs along steep slopes.

Odometer 68.3

Pond on left, possible beaver activity.

Odometer 68.4

Several horizontal curves without delineators. Granular-surfaced side road approaches on the left side.

Odometer 68.6

Sata Creek Bridge, shoulder-width (27 ft) deck with approach beam guardrail. No object markers are in place at the bridge corners, minimal delineation for the guardrail. Review for need of warning signs.

Odometer 68.7

Soda Trail intersects from the left and recreational sign is in very poor condition. A slash pile entrance is located on the right side. May need pedestrian crossing signing and standard turnout for vehicles.

Odometer 68.9 to 70.4

Several curves with no delineators or advance warning signs. Also another pond on left with possible beaver activity.

Odometer 70.0

A shoulder-width (27 ft) bridge with beam guardrail. No object markers are in place on the bridge corners, minimal delineation with the guardrail. Should be reviewed for warning sign needs.

Odometer 71.0

Northbound Curve warning sign with a 30 mph advisory speed sign on a breakaway support, appears to be located too close to the curve. Delineators are installed through the curve. Pond on left side near toe of slope.

Odometer 71.1

Curve warning sign with a 30 mph advisory speed plaque on a breakaway support is in place for southbound traffic. Beaver Creek Bridge, shoulder-width (27 ft) with beam guardrail. No object markers are in place at the bridge corners, single delineators mark the ends of the guardrail. Review for warning sign needs.

Odometer 71.2

Guide sign with destinations for northbound traffic, mounted on two supports with breakaway bases. 35 mph regulatory speed sign for southbound traffic is tipped.

Odometer 71.25

Granular side road intersects from the right side, with a Stop sign. A guide sign with destinations is mounted across from the T approach. Another support was observed at this location, but with no sign.

Odometer 71.3

A guide sign with destinations for southbound traffic, with gunshot damages.

Odometer 71.4

A crushed rock pile is located on the left side.

Odometer 71.45

35 mph regulatory sign for northbound traffic (shot-up).

Odometer 71.5

A Reverse Turn sign with a 25 mph advisory speed plaque on a breakaway support for northbound traffic. Delineators are mounted throughout the curves, roadway was on a down grade to the north. Need standard-designed turnout in this area?

Odometer 71.7

A steep slope is located on the left side without guardrail shielding. Ditch on right has been obstructed by rock slide.

Odometer 71.8

A Reverse Turn sign with 25 mph advisory speed plaque on a breakaway support is in place for southbound traffic. Trocadero Trail intersects on the left side. Guide sign in advance.

Odometer 72.0

A Curve warning sign with a 30 mph advisory speed plaque mounted on a perforated steel support for northbound traffic. Steep slopes should be reviewed for shielding needs.

Odometer 72.1

Bridge over Cable Creek, shoulder-width (27 ft) with beam guardrail. No object markers are in place at the corners, single delineators are installed at the guardrail ends. Review for warning sign needs. Curve delineators end at this point.

Odometer 72.4

Curve delineators start again. Steep slopes should be reviewed for shielding needs.

Odometer 72.45

A Reverse Turn sign with 25 mph advisory speed plaque mounted on breakaway support is in place for northbound traffic. Delineators are in place through the curves. A power line extends northerly beyond the beginning of curvature, possibly creating a “visual trap.”

Odometer 72.7

A Reverse Turn warning sign with 25 mph advisory speed plaque mounted on a breakaway support for southbound traffic.

Odometer 72.8

Delineators end.

Odometer 72.9

Steep slopes on both sides with no guardrail. Should be reviewed for shielding needs.

Odometer 73.1

A side road or entrance intersects on the right side.

Odometer 73.2

Delineators start for curvature, but no warning signs are in place. Steep slope on left should be reviewed for shielding needs.

Odometer 73.3

A Turn warning sign with a 25 mph advisory speed plaque mounted on a breakaway support for northbound traffic.

Odometer 73.4

A Turn warning sign with a 25 mph advisory speed plaque mounted on a breakaway support for southbound traffic.

Odometer 73.5

Delineators end.

Odometer 73.6

Horizontal curve with no delineators or warning signs. Steep slope on left should be reviewed for shielding needs.

Odometer 73.7

A Reverse Curve warning sign with 30 mph advisory speed plaque mounted on breakaway support for northbound traffic. Delineators begin.

Odometer 74.0

A Reverse Curve warning sign with 30 mph advisory speed plaque on a breakaway support for southbound traffic. Delineators end.

Odometer 74.2

35 mph regulatory speed signs mounted on both sides. Steep slope on the left with no guardrail, should be reviewed for shielding needs.

Odometer 74.4

Delineators begin. A Turn warning sign with a 25 mph advisory speed plaque on breakaway support is in place for northbound traffic.

Odometer 74.5

Gulch Creek conveyed under the roadway in a corrugated metal pipe, shielded with beam guardrail with a single delineator mounted in each end. Turnout on right side.

Odometer 74.6

A Turn warning sign with a 25 mph speed plaque mounted on a breakaway support is in place for southbound traffic. Delineators end. A granular side road intersects from the right side. No Double Arrow warning sign is in place across from the T.

Odometer 74.7

Steep slope on left side, should be reviewed for shielding need.

Odometer 74.8

A Turn warning sign with a 25 mph advisory speed plaque is mounted on a breakaway support for northbound traffic. Delineators begin and roadway is on an up grade northbound at this point.

Odometer 75.0

A Turn warning sign with 25 mph advisory speed plaque on a breakaway support is in place for southbound traffic. Delineators end.

Odometer 75.1

Horizontal curve with no delineators or advance warning signs. Steep slope on the left side with no guardrail shielding.

Odometer 75.2

35 mph regulatory speed signs mounted on both sides. Existing turnout may need rehabilitation.

Odometer 75.4

Delineators begin. Steep slope on left side with no guardrail shielding.

Odometer 75.8

New beam guardrail has been installed with current design terminals on the left side.

Odometer 75.9

Delineators end.

Odometer 76.1

Delineators begin. No curve warning signs in place for northbound traffic.

Odometer 76.2

Delineators end. No curve warning sign is in place for southbound traffic.

Odometer 76.4

Delineators begin. A Reverse Turn warning sign with 25 mph advisory speed plaque mounted on a breakaway support for northbound traffic.

Odometer 76.5

Trocadero Creek Bridge, shoulder-width (about 27 ft) with beam guardrail at the approaches. No object markers are in place at the bridge corners, a single delineator is installed at each guardrail end. Should be reviewed for warning sign needs. Creek name sign has been damaged by gunshots.

Odometer 76.6

Delineators end. A Reverse Turn sign with 25 mph advisory speed plaque on a breakaway support is in place for southbound traffic.

Odometer 76.7

Reverse curves with no delineators or advance warning signs.

Odometer 76.9

Delineators begin. A Turn sign with 25 mph advisory speed plaque mounted on a perforated steel support for northbound traffic. Sign appears to be mounted too low.

Odometer 77.0

West Fork Trocadero Creek Bridge, shoulder-width (about 27 ft) with approach-beam guardrail. No object markers at the bridge corners, single delineator is in place at each guardrail end. Should be reviewed for warning sign needs. A Turn sign with 25 mph advisory speed plaque mounted on a breakaway support is in place for southbound traffic.

Odometer 77.1 to 77.5

Horizontal curves with no delineators or advance warning signs. Occasional steep slopes with no guardrail observed on the left side. This area should be reviewed for shielding needs on both left and right sides.

Odometer 77.4

Delineators begin, but no Curve warning sign is in place for northbound traffic.

Odometer 77.5

Winding Road horizontal alignment sign (W1-5) with 25 mph advisory speed plaque is in place for southbound traffic. Measured pavement width was 20 ft with 1-2 ft wide granular shoulders.

Odometer 77.7

Delineators end.

Odometer 77.9

A logging road intersects from the left.

Odometer 78.1

Indian Creek Road intersects from the right, no Double Arrow warning sign is in place across from the T approach.

Odometer 78.3

One Duck Trail sign in place for northbound traffic. Location should be reviewed for need of pedestrian crossing signing.

Odometer 78.4

A granular-surfaced side road intersects from the left with a Stop sign in place. Curves beyond with no delineators or advance warning signs.

Odometer 78.6

One Duck Trail intersects from the right. Location should be reviewed for pedestrian crossing sign needs.

Odometer 78.8

Roadway down grade to the north with curves at bottom of hill. No delineators or advance warning signs are in place.

Odometer 78.9

One Duck Trail sign in place for southbound traffic. Side road intersection and pit exist at this location.

Odometer 79.3

End down grade for a short distance. Some steep slopes on the left side with no guardrail shielding.

Odometer 79.6

Winding Road horizontal alignment warning sign (W1-5) with 30 mph advisory speed plaque on a breakaway support is in place for northbound traffic.

Odometer 79.7

Steep slope on the left side with no guardrail shielding.

Odometer 79.9

Delineators end. Winding Road alignment warning sign with 30 mph advisory speed plaque on a breakaway support for southbound traffic.

Odometer 80.2

Fubar Creek Bridge, shoulder-width (about 27 ft) with beam guardrail extending through the bridge. No object markers are in place at the bridge corners, minimal delineation for the guardrail. Should be reviewed for warning sign needs.

Odometer 80.3

Entrance intersects from the right side. Horizontal curves beyond with no advance warning signs or delineators. Forest Service construction area for Fubar Creek, but no warning signs in place.

Odometer 80.3 to 80.6

Steep slopes observed with no guardrail shielding. Area should be reviewed for shielding needs. Roadway downgrade to the north.

Odometer 80.8

Harris River Bridge, shoulder-width (about 27 ft) with beam guardrail at approaches. No object markers at bridge corners, minimal delineation for guardrail. Should be reviewed for warning sign needs.

Odometer 81.1

A Dips warning sign for southbound traffic with orange background sheeting. Also for southbound traffic, 35 mph regulatory speed sign, \$1000 Fine for Littering sign, and Deer warning sign (shot up). A Stop Ahead warning sign (shot) for northbound traffic.

Odometer 81.2

Chevrons in place around curve for northbound traffic. Stop sign at Klawock-Hollis Highway for northbound traffic is shot up. Guide sign with destinations mounted across from the T approach, also shot several times.

(End of this reviewed section)

NIGHTTIME REVIEWS

Due to scheduling limitations, no nighttime reviews were conducted for these two audited roadways. Local authorities should conduct these observations to assess visibility of signs and markings in dark conditions and address any identified deficiencies as warranted.

LAW ENFORCEMENT OBSERVATIONS

October 27, 2010, Sam Thomas, Thomas Llanos, Byron Bluehorse, and Tom McDonald met with Sgt. John Brown of the Alaska State Patrol to visit about recent (last three years) crash history on area roads.

According to Sgt. Brown, crashes are usually quite scattered, which is common for lower-volume roads. Fatal crashes have usually involved impaired drivers and excess speed. One recent fatal crash occurred on an icy road. More crashes generally occur at night (again, perhaps influenced by impaired drivers).

Due to a small staff, the Alaska State Patrol does not conduct routine patrols on area roads to monitor speeding, etc. Speed checks are made when responding to calls and traffic crashes. Sgt. Brown usually gathers crash data at the site and then enters it in the state database with a computer in the office.

Sgt. Brown stated that milepost markers would be helpful when investigating crashes and preparing reports, and that the markers in place may not be sufficiently accurate for crash reporting. The Prince of Wales Alaska State Troopers currently use global positioning technology to locate most, if not all, of the crashes on Island roads. Sgt. Brown also suggested that improved mile markers and logging road signing would help the Patrol in locating crashes and responding to emergency calls. The general public would also be benefited by this additional signing.

For Kasaan Road, Sgt. Brown thought the most-hazardous locations were the several narrow bridges and the large rock in the middle of the road that should be removed. Some roadway lighting would be effective at locations, such as the intersections of Ron's Road, Salt Chuck Road, and South Thorne Bay Road, the waste-disposal site, and the narrow bridges. Many areas should be reviewed for regulatory speed modifications.

Major crash causes on this road are impaired driving, excess speed, nighttime visibility, road-width deficiencies, and driver error. Specific problem areas have been noted from Kasaan to Tolstoi and from Tolstoi to the waste-disposal site.

The Hydaburg Highway is very curvilinear, but the roadway markers (delineators), recently installed by the Alaska DOT, have been very effective for guidance at night. Major crash causes are impaired driving, excess speed, nighttime visibility, road surface conditions in adverse weather, and driver error. The primary areas of concern for drivers are blind corners, switch backs, and reverse curvature.

Sgt. Brown suggested lighting be considered at bridges and the intersections of Natzuhini Camp, Miijuu Way, Indian Creek Road, Fubar Creek, 12 Mile Arm, and Polk Road. Problem areas have been noted in mile 1 and mile 20, mostly due to low friction in adverse weather, because of drainage and super-elevation needs.

CRASH DATA

While crash data were not available for the specific routes reviewed, general data obtained from the Alaska DOT are listed in Table 1 for Prince of Wales Island for the years 2004 through 2007.

The data indicate a steady increase in the number of crashes reported over this four-year period for the Island. While that may not be indicative of increased crash numbers on the reviewed roads, it points toward concern for safety on the Island roads in general.

Table 1. 2004-2007 Prince of Wales Island crashes by severity

Year	PDO	Minor Injury	Major Injury	Fatal	Total
2007	31	13	0	1	45
2006	35	11	1	0	47
2005	17	13	2	0	32
2004	6	8	1	1	16
Totals	89	45	4	2	140

PDO is Property Damage Only

In addition, audit team members and the Alaska State Patrol officer advised that numerous crashes occurring on these roads annually are not reported. An effort to track crashes on Kasaan Road and Hydaburg Highway would be beneficial in determining the most effective safety mitigation. Crash data for Prince of Wales Island is included in Appendix C.

TRAFFIC VOLUME DATA

A traffic map obtained from the Alaska DOT indicated the traffic using Hydaburg Highway on a daily basis ranged from an annual average of 88 to 145 vehicles for 2009. A copy of the map is contained in Appendix B.

SUGGESTED IMPROVEMENTS

Kasaan Road

Initial action should be taken to improve safety on the roadway, concentrating on lower-cost, rapid-deployment initiatives. Subsequent to those steps, longer-range, more-costly improvements could be planned and undertaken.

Short Term

Using the 2009 MUTCD Part 2-Signs as the major reference, upgrade all signing along the reviewed section, specifically considering these improvements:

1. Install Winding Road (W1-5) horizontal alignment warning signs with a next 17 miles plaque at each end of the section and install Winding Road warning signs without a distance plaque at approximate three-mile intervals, as well.
2. Perform a speed study to determine the appropriate safe operating speed and install Speed Limit signs (R2-1) at each end and at approximate three-mile intervals, as well. Consider oversized signs (30 x 36 in.) with red flags for added emphasis.

3. Even though the road may not meet functional classification or minimum traffic-volume requirements (1,000 vehicles per day), review and consider application of the guidance presented in Section 2C.06 and Table 2C-5 of the MUTCD regarding use of appropriate horizontal alignment signing, chevrons, and advisory speed plaques, concentrating on curves where the determined advisory speed differs by 10 mph or more from the posted speed limit. Also review Table 2C-4 for proper placement of advance warning signs. Where the use of chevrons is recommended, follow the guidance in Table 2C-6 for number and spacing of these devices.
4. At the narrow bridges, install Stop signs with 24 x 18 in. regulatory (black on white) Please Alternate plaques at each of the structures. Consider use of red flags on the Stop signs for added emphasis. Be sure to install Stop Ahead warning signs in compliance with Table 2C-4 in advance of the Stop signs. Install One Lane Bridge (W5-3) warning signs at the appropriate distance in advance of these bridges.
5. Refer to the 2009 MUTCD for appropriate sizes of all signs and plaques. Consider use of fluorescent yellow background for all warning signs to enhance visibility in low-light conditions.
6. Replace all One Lane Road with Turnouts warning signing, possibly with One Lane Road (W20-4) with yellow background and Use Turnouts on plaque mounted below the warning sign. Discuss the appropriate message and design with the Alaska DOT.
7. As much as possible, mount all signs following guidance in Section 2A.16 and Figure 2A-2 of the 2009 MUTCD for height and offset from roadway.
8. Be sure that all regulatory signs (Stop, Speed Limits, etc.) are supported by appropriate jurisdiction approval for proper enforcement.
9. Enhance roadside safety and improve nighttime guidance for drivers by providing additional delineation on existing utility poles and installation of supplemental delineation or guardrail shielding adjacent to steep slopes. If accumulated snow depth warrants, consider use of devices, such as “snow poles,” which are available from vendors for that purpose.
10. Review all guardrail installations and upgrade to current design standards as needed. Consider removal of existing installations where hazards do not warrant shielding. Review noted locations for installation of additional w-beam guardrail where hazards justify shielding. Enhance nighttime guidance at guardrail locations using delineation in or behind the rails.
11. Review and upgrade all turnouts to current design standards where needed. Install additional turnouts at locations listed in the field review notes.

12. Visit with the utility company to suggest placement of Type 2M2-2V Object Markers on the large utility poles for added guidance for drivers.
13. Install accurate milepost reference signs (D10-1 and D10-2) along the route to assist law enforcement in locating crashes.
14. Remove large rock from middle of road about 4 miles south of the Forest Highway 20 intersection.

Long Term

Planning is underway for reconstruction of Kasaan Road, but major improvements could be scheduled in phases to extend funding needs over several years. The initial emphasis could be focused on replacement of obvious potential hazards. The following priorities are suggested for consideration.

1. Replace all narrow bridges, possibly with reinforced concrete box or pipe culverts to reduce future maintenance needs. Realign roadway as needed at these sites to eliminate severe curvature of approaches.
2. Study existing intersections, especially Ellen Lake Road and Ron's Road, for realignment needs and sight distance improvement. Also study current visibility to and from higher-traffic intersections, such as the Thorne Bay Solid Waste Site, for needed improvements and undertake those upgrades.
3. Reconstruct all roadway sections with a top width less than 24 ft to a minimum of 28 ft or more as design standards dictate. Realign road through those areas as well.
4. Complete reconstruction of all remaining sections to a minimum of 28 ft wide or more, as design standards dictate. Realign where needed.
5. Pave road when traffic volumes warrant and funding becomes available.

Hydaburg Highway

Short term

Safety improvements for this roadway could be accomplished with mostly low-cost measures and the following are suggested for consideration. Using the 2009 MUTCD Part 2-Signs as the major reference, update all signing along the roadway specifically considering the following.

1. Review and apply the guidance presented in Sections 2C.06, 2C.07 and Table 2C-5 of the MUTCD regarding use of appropriate horizontal alignment signing, chevrons, and advisory speed plaques, concentrating on curves where the determined advisory speed differs by 10 mph or more from the posted speed limit. Also review Table 2C-4 for

proper placement of advance warning signs. Be sure to use Turn warning signs in lieu of Curve signs where the advisory speed is 30 mph or less. Where the use of chevrons is required or recommended, follow the guidance in Table 2C-6 for number and spacing of these devices. Follow the requirements and guidance in Section 2C.08 for determining appropriate advisory speeds and need for plaques. Replace any orange background warning signs with yellow sheeting. Consider use of fluorescent-yellow sheeting for warning signs throughout or at special concern locations, such as low radii horizontal curves. Assure all signs are mounted on breakaway supports if within the clear zone.

2. Installation of delineators through several curves appeared to be very effective in providing guidance for drivers, especially at night. However, these installations did not seem to be consistent throughout the section. Review and utilize the guidance in Section 3F.04 and Table 3F-1 of the 2009 MUTCD for a more-consistent application of this potentially-beneficial improvement for nighttime travel.
3. Review current w-beam guardrail installations, especially at bridge approaches, for need of delineation. Consider installation of standard delineators behind the rail or otherwise enhance the visibility with in-rail delineators or reflective devices. Install Type 3 Object Markers at each bridge corner.
4. Review all noted potentially-hazardous side hazards, especially steep slopes, for need of additional shielding with guardrail, either w-beam or high-tension cable rail.
5. Review all intersections with approaches of 75 degrees or flatter for need of realignment to improve visibility for stopped vehicles. Add intersection warning signs where visibility to the intersection is restricted on Hydaburg Highway.
6. Consider installation of additional milepost markers to designate 1/10 mile or 2/10 mile locations to assist law enforcement in locating crashes accurately and when responding to emergencies.
7. Consider installation of a Double Arrow warning sign (W1-7) across from all T intersections.
8. Review existing pavement markings during nighttime driving conditions to assure satisfactory visibility.
9. Perform a speed study to determine the appropriateness of the posted 35 mph regulatory speed limit.
10. Review designated no-passing areas for need of restrictions, particularly the section about three miles northerly from the Miijuu Way intersection.

11. Review the need for various Dips warning signs throughout the reviewed section and remove those not warranted.
12. Review the possible need for pedestrian crossing warning signs at locations, such as the Soda Trail intersection.
13. Review existing turnouts for need of rehabilitation.

Long term

Traffic volume and the current condition of Hydaburg Highway would not appear to justify major improvements at this time; however, consideration could be given to reconstructing the short sections where subbase deterioration has contributed to settlement in the pavement surface, resulting in dips. Elimination of these settlement areas would be beneficial to drivers.

APPENDIX A. IMAGES FROM FIELD REVIEWS

A.1 Kasaan Road Images



Figure A.1. Typical section on Kasaan Road



Figure A.2. Narrow bridge on Kasaan Road



Figure A.3. Signing and beam guardrail at narrow bridge on Kasaan Road



Figure A.4. Steep foreslope on Kasaan Road



Figure A.5. Warning Sign on Kasaan Road



Figure A.6. Damaged beam guardrail on Kasaan Road



Figure A.7. Vandalized regulatory sign on Kasaan Road



Figure A.8. Pipe culvert outlet on Kasaan Road



Figure A.9. Large rock in center of Kasaan Road



Figure A.10. Audit team members on Kasaan Road

A.2 Hydaburg Highway Images



Figure A.11. Roadway section on Hydaburg Highway



Figure A.12. Typical pavement marking on Hydaburg Highway



Figure A.13. Beam guardrail and bridge rail on Hydaburg Highway



Figure A.14. Beam guardrail terminal section on Hydaburg Highway



Figure A.15. Delineators at horizontal curve on Hydaburg Highway



Figure A.16. Damaged warning sign on Hydaburg Highway



Figure A.17. Breakaway sign support base on Hydaburg Highway



Figure A.18. Road cut backslope on Hydaburg Highway

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APPENDIX C. CRASH DATA

Table C.1 2004 Alaska crashes by census area and severity

CENSUS AREA	NUMBER OF ACCIDENTS				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	22	3	2	2	29
NW Arctic	-	-	-	1	1
Nome	14	7	-	-	21
Yukon-Kuskokwim,Denali	27	17	1	3	48
Fairbanks NorthStar	1,494	447	49	10	2,000
SE Fairbanks	84	31	3	1	119
Matanuska Susitna	1,100	378	69	19	1,566
Valdez-Cordova	123	24	4	4	155
Municipality of Anchorage	5,950	2,241	261	29	8,481
Bethel	34	19	1	-	54
Wade Hampton	-	1	-	-	1
BristolBay, Dillingham, Lake&Peninsula	10	7	1	1	19
Kenai	891	295	49	15	1,250
Kodiak	79	27	4	-	110
Aleutians West	16	4	-	-	20
Aleutians East	1	1	-	-	2
Yakutat,Hoonah, Angoon	10	2	1	1	14
Skagway	2	1	-	-	3
Haines-Klukwan	13	3	-	1	17
Juneau	229	136	14	3	382
Sitka	55	17	3	1	76
Petersburg,Wrangell	20	6	2	1	29
Prince of Wales	6	8	1	1	16
Ketchikan Gateway	97	48	6	1	152
All Other	40	10	2	2	54
Statewide	10,317	3,733	473	96	14,619

Table C.2 2004 Alaska crash percentages by census area and severity

CENSUS AREA	PERCENTAGE OF ACCIDENTS				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	0.21	0.08	0.42	2.08	0.20
NW Arctic	0.00	0.00	0.00	1.04	0.01
Nome	0.14	0.19	0.00	0.00	0.14
Yukon-Kuskokwim,Denali	0.26	0.46	0.21	3.13	0.33
Fairbanks NorthStar	14.48	11.97	10.36	10.42	13.68
SE Fairbanks	0.81	0.83	0.63	1.04	0.81
Matanuska Susitna	10.66	10.13	14.59	19.79	10.71
Valdez-Cordova	1.19	0.64	0.85	4.17	1.06
Municipality of Anchorage	57.67	60.03	55.18	30.21	58.01
Bethel	0.33	0.51	0.21	0.00	0.37
Wade Hampton	0.00	0.03	0.00	0.00	0.01
BristolBay, Dillingham, Lake&Peninsula	0.10	0.19	0.21	1.04	0.13
Kenai	8.64	7.90	10.36	15.63	8.55
Kodiak	0.77	0.72	0.85	0.00	0.75
Aleutians West	0.16	0.11	0.00	0.00	0.14
Aleutians East	0.01	0.03	0.00	0.00	0.01
Yakutat,Hoonah, Angoon	0.10	0.05	0.21	1.04	0.10
Skagway	0.02	0.03	0.00	0.00	0.02
Haines-Klukwan	0.13	0.08	0.00	1.04	0.12
Juneau	2.22	3.64	2.96	3.13	2.61
Sitka	0.53	0.46	0.63	1.04	0.52
Petersburg,Wrangell	0.19	0.16	0.42	1.04	0.20
Prince of Wales	0.06	0.21	0.21	1.04	0.11
Ketchikan Gateway	0.94	1.29	1.27	1.04	1.04
All Other	0.39	0.27	0.42	2.08	0.37
Statewide	100.00	100.00	100.00	100.00	100.00

Table C.3 2004 Alaska census area crash percentages by severity

CENSUS AREA	PERCENTAGE OF ACCIDENTS				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	75.86	10.34	6.90	6.90	100.00
NW Arctic	0.00	0.00	0.00	100.00	100.00
Nome	66.67	33.33	0.00	0.00	100.00
Yukon-Kuskokwim, Denali	56.25	35.42	2.08	6.25	100.00
Fairbanks NorthStar	74.70	22.35	2.45	0.50	100.00
SE Fairbanks	70.59	26.05	2.52	0.84	100.00
Matanuska Susitna	70.24	24.14	4.41	1.21	100.00
Valdez-Cordova	79.35	15.48	2.58	2.58	100.00
Municipality of Anchorage	70.16	26.42	3.08	0.34	100.00
Bethel	62.96	35.19	1.85	0.00	100.00
Wade Hampton	0.00	100.00	0.00	0.00	100.00
Bristol Bay, Dillingham, Lake & Peninsula	52.63	36.84	5.26	5.26	100.00
Kenai	71.28	23.60	3.92	1.20	100.00
Kodiak	71.82	24.55	3.64	0.00	100.00
Aleutians West	80.00	20.00	0.00	0.00	100.00
Aleutians East	50.00	50.00	0.00	0.00	100.00
Yakutat, Hoonah, Angoon	71.43	14.29	7.14	7.14	100.00
Skagway	66.67	33.33	0.00	0.00	100.00
Haines-Klukwan	76.47	17.65	0.00	5.88	100.00
Juneau	59.95	35.60	3.66	0.79	100.00
Sitka	72.37	22.37	3.95	1.32	100.00
Petersburg, Wrangell	68.97	20.69	6.90	3.45	100.00
Prince of Wales	37.50	50.00	6.25	6.25	100.00
Ketchikan Gateway	63.82	31.58	3.95	0.66	100.00
All Other	74.07	18.52	3.70	3.70	100.00
Statewide	70.57	25.54	3.24	0.66	100.00

Table C.4 2005 Alaska crashes by census area and severity

CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	22	7	2	-	31
NW Arctic	2	3	-	-	5
Nome	6	2	1	1	10
Yukon-Kuskokwim, Denali	25	12	6	2	45
Fairbanks North Star	1,373	406	48	10	1,837
SE Fairbanks	78	25	7	1	111
Matanuska Susitna	1,069	413	75	19	1,576
Valdez-Cordova	111	18	6	2	137
Municipality of Anchorage	4,870	2,128	245	17	7,260
Bethel	28	11	2	-	39
Bristol Bay, Dillingham, Lake & Peninsula	17	9	1	-	27
Kenai	768	249	30	10	1,057
Kodiak	83	33	6	1	123
Aleutians West	18	6	1	-	25
Aleutians East	1	3	1	1	6
Yakutat, Hoonah, Angoon	13	6	1	-	20
Skagway	9	2	-	-	11
Haines-Klukwan	15	6	1	-	22
Juneau	229	129	10	1	369
Sitka	86	12	1	-	99
Petersburg, Wrangell	19	5	-	1	25
Prince of Wales 	17	13	2	-	32
Ketchikan Gateway	107	64	11	-	182
All Other	48	21	10	1	80
Statewide	9,012	3,583	467	67	13,129

Table C.5 2005 Alaska crash percentages by census area and severity

CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	0.24	0.20	0.43	0.00	0.24
NW Arctic	0.02	0.08	0.00	0.00	0.04
Nome	0.07	0.06	0.21	1.49	0.08
Yukon-Kuskokwim, Denali	0.28	0.33	1.28	2.99	0.34
Fairbanks North Star	15.24	11.33	10.28	14.93	13.99
SE Fairbanks	0.87	0.70	1.50	1.49	0.85
Matanuska Susitna	11.86	11.53	16.06	28.36	12.00
Valdez-Cordova	1.23	0.50	1.28	2.99	1.04
Municipality of Anchorage	54.04	59.39	52.46	25.37	55.30
Bethel	0.29	0.31	0.43	0.00	0.30
Bristol Bay, Dillingham, Lake & Peninsula	0.19	0.25	0.21	0.00	0.21
Kenai	8.52	6.95	6.42	14.93	8.05
Kodiak	0.92	0.92	1.28	1.49	0.94
Aleutians West	0.20	0.17	0.21	0.00	0.19
Aleutians East	0.01	0.08	0.21	1.49	0.05
Yakutat, Hoonah, Angoon	0.14	0.17	0.21	0.00	0.15
Skagway	0.10	0.06	0.00	0.00	0.08
Haines-Klukwan	0.17	0.17	0.21	0.00	0.17
Juneau	2.54	3.60	2.14	1.49	2.81
Sitka	0.95	0.33	0.21	0.00	0.75
Petersburg, Wrangell	0.21	0.14	0.00	1.49	0.19
Prince of Wales 	0.19	0.36	0.43	0.00	0.24
Ketchikan Gateway	1.19	1.79	2.38	0.00	1.39
All Other	0.53	0.59	2.14	1.49	0.61
Statewide	100.00	100.00	100.00	100.00	100.00

Table C.6 2005 Alaska census area crash percentages by severity

CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	70.97	22.58	6.45	0.00	100.00
NW Arctic	40.00	60.00	0.00	0.00	100.00
Nome	60.00	20.00	10.00	10.00	100.00
Yukon-Kuskokwim, Denali	55.56	26.67	13.33	4.44	100.00
Fairbanks North Star	74.74	22.10	2.61	0.54	100.00
SE Fairbanks	70.27	22.52	6.31	0.90	100.00
Matanuska Susitna	67.63	26.21	4.76	1.21	100.00
Valdez-Cordova	81.02	13.14	4.38	1.46	100.00
Municipality of Anchorage	67.08	29.31	3.37	0.23	100.00
Bethel	66.67	28.21	5.13	0.00	100.00
Bristol Bay, Dillingham, Lake & Peninsula	62.96	33.33	3.70	0.00	100.00
Kenai	72.66	23.56	2.84	0.95	100.00
Kodiak	67.46	26.83	4.66	0.81	100.00
Aleutians West	72.00	24.00	4.00	0.00	100.00
Aleutians East	16.67	50.00	16.67	16.67	100.00
Yakutat, Hoonah, Angoon	65.00	30.00	5.00	0.00	100.00
Skagway	81.82	18.18	0.00	0.00	100.00
Haines-Klukwan	68.18	27.27	4.55	0.00	100.00
Juneau	62.06	34.96	2.71	0.27	100.00
Sitka	66.67	12.12	1.01	0.00	100.00
Petersburg, Wrangell	76.00	20.00	0.00	4.00	100.00
Prince of Wales 	53.13	40.63	6.25	0.00	100.00
Ketchikan Gateway	58.79	35.16	6.04	0.00	100.00
All Other	60.00	26.25	12.50	1.25	100.00
Statewide	68.64	27.29	3.56	0.51	100.00

Table C.7 2006 Alaska crashes by census area and severity

CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	27	8	-	2	35
NW Arctic	1	-	-	-	1
Nome	6	5	1	1	13
Yukon-Kuskokwim, Denali	18	9	4	1	32
Fairbanks North Star	982	279	38	13	1,312
SE Fairbanks	78	30	3	1	112
Matanuska Susitna	1,047	334	49	13	1,443
Valdez-Cordova	63	36	3	2	124
Municipality of Anchorage	4,657	1,816	193	18	6,684
Bethel	24	7	2	-	33
Bristol Bay, Dillingham, Lake & Peninsula	15	3	2	2	22
Kenai	729	199	36	11	975
Kodiak	97	19	3	-	119
Aleutians West	11	4	1	1	17
Aleutians East	5	1	-	-	6
Yakutat, Hoonah, Angoon	7	3	-	-	10
Skagway	2	-	-	-	2
Haines-Klukwan	11	3	1	-	15
Juneau	226	122	10	2	360
Sitka	75	24	2	1	102
Petersburg, Wrangell	18	9	2	-	29
Prince of Wales 	35	11	1	-	47
Ketchikan Gateway	91	46	6	1	144
All Other	64	18	4	5	91
Statewide	8,309	2,984	381	74	11,728

Table C.8 2006 Alaska crash percentages by census area and severity

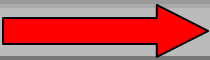
CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	0.32	0.20	0.00	2.70	0.30
NW Arctic	0.01	0.00	0.00	0.00	0.01
Nome	0.07	0.17	0.28	1.35	0.11
Yukon-Kuskokwim, Denali	0.22	0.30	1.11	1.35	0.27
Fairbanks North Star	11.82	9.35	10.53	17.57	11.19
SE Fairbanks	0.94	1.01	0.83	1.35	0.95
Matanuska Susitna	12.60	11.19	13.57	17.57	12.30
Valdez-Cordova	1.00	1.21	0.83	2.70	1.06
Municipality of Anchorage	56.05	60.86	53.46	24.32	56.99
Bethel	0.29	0.23	0.55	0.00	0.28
Bristol Bay, Dillingham, Lake & Peninsula	0.18	0.10	0.55	2.70	0.19
Kenai	8.77	6.67	9.97	14.86	8.31
Kodiak	1.17	0.64	0.83	0.00	1.01
Aleutians West	0.13	0.13	0.28	1.35	0.14
Aleutians East	0.06	0.03	0.00	0.00	0.05
Yakutat, Hoonah, Angoon	0.08	0.10	0.00	0.00	0.09
Skagway	0.02	0.00	0.00	0.00	0.02
Haines-Klukwan	0.13	0.10	0.28	0.00	0.13
Juneau	2.72	4.09	2.77	2.70	3.07
Sitka	0.90	0.80	0.55	1.35	0.87
Petersburg, Wrangell	0.22	0.30	0.55	0.00	0.25
Prince of Wales 	0.42	0.37	0.28	0.00	0.40
Ketchikan Gateway	1.10	1.54	1.66	1.35	1.23
All Other	0.77	0.60	1.11	6.76	0.78
Statewide	100.00	100.00	100.00	100.00	100.00

Table C.9 2006 Alaska census area crash percentages by severity

CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	77.14	17.14	0.00	5.71	100.00
NW Arctic	100.00	0.00	0.00	0.00	100.00
Nome	48.15	38.46	7.69	7.69	100.00
Yukon-Kuskokwim, Denali	58.25	28.13	12.50	3.13	100.00
Fairbanks North Star	74.85	21.27	2.90	0.99	100.00
SE Fairbanks	69.64	26.79	2.68	0.89	100.00
Matanuska Susitna	72.56	23.15	3.40	0.90	100.00
Valdez-Cordova	68.94	29.03	2.42	1.61	100.00
Municipality of Anchorage	68.67	27.17	2.89	0.27	100.00
Bethel	72.73	21.21	6.06	0.00	100.00
Bristol Bay, Dillingham, Lake & Peninsula	68.18	13.64	9.09	9.09	100.00
Kenai	74.77	20.41	3.69	1.13	100.00
Kodiak	81.51	15.97	2.52	0.00	100.00
Aleutians West	64.71	23.53	5.88	5.88	100.00
Aleutians East	63.33	16.67	0.00	0.00	100.00
Yakutat, Hoonah, Angoon	70.00	30.00	0.00	0.00	100.00
Skagway	100.00	0.00	0.00	0.00	100.00
Haines-Klukwan	73.33	20.00	6.67	0.00	100.00
Juneau	62.78	33.89	2.78	0.56	100.00
Sitka	73.53	23.53	1.96	0.98	100.00
Petersburg, Wrangell	62.07	31.03	6.90	0.00	100.00
Prince of Wales 	74.47	23.40	2.13	0.00	100.00
Ketchikan Gateway	63.19	31.94	4.17	0.69	100.00
All Other	70.33	19.78	4.40	5.49	100.00
Statewide	70.85	25.44	3.08	0.63	100.00

Table C.10 2007 Alaska crashes by census area and severity

CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	18	21	6	-	45
NW Arctic	-	1	-	-	1
Nome	3	3	1	-	7
Yukon-Kuskokwim, Denali	19	13	-	3	35
Fairbanks North Star	1,093	327	47	19	1,486
SE Fairbanks	78	19	5	2	104
Matanuska Susitna	1,045	360	61	12	1,478
Valdez-Cordova	58	30	1	3	92
Municipality of Anchorage	3,807	1,435	143	27	5,412
Bethel	23	7	1	-	31
Wade Hampton	-	-	-	1	1
Bristol Bay, Dillingham, Lake & Peninsula	10	4	2	1	17
Kenai	636	250	39	8	933
Kodiak	67	25	1	-	93
Aleutians West	18	5	-	-	23
Aleutians East	-	4	1	1	6
Yakutat, Hoonah, Angoon	4	1	-	-	5
Skagway	7	5	-	-	12
Haines-Klukwan	18	6	-	-	24
Juneau	205	126	13	1	345
Sitka	90	12	3	-	105
Petersburg, Wrangell	20	8	1	-	29
Prince of Wales 	31	13	-	1	45
Ketchikan Gateway	111	30	11	2	154
All Other	64	23	7	1	95
Statewide	7,425	2,728	343	82	10,578

Table C.11 2007 Alaska crash percentages by census area and severity

CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	0.24	0.77	1.75	0.00	0.43
SW-Arctic	0.00	0.04	0.00	0.00	0.01
Nome	0.04	0.11	0.29	0.00	0.07
Yukon-Kuskokwim, Denali	0.26	0.48	0.00	3.68	0.33
Fairbanks North Star	14.72	11.99	13.70	23.17	14.05
SE Fairbanks	1.05	0.70	1.40	2.44	0.90
Matanuska-Susitna	14.07	13.20	17.78	14.63	13.97
Valdez-Cordova	0.78	1.10	0.29	3.68	0.67
Municipality of Anchorage	51.27	52.60	41.69	32.63	51.16
Bethel	0.31	0.26	0.29	0.00	0.29
Wade Hampton	0.00	0.00	0.00	1.22	0.01
Bristol Bay, Dillingham, Lake & Peninsula	0.13	0.15	0.58	1.22	0.16
Kenai	8.57	9.16	11.37	9.76	8.82
Kodiak	0.90	0.92	0.29	0.00	0.60
Aleutians West	0.24	0.15	0.00	0.00	0.22
Aleutians East	0.00	0.15	0.29	1.22	0.06
Yakutat, Hoonah, Angoon	0.05	0.04	0.00	0.00	0.05
Skagway	0.09	0.15	0.00	0.00	0.11
Haines-Klukwan	0.24	0.22	0.00	0.00	0.23
Juneau	2.76	4.62	3.79	1.22	3.26
Sitka	1.21	0.44	0.87	0.00	0.99
Petersburg, Wrangell	0.27	0.29	0.29	0.00	0.27
Prince of Wales 	0.42	0.40	0.00	1.22	0.43
Ketchikan Gateway	1.49	1.10	3.21	2.44	1.46
All Other	0.66	0.64	2.04	1.22	0.90
Statewide	100.00	100.00	100.00	100.00	100.00

Table C.12 2007 Alaska census area crash percentages by severity

CENSUS AREA	NUMBER OF CRASHES				TOTAL
	Property Damage Only	Minor Injury	Major Injury	Fatal	
North Slope	40.00	46.67	13.33	0.00	100.00
NW Arctic	0.00	100.00	0.00	0.00	100.00
Nome	42.86	42.86	14.29	0.00	100.00
Yukon-Kuskokwim, Denali	54.29	37.14	0.00	8.57	100.00
Fairbanks North Star	73.55	22.01	3.16	1.28	100.00
SE Fairbanks	75.00	18.27	4.81	1.92	100.00
Matanuska-Susitna	70.70	24.36	4.13	0.81	100.00
Valdez-Cordova	63.04	32.61	1.09	3.26	100.00
Municipality of Anchorage	70.34	26.52	2.64	0.50	100.00
Bethel	74.19	22.58	3.23	0.00	100.00
Wade Hampton	0.00	0.00	0.00	100.00	100.00
Bristol Bay, Dillingham, Lake & Peninsula	58.82	23.53	11.76	5.88	100.00
Kenai	68.17	26.80	4.18	0.86	100.00
Kodiak	72.04	26.88	1.08	0.00	100.00
Aleutians West	78.26	21.74	0.00	0.00	100.00
Aleutians East	0.00	66.67	16.67	16.67	100.00
Yakutat, Hoonah, Angoon	80.00	20.00	0.00	0.00	100.00
Skagway	58.33	41.67	0.00	0.00	100.00
Haines-Klukwan	75.00	25.00	0.00	0.00	100.00
Juneau	59.42	36.52	3.77	0.29	100.00
Sitka	65.71	11.43	2.86	0.00	100.00
Petersburg, Wrangell	68.97	27.59	3.45	0.00	100.00
Prince of Wales 	68.89	28.89	0.00	2.22	100.00
Ketchikan Gateway	72.08	19.48	7.14	1.30	100.00
All Other	67.37	24.21	7.37	1.05	100.00
Statewide	70.19	25.79	3.24	0.78	100.00