

APPENDIX C

TRAFFIC FORECAST REPORT



JUNEAU ACCESS IMPROVEMENTS SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT

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EXECUTIVE SUMMARY

The purpose of this study was to predict traffic on each of ten Juneau Access Improvement alternatives. This study was prepared in support of the Juneau Access Supplemental Draft Environmental Impact Statement (SDEIS). Alternatives evaluated included the following:

- Alternative 1 – No Build
- Alternative 2 – East Lynn Canal Highway with shuttle ferry to Haines from Katzehin Terminal.
- Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttle
- Alternative 2B – East Lynn Canal Highway to Katzehin, shuttles to Haines and Skagway
- Alternative 2C – East Lynn Canal Highway with shuttle to Haines from Skagway
- Alternative 3 – West Lynn Canal Highway, shuttle ferry from Sawmill Cove to William Henry Bay
- Alternative 4A – Fast Vehicle Ferry (FVF) Shuttle Service from Auke Bay
- Alternative 4B – FVF Shuttle Service from Berners Bay
- Alternative 4C – Conventional Monohull Shuttle Service from Auke Bay
- Alternative 4D – Conventional Monohull Shuttle Service from Berners Bay

All marine alternatives (4A, 4B, 4C, and 4D) include continued mainline service to Haines and Skagway and shuttle ferry service between Haines and Skagway. The forecast includes the 30-year period 2008 to 2038.

Juneau Access Alternative 2 would generate the highest level of traffic, due to its lowest user costs. In 2008, Alternative 2 traffic would average 510 vehicles per day year-round (510 AADT). This is a measure of total traffic in both directions. Summer traffic would average 910 vehicles per day in 2008. By 2038, Alternative 2 traffic will average 930 vehicles per day year-round and 1,640 vehicles daily during the summer.

Annual average daily traffic (AADT), summer average daily traffic (SADT) and winter average daily traffic (WADT) for each alternative for 2008 and 2038 are summarized in the following table.

Juneau Access Traffic Forecasts, 2008 and 2038, by Alternative

Alternative	2008			2038		
	AADT	SADT	WADT	AADT	SADT	WADT
1 - No Build	90	170	40	130	230*	60
2 - East Lynn Highway	510	910	240	930	1,640	430
2A - East Lynn Highway	390	680	180	670	1,190	310
2B - East Lynn Highway	380	680	180	670	1,190	310
2C - East Lynn Highway	410	730	190	730	1,290	340
3 - West Lynn Highway	310	550	140	530	940	250
4A - FVF Auke Bay	140	250	70	220	390	100
4B - FVF Sawmill Cove	170	290	80	270	470	120
4C – Day-boat Auke Bay	100	180	50	150	260	70
4D – Day-boat Sawmill Cove	130	230	60	200	350	90

* The capacity of the No Build Alternative is approximately 170 ADT during the summer. Therefore, summer demand could exceed capacity. However, AMHS could reconfigure its schedule to provide the needed capacity.

The best marine alternative, in terms of traffic generation, is Alternative 4B, which includes fast vehicle ferry service between Sawmill Cove and Haines/Skagway. This alternative would generate average year-round daily traffic of 170 vehicles and 290 vehicles daily during the summer in 2008.

Personal vehicles would account for most of the traffic moving on any of the Juneau Access alternatives. The alternatives that provide uninterrupted highway access to the Alaska-Canada highway system are likely to see relatively greater freight traffic than those alternatives that include a ferry link. In any case, personal vehicles will account for 95 percent or more of all traffic.

Highway traffic estimates presented in the preceding table represent traffic moving between Juneau and northern Lynn Canal. The estimates do not include recreational, commercial or other traffic transiting only a portion of the highway. For example, south of Berners Bay, traffic levels will be higher as a result of local traffic originating in Juneau and traveling to Echo Cove and Berners Bay for recreational purposes, or for purposes related to commercial or industrial development in the area. While outside the scope of this traffic forecast, traffic in the area of the existing terminus of Glacier Highway would likely be about 30 percent higher than the traffic indicated in the table above. Similarly, highway traffic would be higher nearer to Haines and Skagway as a result of local traffic.

With construction of an East Lynn Canal highway (except Alternatives 2B and 2C) approximately 56 percent of traffic would travel to or through Skagway and 44 percent through Haines. With Alternative 2C, 100 percent of the traffic would travel to or through Skagway, with about 30 percent of that traffic moving to or from Haines (via the shuttle ferry). With Alternative 2B, traffic would be split evenly between Haines and Skagway. With Alternative 3, all traffic would move to or through Haines and about 30 percent to or through Skagway. With the all-marine alternatives, approximately 55 percent of traffic would move through Haines and 45 percent through Skagway.

**Distribution of Lynn Canal Traffic between Haines and Skagway
By Juneau Access Alternative, 2008**

Alternative	2008 Traffic (AADT)	# to/thru Haines (AADT)	# to/thru Skagway (AADT)	% to/thru Haines	% to/thru Skagway
2 - East Lynn Highway	510	225	285	44%	56%
2A - East Lynn Highway	390	170	220	44%	56%
2B - East Lynn Highway	380	190	190	50%	50%
2C - East Lynn Highway	410	120	410	30%	100%
3 - West Lynn Highway	310	310	90	100%	30%
4A - FVF Auke Bay	140	80	60	55%	45%
4B - FVF Sawmill Cove	170	90	80	55%	45%
4C – Day-boat Auke Bay	100	55	45	55%	45%
4D – Day-boat Sawmill Cove	130	70	60	55%	45%

Introduction

The purpose of this study is to predict traffic under each of ten Juneau Access Improvement alternatives. The alternatives are summarized below.

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

Alternative 2 - East Lynn Canal Highway with Katzeihin Terminal. This alternative would construct a 68.5-mile-long highway from the end of Glacier Highway at the Echo Cove boat launch area around Berners Bay to Skagway. A ferry terminal would be constructed north of the Katzeihin River delta, and operation of the *M/V Aurora* would change to shuttle service between Katzeihin and the Lutak Ferry Terminal in Haines. Mainline AMHS service would end at Auke Bay, and the Haines to Skagway shuttle service would be discontinued. The *M/V Fairweather* would no longer operate in Lynn Canal.

Alternative 2A - East Lynn Canal Highway with Berners Bay Shuttle. This alternative would construct a 5.2-mile highway from the end of Glacier Highway at Echo Cove to Sawmill Cove in Berners Bay. Ferry terminals would be constructed at both Sawmill Cove and Slate Cove, and shuttle ferries would operate between the two terminals. A 52.9-mile highway would be constructed between Slate Cove and Skagway. A ferry terminal would be constructed north of the Katzeihin River delta, and the *M/V Aurora* would operate between the Katzeihin and the Lutak Ferry Terminals. Mainline AMHS service would end at Auke Bay, and the Haines to Skagway shuttle service would be discontinued. The *M/V Fairweather* would no longer operate in Lynn Canal.

Alternative 2B - East Lynn Canal Highway to Katzeihin, Shuttles to Haines and Skagway. This alternative would construct a 50.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to a point north of the Katzeihin River delta. Shuttle ferry service to both Skagway and Haines would be provided from a new terminal at Katzeihin. The Haines to Skagway shuttle service would continue to operate, with two new shuttle ferries and the *M/V Aurora* forming a three-vessel system. Mainline AMHS service would end at Auke Bay and the *M/V Fairweather* would no longer operate in Lynn Canal.

Alternative 2C - East Lynn Canal Highway with Shuttle to Haines from Skagway. This alternative would construct a 68.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Skagway with the same design features as Alternative 2. The *M/V Aurora* would continue to provide service to Haines. No ferry terminal would be constructed north of the Katzeihin River delta.

Mainline ferry service would end at Auke Bay, and the M/V Fairweather would no longer operate in Lynn Canal.

Alternative 3 – West Lynn Canal Highway. This alternative would extend Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove. Ferry terminals would be constructed at Sawmill Cove and William Henry Bay, and shuttle ferries would operate between the two terminals. A 38.9-mile highway would be constructed from William Henry Bay to Haines with a bridge across the Chilkat River/Inlet connecting to Mud Bay Road. The M/V *Aurora* would continue to operate as a shuttle between Haines and Skagway. Mainline ferry service would end at Auke Bay, and the M/V Fairweather would no longer operate in Lynn Canal.

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

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

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

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

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

For each of these alternatives, traffic in 2008 and 2038 is predicted. The year 2008 is assumed to be the year that each of the alternatives would be fully developed. Traffic is presented in terms of number of vehicles, including Annual Average Daily Traffic (AADT), Winter Average Daily Traffic (WADT), Summer Average Daily Traffic (SADT) and Peak Week Average Daily Traffic (PWADT).

The traffic numbers developed in this study are important in the overall Juneau Access SDEIS in that they provide basic data for the socioeconomic analyses, noise analyses, land use, the benefit/cost analyses, and other aspects of the SDEIS.

Methodology

This traffic forecast comprises several basic steps including:

- Analysis of baseline traffic, i.e. current ferry (AMHS and private) passenger and vehicle traffic, air traffic and barge traffic in Lynn Canal
- Segregation of baseline traffic into market components (Juneau residents, Haines and Skagway residents, other Alaska residents, Yukon residents, and other non-residents)
- Estimation of volume of traffic that would be diverted and induced traffic on an East Lynn Canal Highway (Alternative 2), the least constrained alternative among the range of alternatives considered
- Calculation of traveler costs associated with each Juneau Access alternative
- Development of a travel demand model, based on user costs and traffic for current service and user costs and predicted traffic for an East Lynn Canal Highway (Alternative 2)
- Prediction of traffic, with the travel demand model, for all other Juneau Access alternatives
- Assessment of long-term traffic growth in the Lynn Canal corridor
- Analysis and presentation of 2008 and 2038 traffic for each alternative.

The specific methodology employed in each of these steps is described in the following chapters of this report.

Data Sources

A variety of data sources were used to predict traffic in Lynn Canal. These include:

- Alaska Marine Highway System (AMHS) published and unpublished traffic reports. These include the 2002 Annual Traffic Volume Report (and earlier editions), which provide link and on/off passenger and vehicle traffic. Other AMHS data utilized includes unpublished data on the hometown of ferry passengers in the Lynn Canal market.
- U.S. Bureau of Transportation air carrier passenger traffic data for service between the communities of Juneau, Haines and Skagway.
- Traffic data for private transportation providers offering air or marine service between the communities of Juneau, Haines, Skagway and Whitehorse.
- US Customs border crossing data (Dalton and Fraser border stations). Canadian border crossing data from Canada Customs.
- ADOT&PF highway traffic counts for highways in the Lynn Canal area. Canadian highway traffic counts from Yukon Highways and Public Works.
- Juneau, Haines, and Skagway household surveys conducted in 1994 and 2003. These surveys measured current travel in Lynn Canal and anticipated travel under various access alternatives.

- Whitehorse household survey, conducted in 2003, measuring current and anticipated travel to Juneau, Haines and Skagway.
- Alaska Travelers Survey (ATS), a visitor exit survey that gathers data of non-resident visitor travel patterns, including AMHS and Alcan Highway travelers.
- Case studies from elsewhere in Alaska, the U.S. and internationally. These case studies focused on transportation infrastructure projects that provided a fundamental change in access, for example, bridge replacing a ferry service, or a highway replacing a railroad connection.
- National and international research on induced traffic and travel demand elasticity.

A variety of other data supported this traffic forecast. The cost of transportation is a key factor in predicting traffic. Therefore data on vehicle operating costs, accident costs, and passenger and vehicle fares for ferry use are considered. Also, in transportation planning, travel time is an imported consideration. As such, highway and ferry travel times, standby times and frequency delays are also addressed.

Notes and Limitations

This traffic forecast is prepared within the context of Southeast Alaska's current transportation infrastructure. Implementation of the Southeast Alaska Transportation Plan (SATP) - or some components of the plan - could change travel to and through the region. Road construction in southern Southeast Alaska, for example, could affect traffic flows through Lynn Canal. An updated draft SATP has recently been released for public comment.¹

It is important to recognize the complexity and uncertainty associated with predicting traffic in Lynn Canal for ten different alternatives over a 30-year forecast period. Local population trends, visitor market trends, marketing efforts by communities, gasoline prices, local, regional and national economic conditions, international events as they affect travel, and many other forces would ultimately determine traffic under any single Juneau Access improvement alternative. The study team has developed and utilized a methodology that reflects the inherent uncertainty in the process, is understandable, is consistently applied to all alternatives, and produces relatively conservative results.

This report begins with an analysis of Lynn Canal baseline traffic. Following that, the methodology, analysis and results for the traffic forecasts are presented.

¹ *Southeast Alaska Transportation Plan, Draft Update for Public Review, January 2004, Alaska Department of Transportation and Public Facilities.*

BASELINE LYNN CANAL TRAFFIC

AMHS and air taxi passenger data provide a measure of current travel in Lynn Canal. The 2002 AMHS Annual Traffic Volume Report provides link volume data for Lynn Canal ports. In 2002, 52,395 passengers traveled on a ferry between Juneau and Haines. This includes all passengers who passed through Juneau while on a ferry, as well as passengers who embarked in Juneau and disembarked in Haines or Skagway. A similar number of passengers (52,013) traveled through Lynn Canal southbound on the ferry, originating in either Haines or Skagway. In addition, the AMHS carried 14,673 vehicles between Juneau and Haines, and 14,400 vehicles between Haines and Juneau. These traffic numbers focus on the Juneau-Haines link because historically all (with very few exceptions) Lynn Canal traffic moved through Haines.

Lynn Canal ferry traffic includes approximately 30,000 passengers and 8,000 vehicles transported each way between Haines and Skagway.

Table 1
2002 Alaska Marine Highway System Link Volume Data

	Jun-Hns	Hns-Jun	Hns-Sgy	Sgy-Hns
Passenger	52,395	52,013	32,212	30,643
Vehicles	14,673	14,400	8,548	8,042

Source: AMHS 2002 Annual Traffic Volume Report. In 2002, AMHS Lynn Canal service also included three trips directly from Juneau to Skagway (with 386 passengers and 95 vehicles) and one trip directly from Skagway to Juneau (with 119 passengers and 34 vehicles).

AMHS Traffic Characteristics

Data from the AMHS Reservations Management System (RMS) for Lynn Canal provides more detail on the distribution of traffic throughout the year, and by type of vehicle. This unpublished data captures about 98 percent of all Lynn Canal traffic. The data indicates that about 70 percent of all passenger traffic occurs during the May through September summer season. During the summer, an average of 239 passengers traveled each day on a ferry between Juneau and Haines, along with an average of 56 vehicles (of all types and sizes). During the busiest week of the summer, an average of 417 passengers traveled between Juneau and Haines each day. Daily traffic southbound between Haines and Juneau was slightly higher (435 passengers a day) during the busiest week.

Winter (October through April) traffic between Juneau and Haines averaged 69 passengers and 21 vehicles per day, with about the same level of traffic between Haines and Juneau. Haines - Skagway traffic is even more seasonal, with 82 percent of the passenger traffic occurring during the summer.

In 2002, 753 RVs traveled north between Juneau and Haines. A larger number, 881, traveled southbound from Haines to Juneau. The summer average is about five RVs

per day, with a peak of 15 RVs a day (southbound) during the busiest week of the summer.

The volume of RV traffic on the Haines-Skagway link is significantly greater than RV traffic in Lynn Canal to or from Juneau. Approximately 2,400 RVs traveled between Haines and Skagway in 2002, about 1,200 each way. For the Haines/Skagway link, average daily traffic during the summer was eight RVs each way, with a peak of 17 RVs each day (northbound) during the busiest week.

Well over 90 percent of Lynn Canal RV traffic occurs during the summer, including the Juneau/Haines link (93 percent) and the Haines/Skagway link (98 percent).

Table 2
2002 Lynn Canal AMHS Traffic (Link Volume)*

	Jun-Hns	Hns-Jun	Hns-Sgy	Sgy-Hns
Annual Traffic				
Annual Passengers	51,179	50,900	31,574	30,128
Annual Passenger Vehicles	13,073	12,702	6,973	6,582
Summer Traffic				
Summer Total Passengers	36,536	35,865	25,943	24,460
Percent of Annual Total	71%	70%	82%	81%
Summer Total Cars	8,523	8,313	5,441	5,091
Percent of Annual Total	65%	65%	78%	77%
Summer Average Daily Passengers	239	234	170	160
Summer Average Daily Cars	56	54	36	33
Summer Peak Week Average Daily Passengers	417	435	299	286
Summer Peak Week Average Daily Cars	85	89	61	60
Winter Traffic				
Winter Total Passengers	14,643	15,035	5,631	5,668
Percent of Annual Total	29%	30%	18%	19%
Winter Total Cars	4,545	4,389	1,532	1,491
Percent of Annual Total	35%	35%	22%	23%
Winter Average Daily Passengers	69	71	27	27
Winter Average Daily Cars	21	21	7	7
RV Traffic				
Annual RVs	753	881	1,244	1,187
Summer Total	694	826	1,219	1,164
Percent of Annual Total	92%	94%	98%	98%
Summer Average Daily RVs	5	5	8	8
Summer Peak Week Average Daily RVs	11	15	17	15
Van Traffic				
Annual Vans	567	574	202	178
Summer Total	284	285	96	91
Summer Average Daily Vans	2	2	1	1
Summer Peak Week Average Daily Vans	3	3	1	2
Winter Average Daily Vans	2	2	1	0

*Totals presented in Table 2 differ from the totals in Table 1 because of different data sources. Table 2 data is from the AMHS Reservation Management System (RMS) database, which produces link volume totals about 1 percent lower than those published in the Annual Traffic Volume Report.

Lynn Canal van traffic is consistent throughout the year, averaging about two per day each way (northbound and southbound). For 2002 overall, the AMHS carried 567 vans from Juneau to Haines and 574 vans from Haines to Juneau. Van traffic between Haines and Skagway included 202 vans from Haines to Skagway and 178 from Skagway to Haines.

Lynn Canal Ferry Markets

Other data from the AMHS RMS database provides an indication of the size of various ferry markets and the seasonality of those markets. Based on the place of residence of ticket purchasers, six ferry traveler markets have been quantified. In 2002, non-Alaska residents (excluding Yukon residents) accounted for about 42 percent of passengers traveling north in Lynn Canal on a ferry and disembarking in Haines (this is the total number of non-residents disembarking in Haines, except those that boarded in Skagway). Non-residents accounted for 56 percent of this traffic during the summer. Non-residents account for about the same share of ridership traveling on ferries from Haines to or through Juneau.

For the year overall, Juneau residents accounted for about one-quarter of the ferry travel between Juneau and Haines (specifically, 28 percent of the Juneau to Haines market in 2002 and 25 percent of the Haines to Juneau market). Haines residents also accounted for about one-quarter of the market (24 percent of the Juneau to Haines ferry travel and 25 percent of the Haines to Juneau travel).

Table 3
2002 Lynn Canal AMHS Passenger Market Estimates
(Juneau-Haines and Haines-Juneau)

Market	Jun-Hns*		Hns-Jun**	
	Summer	Winter	Summer	Winter
Juneau residents	5,166	2,901	4,417	2,925
Haines residents	2,417	4,478	2,678	4,632
Skagway residents	15	18	10	65
Yukon residents	102	35	113	46
Other Alaska residents	1,042	706	1,494	1,091
Non-residents	1,448	789	1,781	1,194
Market Total	20,582	8,927	19,721	9,953

*This is the number of passengers traveling on a ferry from Juneau to Haines. It includes all passengers disembarking in Haines, except those that boarded in Skagway.

**This is the number of passengers boarding a ferry in Haines except those traveling to Skagway.

Source: Derived from the AMHS RMS database.

Non-resident passenger traffic in Lynn Canal that was traveling to or from Skagway was at about the same volume as for Haines. Approximately 12,500 non-resident passengers traveled north between Juneau and Skagway, while 11,600 traveled southbound between Skagway and Juneau. Non-residents accounted for about 54 percent of the ferry passenger traffic between Juneau and Skagway, and 50 percent of the Skagway to Juneau traffic. Juneau residents accounted for slightly less than a third of this market, while Skagway residents accounted for 8 to 10 percent.

Table 4
2002 Lynn Canal AMHS Passenger Market Estimates
(Juneau-Skagway and Skagway-Juneau)

Market	Jun-Sgy*		Sgy-Jun**	
	Summer	Winter	Summer	Winter
Juneau residents	5,570	1,831	5,572	2,069
Haines residents	31	19	30	190
Skagway residents	514	1,424	698	1,531
Yukon residents	691	244	845	330
Other Alaska residents	406	83	287	103
Non-residents	9,933	2,080	9,620	1,427
Market Total	17,145	5,681	17,052	5,650

* This is the number of passengers traveling on a ferry from Juneau to Skagway. It includes all passengers disembarking in Skagway, except those that boarded in Haines.

** This is the number of passengers boarding a ferry in Skagway except those traveling to and disembarking in Haines.

Source: Derived from the AMHS RMS data base.

Table 5 provides link volume, by passenger market, for Lynn Canal ferry traffic. Link volume is the total number of passengers on the ferry between two ports, regardless of port of origin or port of destination. This is essentially the sum of Juneau-Haines and Juneau-Skagway passenger traffic. For example, Juneau-Haines link volume in 2002 included approximately 15,500 Juneau resident passengers. Haines-Juneau link volume totaled about 15,000 Juneau residents.

Table 5
2002 Lynn Canal Passenger Link Volume

Market	Jun-Hns		Hns-Jun		Hns-Sgy		Sgy-Hns	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
Juneau residents	10,736	4,732	9,989	4,994	5,725	1,954	5,727	2,162
Haines residents	2,448	4,497	2,708	4,822	478	640	478	761
Skagway residents	529	1,442	708	1,596	633	1,617	810	1,716
Yukon residents	793	279	958	376	1,649	443	1,423	477
Other Alaska residents	1,448	789	1,781	1,194	663	119	579	128
Non-residents	20,582	2,904	19,721	2,053	16,795	858	15,443	424
Total	36,536	14,643	35,865	15,035	25,943	5,631	24,460	5,668

Source: Derived from the AMHS RMS database.

This ferry traffic data can be further consolidated to produce total bi-directional traffic. For example, in 2002, Lynn Canal ferry passengers included approximately 47,800 non-residents traveling in Lynn Canal, either northbound or southbound. About 90 percent of that non-resident travel occurred from May through September.

Table 6
2002 Lynn Canal AMHS Passenger Link Volumes, by Market,
Bi-Directional Totals
(Juneau-Haines/Skagway and Haines-Skagway)

Market	Jun-Hns/Sgy		Hns-Sgy	
	Summer	Winter	Summer	Winter
Juneau residents	20,725	9,726	11,452	4,116
Haines residents	5,156	9,319	956	1,401
Skagway residents	1,237	3,038	1,443	3,333
Yukon residents	1,751	655	3,072	920
Other Alaska residents	3,229	1,983	1,242	247
Non-residents	40,303	4,957	32,238	1,282
Market Total	72,401	29,678	50,403	11,299

Source: Derived from the AMHS RMS database.

Passenger travel in Lynn Canal also includes a significant volume of air travel. According to data provided by the Bureau of Transportation Statistics and data provided by air carriers, approximately 29,000 passengers flew between Juneau and Haines or Skagway. Another 1,300 flew between Haines and Skagway. Seasonal estimates are based on interviews with air taxi operators. These figures include estimates of air passenger travel between Juneau and Whitehorse.

Table 7
2002 Lynn Canal Air Travel Link Volumes, by Season

	Annual Total	Est. Summer Total	Est. Winter Total
Jun-Hns/Sgy	28,903	18,787	10,116
Hns-Sgy	1,291	839	452

Source: Bureau of Transportation Statistics and Lynn Canal air carriers.

Some share of the air market would divert to a surface transportation alternative, if that alternative provides more convenient or lower cost transportation. The percentage of the air market that would divert depends on the specific alternative.

Baseline Lynn Canal traffic also includes a number of passengers traveling on small private ferry/tour vessels (cruise ship passengers are not included in this analysis).

Freight Traffic

Waterborne freight traffic now moving through Lynn Canal includes Alaska Marine Lines barge service and AMHS van service. Northland Services does not normally operate barges to Haines and Skagway, but regularly ships freight vans to and from these communities aboard AMHS vessels. Barged freight arrives in Haines on a weekly basis. During the summer months, Haines receives approximately 30 to 50 cargo vans per week via barge, dropping in the winter to between 15 and 20.

AMHS traffic in 2002 in Haines included 517 disembarking vans and 546 embarking vans (an average of about ten per week). About two-thirds of the embarking van traffic was destined for Juneau. Eight out of ten (84 percent) of the vans disembarking in Haines originated in Juneau.

Some of the vans arriving in Haines by ferry and barge carry freight for local customers; others are destined for the Yukon or Interior Alaska. In 2002, 743 vans crossed northbound through the Canadian Customs station at Pleasant Camp. Truck traffic has been declining steadily since its peak in 1995 when 1,484 trucks traveled north from Haines. Southbound truck traffic on the Haines Highway has also declined, falling from a peak of 1,267 in 1998 to 882 in 2002.

In 2001, 84,000 tons of freight moved through the Skagway harbor, primarily (85 percent) petroleum products (ACOE, 2003). Waterborne freight (other than fuel) arrives in Skagway on a weekly basis through Alaska Marine Lines barge service. During the summer months, Skagway receives approximately 30 cargo vans per week, dropping in the winter to about 10.

In 2002, AMHS traffic in Skagway included 219 vans off-loaded and 184 vans loaded. Freight arriving in Skagway by ferry and barge is for local residents and businesses as well as consumers in the Yukon.

The volume of freight (excluding ore concentrates) moving through Skagway has been declining, but may have stabilized in 2002. According to Yukon border crossing data, 1,646 trucks passed through the border northbound in 2002, up from 1,370 in 2001, but below previous years (1,753 in 2000, 2,196 in 1999, and 3,110 in 1998). Similarly, the number of trucks southbound on the Klondike Highway totaled 1,800 in 2002, up from the 2001 total of 1,639, but below traffic in 2000 (2,080 trucks), 1999 (2,262 trucks), and 1998 (3,147 trucks).

Juneau Access alternatives have varying potential to change how Juneau's freight supply needs are met. Water transportation is the primary method of moving freight to and from Juneau, with Seattle being the primary port of origin and destination. Juneau currently has three times weekly service from Seattle with barges arriving every Monday and Wednesday from Alaska Marine Lines and once a week service from Northland Services, generally on Thursdays.

According to Department of the Army Corps of Engineers report *Waterborne Commerce of the United States for Calendar Year 2001*, total imports at Juneau Harbor included 17,000 tons of groceries, 9,000 tons of lumber and wood products, and 28,000 tons of manufactured equipment, machinery, and products (such as vehicles, boats, machinery, etc.). Juneau also imported 83,000 tons of petroleum products. Outbound freight leaving Juneau by barge included 6,000 tons of alcoholic beverages, 2,000 tons of fish and 1,000 tons of groceries. Largest categories for foreign outbound freight were ore and scrap metal (172,000 tons) and forest products (168,000 tons).

Following development of baseline traffic data, the methodology employed to predict traffic in Lynn Canal for Juneau Access alternatives included two basic steps. The first step was to predict traffic for the alternative that offers the least constraint on travel, i.e. full road construction, with the shortest ferry link (and with the most frequent ferry service), which is the East Lynn Canal Highway Alternative 2.

There are barriers in any transportation corridor; distance to destinations, roadway design speeds, roadway conditions, inter-modal connectors (i.e., ferry links), tolls, fares, etc. Among the Juneau Access alternatives, the East Lynn Canal Highway (Alternative 2) offers the fewest barriers to the greatest share of the travel market. Alternative 2 is not barrier-free. It includes a ferry link to Haines, plus there are potential wintertime road closures due to avalanche control, both of which can constrain travel. Nevertheless, more than any other alternative it provides the most travelers the greatest opportunity to travel when they choose and to travel at the pace they choose.

The second step was to incorporate baseline and East Lynn Canal highway Alternative 2 traffic data into a travel demand model for Lynn Canal and apply that model to all Juneau Access alternatives to predict traffic volumes for each.

Lynn Canal Travel Demand Elasticity

Travel demand elasticity is a measure of the relationship between travel cost and travel demand. Generally, lower-cost travel opportunities result in greater traffic. The study team's approach to quantifying the relationship between traveler costs and demand in Lynn Canal was to analyze travel volume and travel costs for two cases, including:

- Ferry service, travel costs and traffic in Lynn Canal in 2002. This "base case" represents travel at its highest cost, relative to the alternatives proposed to improve Lynn Canal transportation.
- Predicted Lynn Canal traffic under Alternative 2, East Lynn Highway with shuttle ferry service between Katzeihin and Haines. Under this alternative, travel is the least constrained (among the alternatives being considered), meaning that there are the fewest barriers to travel, there is the greatest opportunity to travel, and the travel costs are expected to be lowest.

With travel cost and traffic data for these two cases, it is possible to develop a travel demand elasticity model. Following are the analyses of baseline and East Lynn Canal Alternative 2 traffic.

Base Case and Predicted East Lynn Canal Highway (Alt. 2) Traffic

Base Case Traffic

Traffic is typically reported in terms of daily averages, such as annual average daily traffic (AADT). AADT is a measure of average daily bi-directional traffic, i.e., the number of vehicles passing – in either direction – a given point on a highway. Other measures of traffic including summer average daily traffic (SADT), winter average daily traffic (WADT) and peak week average daily traffic (PWADT) are considered elsewhere in this traffic forecast.

Transportation planning usually focuses on peak day or peak hour traffic. Because of the need to design ferry services around some reasonable average level of traffic, average daily traffic is evaluated in this study. That means that peak hour or peak day traffic may not be accommodated on ferry segments. To design a ferry system that meets peak hour or peak day demand would be to design a system that has significant excess capacity (and is economically highly inefficient).

Table 8 provides 2002 AMHS vehicle traffic in terms of average daily traffic. Over the full year, traffic averaged 80 vehicles a day (80 AADT), while summer traffic averaged 124 vehicles a day (124 SADT). During the busiest week of the year, traffic averaged 200 vehicles a day.

Table 8
Lynn Canal 2002 AMHS Vehicle Traffic
(Juneau to and from Haines/Skagway)

	Cars	RVs	Vans	Total
AADT	73	4	3	80
SADT	110	10	4	124
PWADT	171	23	6	200
WADT	42	<1	3	45

Source: Raw data from AMHS, compiled by McDowell Group.

During 2002, AMHS traffic included an average of 3.6 passengers per vehicle. This average includes walk-on passengers.

East Lynn Canal Highway (Alt. 2) Initial Traffic Estimates

Traffic associated with the East Lynn Canal Highway alternative (Alt. 2) will include diverted traffic and induced traffic. Diverted traffic is simply the traffic that is now transported through Lynn Canal either on a ferry or an airplane that “diverts” to the highway. With construction of a highway along East Lynn Canal, all of the ferry traffic, and a portion of air traffic, will be diverted to the highway. The traffic presented in Table 8, plus diverted air traffic, is equal to total diverted traffic.

Induced traffic stems from unmet or latent demand for Lynn Canal transportation opportunities. Unmet demand is the demand for transportation through the Lynn Canal area that is not currently being met by available ferry and air services. This unmet demand is the result of two related factors, cost barriers and convenience barriers. Regarding cost, there is unmet demand if reduced user costs (air and ferry passenger fares, vehicles fares, and travel time) would stimulate increased travel. Convenience barriers exist if more frequent, more consistent, more “available” transportation opportunities would stimulate increased travel. Traffic (diverted and induced) from each Lynn Canal travel market is discussed below.

Traffic from Juneau, Haines, Skagway and Yukon resident markets

Measuring unmet demand is difficult, and varies from market to market. Though imprecise, survey research is one of the best tools that can be used. By asking residents of Juneau, Haines, Skagway and Whitehorse how frequently they would travel with improved access, one measure of unmet demand is provided. Household survey results suggest that Juneau residents would travel in Lynn Canal significantly more often with either the East Lynn or West Lynn highway options. Whitehorse, a community much more accustomed to highway travel, appears to harbor significant unmet demand for better access to Juneau. The Whitehorse survey found that with a four-hour drive to Juneau from Whitehorse, the typical household might make as many as three trips per year, compared to the current average of less than one. More detailed analysis of survey results follows.

Juneau Residents: In the 2003 Juneau Access Household Survey, Juneau households reported, among household members, an average 2.1 trips to Haines (1.4 by ferry, 0.6 by air, and 0.1 with both air and ferry) over the past year. Juneau households reported an average of 0.9 trips to Skagway (0.7 by ferry, 0.1 by air, and 0.1 by both air and ferry). With the East Lynn Canal Highway, Juneau households indicated they would take 3.6 trips to Haines and 3.4 trips to Skagway. Even accounting for the likelihood that some of these Haines and Skagway visits would be combined into one trip, these survey results suggest a high level of interest in more frequent travel to north Lynn Canal.

If it is assumed that on average each Juneau household would take four trips on the East Lynn Canal Highway, highway traffic of about 250 AADT would be generated. This is derived from 11,500 households, making four round trips, divided by 365 days per year. An assumption of five trips per year would result in traffic of 315 AADT, 25 percent higher than the four round trip assumption.

Survey results from the 1994 Juneau Access Household Survey show similar results. In that survey Juneau households indicated that they made an average of 1.6 trips per year to Haines or Skagway by ferry and 1.1 trips per year by air. With an East Lynn Canal Highway, Juneau households predicted 4.4 trips per year to Haines or Skagway. An average of 4.4 trips indicates traffic of approximately 275 AADT.

For purposes of this study, it is estimated that, if the East Lynn Canal Highway (Alternative 2) were available today, Juneau households would generate traffic of approximately 250 AADT. To place this in perspective, traffic at the end of Glacier Highway in 2002 was 215 AADT.

This Juneau resident traffic includes recreational, other personal and business-related travel. The additional travel would include diverted air travel and induced recreational-related travel. National statistics suggest there is unmet demand for highway travel among Juneau households. According to the 1997 American Travelers Survey, U.S. households take an average of 5.2 personal vehicle trips of over 100 miles (one-way) each year. The average among households in smaller communities is likely much higher.

Haines, Skagway, Whitehorse and the Yukon, and other destinations present numerous attractions for Juneau residents' recreational time. In Haines, for example, well-developed events will attract additional Juneau residents, such as the Kluane to Chilkat Bike Relay, the Southeast Alaska State Fair and Bald Eagle Music Festival, the Great Alaska Craft Beer and Homebrew Festival, the Alcan 200 Road Rally snowmachine race, ACTFEST – Alaska Community Theater Festival, the Alaska Bald Eagle Festival, basketball and softball tournaments, etc. Haines offers drier weather conditions and more predictable winter recreation opportunities. Further, availability of land for development as summer cabins or second homes would spur Juneau resident travel. Given these kinds of attractions, a high level of Juneau resident travel to Haines and other destinations can reasonably be expected, given a significant improvement in access.

Haines and Skagway Residents: The survey results for Haines and Skagway appear to be conservative. Haines residents would see a significant reduction in travel costs associated with Alternative 2. However, resident expectations about future travel don't reflect this cost reduction. It is possible that the relatively low level of travel anticipated by Haines residents reflects a local concern about the economic impact of an East Lynn Canal highway.

2003 household survey results indicate that Haines residents would take an average of 7.2 trips to Juneau via an East Lynn Canal highway. Based on that average, an average travel party size of 2.0 (also from survey results), a total of 991 local households (from the 2000 Census), traffic would be approximately 40 AADT, from the Haines resident market.

The 1994 Juneau Access household survey found that Haines residents expected to make an average of 5.5 trips to Juneau. This frequency of Haines resident travel on an East Lynn Canal Highway indicates traffic of approximately 30 AADT.

From the Haines market, an average of 35 AADT is assumed for this traffic forecast.

In the 2003 survey, Skagway residents predicted an average of 11.7 trips per year to Juneau with an East Lynn Canal highway. Based on a 2000 Census total of 400 households, this would translate into traffic of approximately 25 AADT. The 1994 Juneau Access survey measured anticipated travel among Skagway households of 16.3 trips, which would generate 35 AADT. The Skagway analysis is complicated by the fact that there is a large population influx in the summer associated with the tourism industry. One study indicated that the local population about doubles, to over 1,700 residents (Southeast Strategies, 2000). However, both the 1994 and 2003 Juneau Access household surveys were conducted during the summer and therefore

should capture traffic associated with this seasonal population. For the Skagway travel market, an average of 30 AADT is assumed for this study.

As a point of reference, survey research unrelated to Juneau Access found that Skagway households now take an average of 16 trips to the Yukon (Whitehorse) each year. Most of these trips are for shopping, though a significant percentage of the travel is also associated with winter sports activities, to watch movies, dine, and receive medical care. The drive from Skagway to Whitehorse is about two hours, approximately the same as the drive would be from Skagway to Juneau.

Yukon Residents: Whitehorse residents expressed a very high level of interest in driving to Juneau. The 2003 Juneau Access Household Survey found that 14 percent of Whitehorse households had made a trip to Juneau in the previous 12 months. The household average in Whitehorse was 0.2 trips to Juneau. However, with a highway between Skagway and Juneau, Whitehorse households indicated that they would make an average of 3 trips per year to Juneau. A significant volume of highway traffic could be expected from Yukon residents, given that highway travel is the primary means of transportation to, from and within the province. However, an assumption of three trips per household, if applied to all 7,500 households in Whitehorse, would produce traffic of about 120 AADT, a volume of traffic that seems unlikely in the near-term, though certainly possible in the long-term. For purposes of this analysis, a more conservative assumption is made, which is that Whitehorse households would make an average of 1.5 trips per year initially, generating about 60 AADT. This represents a 20-fold increase in Yukon resident travel to Juneau.

Traffic from elsewhere in Alaska

Travelers from Anchorage, Fairbanks and elsewhere in Alaska comprise a very small portion of current Lynn Canal traffic – less than the equivalent of 10 AADT. This traffic includes Interior Alaska residents traveling on the ferry to destinations south of Juneau, as well as Alaskans traveling to Juneau for personal or business reasons. How much traffic from this market will increase is very difficult to predict. Some of the traffic that now crosses the Gulf of Alaska on the ferry might be diverted to an East Lynn Canal highway. In 2002, 1,200 ferry passengers traveled from Juneau to Valdez or Seward, and 951 made the trip from Valdez or Seward to Juneau.

Access to Alaska's capital has been noted as an important reason to construct a highway to Juneau. Highway access may stimulate more surface travel to Juneau for reasons related to state government operations. However, given that the legislative session is from January to May, when winter driving conditions will constrain travel, a large increase in traffic would not be expected.

In the absence of any data to support a more rigorous analysis of this market, it is assumed that with an East Lynn Canal highway, traffic from Anchorage and Interior Alaska would double to about 20 AADT.

Traffic from non-resident markets

Without detailed survey results, measuring unmet demand in the non-resident (and non-Yukon) visitor market is more uncertain. The various components of the non-

resident visitor market that are potentially affected by improved Lynn Canal access include:

- Independent visitors flying or ferrying to Juneau, but not also visiting Haines, Skagway or destinations north
- Alaska visitors traveling via the Alcan Highway, visiting Haines, Skagway, or Interior Alaska, but not visiting Juneau
- Other visitors to the Yukon (those who fly into Whitehorse) who are not currently visiting Southeast Alaska

There is limited information available on travel patterns among these markets. Information that is available is presented below.

Juneau Independent Visitors: Each year approximately 125,000 visitors arrive in Juneau via airline or ferry (this number does not include non-residents who only stop at the Auke Bay ferry terminal). This includes summer traffic of approximately 70,000 visitors arriving by air and 27,000 summer visitors arriving by ferry.² Survey research is not available for the October through April period, however, total air and ferry visitor traffic during that period is probably about 30,000 visitors.

Alaska Travelers Survey (ATS) data for 2001 and 2003 indicates that 10 percent of Juneau summer independent air visitors (those arriving in Juneau by airline) also visited Skagway and 7 percent also visited Haines. Assuming some overlap among Haines and Skagway visitors, perhaps 12 to 14 percent of Juneau's independent market also makes a Lynn Canal trip. With improved access, more of these independent visitors will travel to Haines and Skagway than is now the case.

ATS data also indicates that independent air visitors to Juneau are very likely to repeat their visit and a key reason is that Juneau is a regional hub, providing access to outlying communities and attractions. For example, 64 percent of Juneau's 70,000 air visitors stated they were very likely to return to Juneau for another visit (that's about 45,000 visitors). Forty percent of those potential repeat visitors (about 18,000) implied that the key reason for their return was to gain access to other areas and attractions, including Glacier Bay and other communities in northern Southeast Alaska. These visitors represent the market from which Haines and Skagway could draw more visitors.

Alcan Highway visitors: The number of visitors traveling to Alaska via the Alcan Highway has been declining since about 1997. The most recent available data is for 2001, which indicates that approximately 73,000 visitors entered Alaska on the highway during summer 2001.³ Though no recent data on highway visitor travel to Haines is available, historically Haines has captured about 40 percent of this market while Skagway has captured about 60 percent of the highway market (there is overlap among visitors to Haines and Skagway - many of the visitors traveling to Skagway are also visiting Haines). Juneau captures only about 20 percent of this

² This traffic includes a small number of visitors who are not technically defined as independent visitors, such as those taking package trips aboard small cruise ships.

³ *Alaska Visitor Arrivals and Profile Summer 2001*, State of Alaska Department of Community and Economic Development, November 2002.

market. Improved access to Juneau and its attractions will increase the percentage of highway travelers that travel through Haines and Skagway to access Juneau.

A visitor exit survey conducted at the Tok border crossing during the 2003 visitor season found a high level of interest in visiting Juneau, if better access were available. While only about 20 percent of the highway market now visits Juneau, the survey found that eight out of ten visitors did not consider traveling to Juneau because of the cost.

Yukon visitors: Though a significant percentage of visitor traffic to the Yukon is destined for Alaska, the Yukon is a popular visitor destination in its own right. A total of approximately 300,000 travelers passed through or visited the Yukon in 2002.⁴ Americans traveling to or from Alaska account for the bulk of this traffic. British Columbia also generates a significant share of this traffic. Further, the European market totaled approximately 17,000 visitors traveling to the Yukon via highway and 9,000 who arrived via air. While virtually no data exists on the number of these visitors traveling to Juneau, improved access would be expected to draw additional visitors from this market.

Summary: Non-residents (excluding Yukon residents) currently generate the equivalent of approximately 60 AADT in Lynn Canal. The specific market with the greatest potential to generate additional Lynn Canal traffic is Juneau's independent visitor market. If Lynn Canal traffic from this market were to increase by 50 percent (from the 16,500 who now visit Haines or Skagway to about 25,000), Lynn Canal traffic would increase by about 20 AADT (with most of the traffic occurring in the summer).⁵ This increase is reasonable given the strong desire within this market to visit areas outside the immediate Juneau area, the broad variety of attractions in Haines and Skagway, plus the scenic attraction of an East Lynn Canal drive itself. Other non-resident markets would be expected to produce smaller numbers of new independent visitors. A total increase of 10 AADT from the Alcan and Yukon visitor markets is assumed for this study. These assumptions result in an increase of 30 AADT over current traffic, for total East Lynn Canal independent visitor traffic of about 90 AADT.

Freight/Industrial Traffic

About one-third of the Juneau resident travel to Haines is business-related, according to the 2003 Juneau Access Household Survey. About one-fifth (22 percent) of Juneau resident travel to Skagway is business-related. Smaller percentages of Haines resident travel (19 percent) and Skagway resident travel (17 percent) to Juneau are business-related. Growth in business-related travel associated with an East Lynn Canal highway is included in the traffic estimates for resident markets described above.

Freight and industrial traffic, as measured by the number of vans moved by the AMHS in Lynn Canal, averaged about 3 AADT in 2002. That year there were 567 vans moved from Juneau to Haines (including vans destined for Skagway) and 574 vans moved from Haines to Juneau (including vans originating in Skagway).

⁴ *Yukon Visitor Statistics, Year-End Report 2002*. Government of Yukon, Department of Business, Tourism and Culture.

⁵ This is based on round-trips, 2.3 passengers per vehicle.

While highway construction would significantly enhance freight movement opportunities in Lynn Canal, transportation by barge would likely remain the mode by which most freight is shipped to Juneau, at least in the foreseeable future. The economies of scale possible with barge service, and the relatively frequent service offered into Juneau, place economics on the side of barge transportation. Freight that does move on the highway is likely to be time-sensitive goods, such as seafood. (Shipment of time-sensitive products out of Juneau could create low-cost back-haul opportunities).

Over the long-term, Juneau could expect growing dependence on overland trucking of basic goods into Juneau, as more and more individual businesses consider the scheduling flexibility trucking could give them. In addition, with highway access, Juneau might develop a dependence on supply centers other than Seattle. Though not addressed explicitly in this study, overland shipment of freight from Midwest commercial centers, for example, could be very competitive with Seattle barge service, especially if some of the supplies moving through Seattle originate in the Midwest.

In summary, while barge service is expected to remain the primary mode for supplying Juneau, Haines and Skagway, an East Lynn Canal Highway would generate freight traffic greater than is now being moved on the ferry. Van and heavy truck traffic is expected to initially average approximately 15 AADT. This translates in to about 5,500 van loads total, or about 2,750 each direction. This includes freight destined for Haines and Skagway, and freight (such as fresh fish, beer and other products) destined for markets outside the region. As a point of reference, truck traffic on the Alcan Highway at the Beaver Creek border station is approximately 7,000 trucks each direction (about 38 AADT)

Summary of East Lynn Canal Traffic

Based on the preceding analysis, “base” traffic demand for an East Lynn Canal highway (Alternative 2) is summarized in the following table. These estimates represent predicted traffic on the highway, if the highway were available today.

**Table 9
Base Traffic Demand for East Lynn Canal Highway, Alternative 2**

Traffic Market	Annual Average Daily Traffic (AADT)
Juneau residents	250
Haines residents	35
Skagway residents	30
Yukon residents	60
Other Alaska residents	20
Non-residents	90
Heavy Freight (Vans)	15
Total	500

Traffic forecasts for 2008, the first year an East Lynn Canal highway could be available, and for 2038, the final year of the forecast period, are provided in a following chapter.

Traffic Estimates for Other Juneau Access Alternatives

With ferry traffic data for 2002 and estimates for demand for an East Lynn Canal Highway (Alternative 2) in hand, it is possible to predict traffic demand for other Juneau Access alternatives. The model developed to predict traffic for other alternatives, and the model's output, are described below.

Introduction

Traffic demand varies according to monetary cost, travel time, travel schedule, potential for delay, perceived safety, availability of ancillary services (food, fuel, accommodations, etc.), location of trip termini, and other factors. Individual travelers respond differently to each factor depending upon their reasons for traveling, whether they are traveling with a vehicle, the make-up of the traveling party, their financial means, their time flexibility, etc.

Given multiple, hitherto untried alternatives, the primary target of this study is a valid comparison of demand by alternative, rather than a detailed prediction of how people will make personal choices. Modeling all the relevant factors (product attributes) and traveler types (market segments) for each alternative would quickly reach unmanageable complexity. Instead, a model was developed to compare each of the alternatives to existing AMHS traffic (80 AADT) and to the projected traffic for the alternative with the least impediments to travel, Alternative 2 (approximately 500 AADT).

The model calculates traveler costs for each alternative and computes traffic based on those costs. The travel cost model considers all sources of traveler or "user" cost normally associated with this type of transportation project. These are: travel time (including loading and unloading for ferries), delays associated with ferry-service frequency⁶, ferry fares for passengers and vehicles, and vehicle ownership, operating and accident costs.

Description of the Travel Cost Model

The model breaks each alternative into legs, with each leg defined by a new mode of travel. The legs run from Auke Bay in Juneau to either Haines or Skagway.

For example, Alternative 1, the no-build alternative, has only one leg between Auke Bay and Haines or one leg between Auke Bay and Skagway, because travel to either destination is accomplished in a single ferry trip. Alternative 3, the West Lynn Canal

⁶ The model does not explicitly address driving delays, including road closure, that may be caused by weather or other factors.

Highway, has three legs to Haines and four to Skagway. The legs to Haines for Alternative 3 consist of Auke Bay to Sawmill Cove (highway), Sawmill Cove to William Henry Bay (ferry), and William Henry Bay to Haines (highway). Since Alternative 3 requires traveling through Haines to get to Skagway, the Skagway legs consist of the three Haines legs plus a ferry leg from Haines to Skagway.

For every leg of each alternative, the model inputs consist of:

- **Distance:** The number of miles in the leg (in either statute or nautical miles).
- **Speed:** The average speed over the leg (in mph or knots as appropriate).
- **Frequency delay:** A measure of schedule convenience based on how often the opportunity to travel is available. Frequency delay for highway travel is zero.
- **Load/unload time:** The model charges the maximum amount of load and unload time to each ferry voyage, using specifications for the applicable vessel from the Marine Segments report. That is, every passenger is assumed to experience a delay equal to the total time needed to load and unload the vessel.
- **Individual fares:** The walk-on fare for ferry legs and zero for highway legs.
- **Vehicle fares:** The vehicle fare for ferry legs and national average vehicle ownership/operating expenses per mile for highway legs.
- **Accident cost per mile:** National average accident costs net of insurance reimbursement for highway legs; zero for ferry legs.
- **Average number of users per vehicle:** For ferry legs this is the average number of passengers per vehicle for ferry travelers between Juneau, Haines and Skagway in 2002 (3.6)⁷. For highway legs this is the average occupancy of a highway vehicle in Alaska (2.3)⁸. This factor is necessary to convert individual and household travel demand into an estimated number of vehicles (AADT) for each alternative. The reader should note that the higher vehicle occupancy rate for ferries compared to roads means that for a given number of travelers (users) there is a lower AADT (number of vehicles) for ferries than for roads.
- **A value for time:** The value assigned to traveler time is based on average Alaska wages and adjusted to account for work-related and non-work related time, depending on trip purpose. The value of time is applied to time underway, load/unload time, and frequency delay.

In addition to the inputs, above, the model computes the following parameters for each leg:

⁷ *Annual Traffic Volume Report, 2002, Alaska Marine Highway System.*

⁸ ADOT&PF

- **Time underway:** miles times average speed
- **Total travel time:** time underway plus load/unload time plus frequency delay time.

For each alternative, the model computes the following:

- **Total time cost:** total travel time multiplied by the value of time
- **Total accident cost:** accident cost per mile multiplied by the number of highway miles in an alternative. Historically, accident cost per mile for ferry passengers has been negligible and is assumed to be zero.
- **Total individual and vehicle fares:** the sum of costs per leg for individuals and for vehicles, including vehicle ownership/operating costs on road legs.
- **Unit user cost:** The unit user cost aggregates the three previous costs while adjusting for the number of users per vehicle. It is the summary measure that is used to estimate the relative traffic demand for each alternative.

Unit User Cost =

$$\frac{((\text{Total time cost per person} + \text{individual fares}) * \# \text{ users per vehicle}) + \text{vehicle fares, and total accident cost per vehicle}}{\# \text{ users per vehicle for either roads or ferries, as appropriate}}$$

The following table shows the unit user costs developed for each alternative.

Table 10
Average Traveler Costs for Juneau Access Alternatives
(Blended Unit User Costs, with Comparison to Current Service)

Alternative	Blended Unit User Cost	Cost Reduction Relative to 2002 Service	% Drop in Cost
2002 Service	\$ 217.16	\$ -	0%
1 - No Build	\$ 194.31	\$ 22.85	11%
4C - Dayboat Auke Bay	\$ 179.03	\$ 38.12	18%
4D - Dayboat Sawmill Cove	\$ 141.59	\$ 64.34	30%
4A - FVF Auke Bay	\$ 132.72	\$ 84.43	39%
4B - FVF Sawmill Cove	\$ 114.27	\$ 96.20	45%
3 - West Lynn Highway	\$ 95.67	\$ 121.49	56%
2A - East Lynn Highway	\$ 78.49	\$ 138.66	64%
2B - East Lynn Highway	\$ 78.81	\$ 138.35	64%
2C - East Lynn Highway	\$ 73.84	\$ 143.31	66%
2 - East Lynn Highway	\$ 60.15	\$ 157.01	72%

This analysis indicates that East Lynn Canal Highway Alternative 2 would have the lowest user costs. Alternative 2 would have an average user cost of \$60.15 per traveler, 72 percent below the cost associated with 2002 service and 69 percent lower than the No-Build Alternative.

Translating Unit User Cost into Traffic Forecasts

Traffic forecasts for each alternative were developed relative to two reference points: 1) at the upper extreme, the maximum traffic expected from the alternative with the lowest unit user cost, and 2) at the lower extreme, 2002 traffic in Lynn Canal.

Of the alternatives being evaluated, the alternative with the lowest unit user cost is Alternative 2. To develop the traffic forecast for Alternative 2 (the upper extreme), demand was estimated based on survey results, visitor statistics, economic factors and other data, as described in the preceding chapters. The resulting traffic forecast, if Alternative 2 were in place today, is 500 AADT, assuming an average vehicle occupancy of 2.3 users.

AMHS traffic in Lynn Canal was equal to approximately 80 AADT in 2002, with an average vehicle occupancy of 3.6 users. Estimated demand for all other alternatives, including the No-Build Alternative, falls between 90 AADT and 500 AADT according to the relative unit user cost for the alternative. Throughout, the marine alternatives (4A, 4B, 4C, 4D and Alternative 1, the No-Build) assume 3.6 users per vehicle. The road alternatives (2, 2A, 2B, 2C, and Alternative 3) assume 2.3 users per vehicle.

Predicted traffic for each alternative is shown in the following table:

Table 11
Traffic Demand for Juneau Access Alternatives
Predicted AADT (if alternatives were in place today)

Alternative	Predicted Traffic (AADT)	% Increase from 2002	% Increase from No-Build
1 - No Build	90	13%	-
2 - East Lynn Highway	500	525%	456%
2A - East Lynn Highway	380	375%	322%
2B - East Lynn Highway	380	375%	322%
2C - East Lynn Highway	400	400%	344%
3 - West Lynn Highway	310	288%	244%
4A - FVF Auke Bay	140	75%	56%
4B - FVF Sawmill Cove	160	100%	78%
4C - Dayboat Auke Bay	100	25%	11%
4D - Dayboat Sawmill Cove	130	63%	44%

This demand model is a simplification of a very complex transportation demand environment. It assumes a demand curve based on the percentage change in user cost between each alternative and the one of next highest cost. As noted, the bounds of the curve are determined by the number of users in 2002 at the low end and the projected number of initial users for Alternative 2 at the high end.

Model Parameters

For readers interested in the details of model input and assumptions, model parameters are described in more detail below.

Distance

Distance consists of the total mileage associated with each leg. The starting point for each alternative is the Auke Bay ferry terminal. End points are either downtown Skagway or downtown Haines. Each leg begins at the point where the preceding leg ends. Road distances are computed in statute miles. Ferry distances are computed in nautical miles. Therefore, for alternatives with a combination of road and ferry legs, it is not appropriate to add the leg distances together.

Speed

Speed is computed in miles per hour for road travel and in knots for ferry travel. Average driving speed is assumed to be 40 miles per hour. This accounts for variations in weather, visibility, road conditions, vehicle type and occasional rest stops. Average ferry speed is specified in the Marine Segments Report. It accounts for weather and maneuvering time.

Load/Unload Time

This is the time needed for vessel loading and unloading for each marine leg. It varies by vessel. Values specified in the Marine Segments Report are as follows:

Table 12
Load/Unload Times by Vessel Type

Vessel Type	Load Time	Unload Time
Fast Vehicle Ferry	25 minutes	25 minutes
All Shuttle Ferries	17 minutes	17 minutes
Monohull Dayboat	17 minutes	17 minutes
Existing Mainliners	30 minutes	30 minutes

Any additional waiting time needed to stage vehicles prior to boarding a ferry is accounted for as part of the frequency delay, below.

Individual and Vehicle Fares

Individual fares are ferry fares for walk-on passengers. Vehicle fares for ferry runs between Juneau and Haines and Juneau and Skagway are based on 2002 AMHS fares using a weighted-average AMHS vehicle size of 17 to 19 feet. A methodology for computing ferry fares for new routes was provided by DOT&PF.⁹ Vehicle fares for shuttle routes are a combination of a base fare and a per-mile fare. For road legs, vehicle fares consist of a national average per-mile ownership/operating cost developed by the American Association of State Highway and Transportation Officials (AASHTO).¹⁰

⁹ Shuttle fares are based on boarding fees of \$6/ vehicle and \$2/ passenger and transit fees of \$.80/ vehicle mile and \$.30/ passenger mile for runs <20 miles and \$.60/ vehicle mile and \$.30/ passenger mile for runs >20 miles.)

¹⁰User Benefit Analysis for Highways Manual, AASHTO, August 2003, page 5-24.

Table 13
Fare Structure Assumptions for Juneau Access Ferry Links

Route	Distance (nautical mi)	In Transit (hr)	Cost per nm (veh./ pass.)	Vehicle Fare (\$)	Passenger Fare (\$)
Auke Bay to Haines	68	4.9	.90/.38	61.00	26.00
Auke Bay to Haines (FVF)	68	2.6	.90/.38	61.00	26.00
Auke Bay to Skagway	81	5.3	1.02/.43	83.00	35.00
Auke Bay to Skagway (FVF)	81	2.8	1.02/.43	83.00	35.00
Haines to Katzehin	7	0.5	1.56/.55	10.90	3.85
Haines to Skagway	15	1.0	1.20/.38	15.80	5.65
Sawmill Cove to Slate Cove	5	0.3	1.86/.65	9.30	3.25
Sawmill Cove to William Henry Bay	13	0.8	1.16/.41	15.05	5.35
Sawmill Cove to Haines	42	3.1	.90/.38	38.00	16.00
Sawmill Cove to Haines (FVF)	42	1.6	.90/.38	38.00	16.00
Sawmill Cove to Skagway	55	3.6	1.02/.43	56.35	23.75
Sawmill Cove to Skagway (FVF)	55	1.8	1.02/.43	56.35	23.75

The equivalent of vehicle fares with respect to road travel are vehicle ownership and operating costs. The model uses national average vehicle costs provided by AASHTO using the most recent data available, Year 2000.¹¹ These costs incorporate both operating costs (fuel, oil, maintenance, tires) and ownership costs, including insurance, license, registration taxes, depreciation and financing). AASHTO computes these costs over the first 60,000 miles of driving, at which point the vehicle is considered fully depreciated. This means that the method tends to over-weight depreciation and finance costs, which are greater in the initial years of ownership. Conversely, it does not consider repair costs, which tend to be low during the first 60,000 miles of ownership. To adjust for this bias, AASHTO recommends weighting depreciation and finance costs at 50 percent of actual costs.

As a proxy for overall vehicle costs, the model incorporates the AASHTO estimate for an SUV driven 15,000 miles per year and adjusted for depreciation and finance costs as described. The result, expressed in 2003 dollars, is \$0.44 per mile.

Accident Cost

A component of travel cost is the cost of accidents. Traffic is influenced by the amount of accident risk and associated cost perceived by travelers to be associated with a particular alternative. For purposes of this analysis, it is assumed that the extent to which traffic for a particular alternative is influenced by accident cost will mirror the actual (historical) accident cost for the relevant mode of travel.

The average annual accident cost, net of insurance reimbursements, reported by AASHTO per mile of road travel for all vehicles and all accidents for the most recent

¹¹ *User Benefit Analysis for Highways*, AASHTO, August 2003, page 5-10.

year, 2000, is \$10.62. The average for passenger cars is \$10.94. The model uses the amount for all vehicles adjusted to 2003 dollars, which is \$0.116 per mile.

Accident cost for ferry travel is virtually zero. There have been \$1.3 million in paid injury and property claims made by passengers against the Alaska Marine Highway System during the past 10 years. During that time the system logged more than 500 million passenger miles, for an expected loss rate of less than one-third of a penny per mile.

Value of Time

The model assigns dollar values to 1) total travel time (the sum of elapsed and load/unload time), and 2) frequency delay (time lost when the schedule of a particular travel mode does not coincide with the preferred departure time for the user). These dollar values are then added to out-of-pocket costs to arrive at a total cost for each alternative.

Assignment of dollar values to time is a broadly accepted method of comparing transportation alternatives. Because of the wide variation among user needs, preferences and financial means, it is inherently an imprecise process. In the absence of a detailed understanding of market preferences, however, assignment of dollar values allows an overall estimate of how users perceive the cost/value relationship for each alternative. The values allow us to draw conclusions about when and how often travelers would use an alternative if it were available.

A criticism of the original Juneau Access Improvement Study was that the traffic projections and user benefit analysis did not sufficiently account for the fact that a large number of Lynn Canal travelers – about three-quarters in summer and nearly two-thirds on a year-round basis – are traveling primarily for pleasure. It was pointed out that pleasure travelers may not consider time spent engaged in certain types of travel as a cost, but rather as a benefit incorporating relaxation, scenery, wildlife viewing, etc.

Market research performed on board AMHS vessels during the past three years has confirmed that most ferry passengers consider travel in Lynn Canal and elsewhere along the Inside Passage to be a desirable way to spend their time. The 800,000 individuals who participated in Alaska cruises last year demonstrate that, under certain circumstances at least, travel in Southeast Alaska is valuable for its own sake.

Nevertheless, due to the often contradictory implications of pleasure as a component of travel value, the model does not attempt to evaluate this factor. Travel on a particular route may be pleasurable, but for most travelers, any particular route and travel duration involves some trade off. For example, time spent in Lynn Canal cannot be spent touring Glacier Bay or hiking the Chilkoot Pass. Further, time spent in Lynn Canal after three days of Inside Passage cruising may be less valuable than time in Lynn Canal after three days of highway driving. How does the pleasure value of riding on a displacement-hull ferry compare with riding on a fast catamaran (FVF)? Is driving a wilderness road more or less pleasurable than traveling by ferry? If a two-hour journey is pleasurable, is a four-hour journey twice as pleasurable? How about a 12-hour journey? Finally, some pleasure travelers are certainly time-

constrained in that they need to make travel connections, fulfill reservations, or complete itineraries within a fixed period.

Rather than attempt to capture the subtleties of pleasure value, the model accepts the fundamental principal of transportation utility that faster is better. Experience has shown that this is a reasonable approach to predicting traffic. Shorter travel times and more convenient schedules are assumed to be net improvements in service that lead to additional traffic. To this end, time saved is counted as a benefit and assigned a dollar value.

The model values time in terms of average wages. The main reason for using prevailing wage to value time is to measure time as nearly as possible in the same scale as the out-of-pocket cost of vehicle operation or ferry passage. That is, even though travelers might honestly value a particular Lynn Canal experience – whale sightings, for example – at hundreds of dollars in terms of pleasure, most people make travel decisions based on more mundane considerations of what they can afford. What they can afford, in turn, reflects what they earn or have saved. Thus, the intangible “value of time” is expressed in the same units as tangible travel costs such as ferry fares and vehicle fuel. The two are then added to reach an overall measure of the price users must pay for each alternative.

For the purpose of predicting traffic, the travel factors model assigns dollar values to time as follows:

- Time is typically valued in terms of prevailing wage rates for work-related travel, with values for non-work time ranging between 40 and 60 percent of wage rates for non-work travel. The average Alaska monthly wage is approximately \$3,058 or \$18.20 per hour. Non-work travel time is valued at 50 percent of this wage, or \$9.10 per hour.¹²
- The distribution of work and non-work travelers is based on three major market research efforts: the 2002 Alaska Visitor Statistics Program, the 2000 AMHS Marketing and Pricing Study, and McDowell Group’s Alaska Travelers Survey. This research indicates approximately 65 percent of current AMHS passengers in Lynn Canal are primarily traveling for pleasure. Only about 13 percent of AMHS travel is purely for business.¹³ Estimates of new (induced) traffic for the improved-access alternatives show that a split of approximately 15 percent business and 85 percent pleasure or personal travel is likely for future Lynn Canal travelers.

As a result, the wage used to compute the value of travel time is a weighted average of 15 percent work time at \$18.20 per hour and 85 percent pleasure time at \$9.10 per hour, a blended value of \$10.47. This is a conservative estimate in that it is calculated on the basis of pre-tax income.

¹² Transportation literature provides little empirical basis for refining time valuation. In this analysis, using after-tax, rather than before-tax wages or making a different allowance for non-work vs. work time has minimal effect on forecast traffic, provided the measure is applied consistently to all alternatives.

¹³ E.g., McDowell Group, *Alaska Marine Highway System Marketing and Pricing Study*, September, 2000, Vol. 2, page 15-16.

These assumptions are, to a degree, arbitrary. Yet they serve the important purpose of creating a point of reference between the tangible (financial) and intangible (time) costs of travel. Further, they address the difference in time value for each of the two main groups of travelers, work-oriented and pleasure-oriented.

Frequency Delay Time

Frequency delay is a measure of schedule convenience. A schedule that allows for continuous departures throughout the day, i.e. a road, has no frequency delay because travelers can depart at will. For other modes, frequency delay is defined as the difference between when the traveler would prefer to travel and the specific opportunities to travel afforded by the travel mode. In the case of relatively short mass transit routes used primarily for commuting to and from work, frequency delay may be estimated by comparing the mass transit schedule and capacity to normal commuting cycles.

In the case of Lynn Canal, there is no existing travel pattern independent of ferry and air schedules. Further, since most users are pleasure travelers, there is no obvious preference for travel at particular times, and many travelers have reasonably productive alternative uses for their time. As a result, frequency delay may vary widely from traveler to traveler depending on a host of individual needs and preferences. Since it is impossible to learn or model preferences at this level of detail, frequency delay must be estimated on the basis of general tendencies.

The method used for estimating frequency delay in the original Juneau Access Study was based on travel counts made throughout the day on highways outside Haines and Skagway. The method was criticized, among other reasons, for not accurately representing travel preferences and not taking into account the value of alternative ways in which “delay” time might be spent. This model takes a different approach to modeling the frequency delay associated with ferry travel.

For reasons of efficiency, ferry operations for the vessels proposed for Lynn Canal tend to fall within a 16-hour day. This represents two crews working eight-hour shifts and leaves a third eight-hour shift for maintenance, if needed. Sixteen hours also corresponds roughly to the amount of daylight available during the summer season, when about 70 percent of Lynn Canal travel occurs. Other things being equal, daylight travel in wilderness areas is safer and less stressful and is therefore assumed to be preferable to nighttime travel.

Frequency delay is therefore computed on the basis of the number of travel opportunities available during a 16-hour day for any particular leg. For example, a shuttle ferry operating four times per day in each direction on the leg between Sawmill Cove and William Henry Bay is assumed to divide the 16-hour day into four segments of four hours each. The average amount of time between when a passenger would prefer to travel and the nearest opportunity would therefore be two hours, halfway between any two departures.¹⁴

¹⁴ Depending upon how departures are scheduled throughout the day, these assumptions may not hold entirely true, for example at the beginning and end of the day. However, they are accurate enough to provide a model for average traveler inconvenience resulting from ferry schedules.

While it is true that some travelers will be time-constrained in ways that make it impossible to catch an earlier departure, it is assumed that those people are able to obtain utility equal to the value of time for at least half of the interval between departures. That is, they will not choose to spend more than half the interval between departures simply waiting unproductively at the terminal.

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LONG-TERM TRAFFIC PREDICTIONS

First Year Traffic Forecasts

The year 2008 has been designated as the first year that Juneau Access alternatives could be fully available for travel. The traffic estimates in the preceding chapter referred to traffic if the access improvement were in place today. Traffic estimates for 2008, presented in the following table, were calculated by increasing traffic from the base estimate by 0.5 percent annually. This is a blended growth rate incorporating trends in key traffic markets, including population growth in Juneau, Whitehorse, Haines and Skagway, plus growth in the non-resident visitor market. All of these traffic markets have been growing very slowly, are flat or even declining slowly, thus the growth rate of only 0.5 percent annually through 2008.

Traffic forecasts for 2008 are presented in terms of annual average daily traffic (AADT), summer average daily traffic (SADT, average daily bi-directional traffic during the 150-day May through September period), winter average daily traffic (WADT, average daily bi-directional traffic during the 215-day October through April period), and peak week average daily traffic (PWADT, average daily bi-directional traffic during the busiest week of the year).

Table 14
Juneau Access Traffic Forecasts, 2008, by Alternative

Alternative	Base AADT**	2008 AADT**	2008 SADT	2008 WADT	2008 PWADT
1 - No Build	90	90	*170	40	*330
2 - East Lynn Highway	500	510	910	240	1,800
2A - East Lynn Highway	380	390	680	180	1,350
2B - East Lynn Highway	370	380	680	180	1,340
2C - East Lynn Highway	400	410	730	190	1,450
3 - West Lynn Highway	310	310	550	140	1,100
4A - FVF Auke Bay	140	140	250	70	490
4B - FVF Sawmill Cove	160	170	290	80	580
4C – Day-boat Auke Bay	100	100	180	50	360
4D – Day-boat Sawmill Cove	130	130	230	60	460

**The capacity of the No Build Alternative is approximately 170 ADT during the summer. Therefore, peak summer demand could exceed capacity. However, AMHS could reconfigure its schedule to provide the needed capacity.

**Some changes from Base to 2008 traffic do not appear because of rounding.

The seasonal traffic estimates presented in the preceding table are based on distributions evident in Lynn Canal traffic today. Currently, average daily summer-season traffic is approximately 1.77 times AADT. Peak-week average daily traffic is approximately 3.5 times AADT. Daily winter traffic is approximately half of AADT. These distributions have been assumed for future traffic for each alternative.

30-year (2038) Traffic Forecasts

The year 2038 has been designated as the final year of the forecast period. A great variety of forces would determine how traffic increases (or decreases) for each alternative, over the long term. Most important are population trends in Juneau, Haines, Skagway, and Whitehorse. Growth or decline in Alaska's independent visitor market would also be important. Other factors include the type of business and economic development in the region's communities. From a very broad perspective, long-term traffic would be affected by gasoline prices, international events (which could affect visitor travel to the region), and local residents' choices about where they spend their recreational time.

While there are a myriad of factors that would determine traffic growth for each Juneau Access alternative, this analysis considers only the most important.

Juneau, Haines and Skagway population trends: A recent McDowell Group study completed for the City and Borough of Juneau examined long-term population growth for the purpose of predicting traffic patterns for the Juneau Second Crossing project. McDowell Group predicted low, medium, and high growth population scenarios for 30 years of 0.5, 1.0, and 1.5 percent average annual growth. These growth rates are roughly comparable to past growth rates in Juneau. Over the past 20 years, Juneau's population has grown at an annual average rate of 1.5 percent. The ten-year average was 0.9 percent and the five-year average was 0.8 percent.

Under the low growth scenario, Juneau's population (which in 2002 was 30,981, according to the Alaska Department of Labor) reaches 37,000 in 30 years, and under the high growth scenario the population grows to 52,000. All growth forecasts for Juneau's population assume that some new program for revenue enhancement by the state is initiated, that state government employment in Juneau stabilizes, and that Juneau remains Alaska's capital.¹⁵

Haines' population of 2,360 in 2002 was essentially the same as it was in 1996, and has in fact declined by about 5 percent since peaking in 1999. This no-growth/slow decline situation is typical of Southeast communities in recent years, all of which are experiencing economic change. Within such an unstable economic environment, it is particularly difficult to predict population growth in the short-term, let alone over the next 30 years. However, for planning purposes, it is reasonable to assume that Haines' population will stabilize, and perhaps begin growing slowly. Using past trends as a guide, low, medium, and high case population forecasts are defined. Over the past 20 years, Haines' population has grown at an annual average rate of 1.2 percent. The ten-year historical growth rate was 0.6 percent and the five-year growth rate was -0.4 percent. For this analysis, the low case is assumed to be no growth. In the medium case, annual average growth of 0.6 percent is assumed, resulting in local population of 2,900 by 2038. The high case assumes 1.2 percent annual growth. In the high case, Haines' population would reach about 3,600 by 2038.

¹⁵ *Juneau Second Channel Crossing Project Population Forecast*, prepared by McDowell Group, Inc. for HDR, Inc. and the Alaska Department of Transportation and Public Facilities, October 2003.

Skagway's population (862 residents in 2002) is expected to continue growing slowly. Projecting past trends into the future provides an indication of where the community's population could be by 2038. Skagway's population has been growing at an annual average rate of 0.3 percent over the past 20 years, 1.1 percent over the past 10 years, and 0.6 percent over the past five years. Based on these trends, a low-case growth rate of 0.3 percent annually would push Skagway's population to about 930 year-round residents within 30 years. With a mid-case growth rate of 0.6 percent annually, the community's year-round population would increase to about 1,040 residents. Skagway's population would grow to about 1,200 with an annual growth rate of 1.1 percent, in the high case.

Yukon population trends: The Yukon Territory population in June of 2003 was 29,976. The capital city, Whitehorse, represents 74 percent of this population at 22,241. Population in both Whitehorse and the Yukon Territory has been steadily declining over the last six years. In Whitehorse, the population went from 23,406 in 1998 to 22,241 in 2003. For the Yukon Territory, the population went from 32,058 in 1998 to 29,976 in 2003.

The Yukon Executive Council Office Bureau of Statistics published a 10-year population forecast for the Yukon Territory to the year 2038 depicting low, medium, and high growth scenarios. Population in the Yukon Territory for 2038 using the low growth scenario is predicted at about 28,250, a decline of approximately 1,730 persons from 2003. If that rate of decline were to persist until 2038, the population would drop to around 25,000.

Under the medium growth scenario, Yukon Territory population would grow at an annual rate of 0.5 percent to approximately 31,600 in 2038, an increase of approximately 1,600 persons from 2003. Carrying the medium growth population growth rate estimate out to the year 2038, Yukon Territory population would be 35,970, an increase of approximately 6,000 persons.

Under the high growth scenario, the population in the Yukon Territory would increase at an annual rate of 1.6 percent to approximately 51,900 by 2038, an increase of 21,900 persons from 2003. Carrying the high growth population growth rate estimate out to the year 2038, Yukon Territory population would be about 51,900, an increase of approximately 21,900 persons.

Independent visitor market trends: The Alaska independent visitor market overall has apparently been declining. Based on Alaska Visitors Statistics Program data, Alaska independent, pleasure-related visitor traffic declined from 300,000 visitors in 1993 to about 275,000 visitors in 2001. Available data suggests that this decline continued through 2002. The number of visitors arriving in Alaska by highway has also declined steadily, as has the number of visitors arriving by ferry. The outlook for Alaska's independent visitor market is uncertain. In the short-term, an increase in the state's marketing program from \$6 million to \$10 million should help reverse the decline in the independent visitor market. On the other hand, the national trend toward shorter vacations could limit growth in the Alaska market. Over the long term, the state's commitment to marketing, the perceived safety of overseas travel, exchange rates, demographic shifts, and other factors will determine how many independent visitors travel to Alaska. The best that Alaska can hope for, in the near-

term, is some stabilization in the independent market, and over the long-term a slow growth of perhaps 1 to 1.5 percent annually. The outlook for Juneau's independent visitor market in the absence of improved transportation infrastructure is also for slow growth.

Haines' independent visitor traffic has been declining. In 1992, ferry traffic included 45,300 disembarking passengers and 15,100 vehicles. In 2002, disembarking traffic totaled 36,900 passengers and 13,400 vehicles. While still well below peak levels, 2002 traffic was up by about 11 percent compared to 2001. Embarking traffic followed the same trends. The number of air taxi passenger arrivals in Haines has also declined. In 1998, 10,000 passengers traveled from Juneau to Haines. In 2001, the total was 6,900 passengers (2002 data is not available). Bus traffic to and from Haines is also declining. In 1998, 338 busses carrying 2,981 passengers crossed into the U.S. at the Haines border station. In 2002, bus traffic was down to 141 busses and 1,006 passengers.

Independent visitor travel to Skagway has also been declining. In 2002, 86,000 travelers arrived in Skagway via personal vehicle, according to border crossing data. Another 4,200 arrived via bus. In 1998, 98,000 visitors arrived in Skagway via personal vehicle, 94,000 in 1999, 91,000 in 2000, and 87,000 in 2001. Similarly, bus traffic has declined sharply, falling from 11,700 passengers in 1998 to 7,700 in 1999, 6,800 in 2000, and 5,200 in 2001. Ferry traffic has also declined in recent years. The number of disembarking passengers in Skagway was at over 40,000 in 1995 and years prior to that, but totaled only 32,600 passengers in 2002. However, passenger arrivals increased in 2002 compared to 2001, when arrivals totaled 29,100. Air taxi passenger arrivals are also down somewhat from historical levels. In 2001 (the most recent available data), air traffic from Juneau totaled 7,200 passengers, up from 2000 (6,700 passengers) but below the 1998 total of about 8,100 passengers.

Summary of Long Term Growth

This overview of population and visitor market trends suggests relatively slow rates of growth in all the markets that would be generating traffic in Lynn Canal. This implies that slow rates of growth in traffic should also be assumed. Long-term rates of growth of around 1 to 1.5 percent would be appropriate, given regional population and market trends.

Basing long-term traffic growth solely on population or market growth, however, would likely understate actual traffic because induced traffic would not be accurately represented in the forecast. There would be induced traffic stemming from changes in the socioeconomic make-up within the markets that generate traffic. Improved transportation between communities results in increased social, cultural and economic interaction. However, survey research is limited in its capacity to address this issue because it measures only residents' perceptions about travel in Lynn Canal within the context of existing attractions and reasons to travel. It is likely that within the 30-year forecast period considered in this study the number of specific reasons to travel to or through Haines and Skagway will far outnumber those available today.

To the extent that each Juneau Access alternative results in better transportation through Lynn Canal, each alternative has the potential to strengthen social, cultural and economic linkages between Juneau, Haines, Skagway and Whitehorse. This potential is clearly greatest with the alternatives that offer the lowest user cost, and in particular the alternatives that have uninterrupted highway access between the largest population centers, Juneau and Whitehorse.

To predict traffic in 2038 for each Juneau Access alternative, growth rates for all alternatives are assumed to fall within the range of 1 percent to 2 percent annually. Where within this range each alternative falls depends on how much of an improvement the alternative is in terms of user costs. East Lynn Highway Alternative 2 results in the lowest user cost, therefore a 2 percent annual growth rate is applied. The No Build Alternative has the highest user costs among the alternatives considered and the growth rate applied to this alternative is about 1.2% percent. All other alternatives fall within this range, depending on each alternative's user cost (user cost are described in detail in the preceding chapter).

Annual growth rates for each alternative are provided in Table 15. Based on these growth assumptions, 2038 traffic forecasts are presented in Table 16.

**Table 15
Juneau Access Traffic Long-term Growth Rates, by Alternative**

Alternative	Ave. Annual Growth Rate
1 – No Build	1.1%
2 - East Lynn Highway	2.0%
2A - East Lynn Highway	1.9%
2B - East Lynn Highway	1.9%
2C - East Lynn Highway	1.9%
3 - West Lynn Highway	1.8%
4A - FVF Auke Bay	1.5%
4B - FVF Sawmill Cove	1.6%
4C - Dayboat Auke Bay	1.2%
4D - Dayboat Sawmill Cove	1.4%

**Table 16
Juneau Access Traffic Forecasts, 2038, by Alternative**

Alternative	AADT	SADT	WADT	PWADT
1 - No Build	130	*230	60	*460
2 - East Lynn Highway	930	1,640	430	3,250
2A - East Lynn Highway	670	1,190	310	2,360
2B - East Lynn Highway	670	1,190	310	2,350
2C - East Lynn Highway	730	1,290	340	2,560
3 - West Lynn Highway	530	940	250	1,860
4A - FVF Auke Bay	220	390	100	780
4B - FVF Sawmill Cove	270	470	120	940
4C – Day-boat Auke Bay	150	260	70	520
4D – Day-boat Sawmill Cove	200	350	90	690

* The capacity of the No Build Alternative is approximately 170 ADT during the summer. Therefore, summer demand could exceed capacity. However, AMHS could reconfigure its schedule to provide the needed capacity.

Non-Through Traffic

The highway traffic forecasts presented in the preceding tables represent through traffic only. It does not include all highway users. For example, south of Berners Bay, traffic levels will be higher as a result of non-through traffic originating in Juneau and traveling to Echo Cove and Berners Bay for recreational purposes, or for purposes related to development of private property in the area. While outside the scope of this traffic forecast, we would estimate traffic in the area of the existing terminus of Glacier Highway to be about 30 percent higher than the traffic indicated in the table above.

Similarly, the West Lynn Canal Highway traffic does not include recreational or other non-through, Haines-originated traffic on the West Lynn Highway, such as traffic between Haines and Davidson Glacier, which could be substantial.

Vehicle Mix

Personal vehicles are expected to account for the vast majority of vehicles moving on any of the Juneau Access alternatives. Certainly, the alternatives that provide uninterrupted highway access to the Alaska-Canada highway system are likely to see greater freight traffic than those alternatives that include a ferry link. But even for those alternatives where increased freight traffic is expected, personal vehicles will account for 95 percent of all traffic. Vehicle mix data for each alternative is included in the appendices.

Traffic Distribution

Another important consideration in the traffic analysis is the distribution of Lynn Canal traffic between Haines and Skagway. This is important because traffic volumes will dictate socioeconomic impacts in each community.

A number of assumptions were made to predict Haines/Skagway traffic distribution for the East Lynn Canal Highway alternatives. These include:

- For the Juneau resident market, interest in travel to Haines and Skagway is about evenly split, as indicated in the 2003 Juneau Access Household Survey. Juneau households expect to take between three and four trips to each community annually. Therefore, it is assumed that Juneau resident traffic would be split 50/50 between Haines and Skagway.
- It is assumed that 100 percent of Haines residents traveling through Lynn Canal would be traveling to or from Haines and 100 percent of Skagway residents traveling through Lynn Canal would be traveling to or from Skagway.
- It is assumed that 90 percent of Whitehorse resident traffic would travel through Skagway, and 10 percent through Haines.
- The non-resident visitor market would be split with 60 percent of the market traveling through Skagway and 40 percent through Haines. This slight differential is based on Skagway's better-developed visitor attractions and a greater market presence (though Haines is better equipped to meet the needs of the RV market).
- Other Alaskans (from the interior) are expected to favor a Haines route, due to the shorter distances and travel times to Juneau from the interior. Sixty (60) percent of this relatively small market is expected to travel through Haines, and 40 percent through Skagway.

These assumptions, weighted according to the approximate size of each market, were utilized in the development of the following table, which presents traffic to and through Haines and Skagway for each alternative.

Traffic distribution for all ferry alternatives is assumed to match current traffic patterns, which is 55 percent through Haines and 45 percent through Skagway.

It should be noted that all Lynn Canal traffic would pass through Haines in the West Lynn Canal Highway alternative and all traffic would pass through Skagway on the East Lynn Canal Highway, Alternative 2C (where ferry service to Haines is from Skagway rather than Katzehin).

Table 17
Distribution of Lynn Canal Traffic between Haines and Skagway
By Juneau Access Alternative, 2008

Alternative	2008 Traffic (AADT)	# to/thru Haines (AADT)	# to/thru Skagway (AADT)	% to/thru Haines	% to/thru Skagway
2 - East Lynn Highway	510	225	285	44%	56%
2A - East Lynn Highway	390	170	220	44%	56%
2B - East Lynn Highway	380	190	190	50%	50%
2C - East Lynn Highway	410	120	410	30%	100%
3 - West Lynn Highway	310	310	90	100%	30%
4A - FVF Auke Bay	140	80	60	55%	45%
4B - FVF Sawmill Cove	170	90	80	55%	45%
4C – Day-boat Auke Bay	100	55	45	55%	45%
4D – Day-boat Sawmill Cove	130	70	60	55%	45%

In summary, for the East Lynn Canal Highway alternatives (with the exception of 2B and 2C), approximately 44 percent of all traffic would be expected to travel to or pass through Haines. Because of higher user costs, traffic on 2C would be lower than on Alternative 2. The reduction in traffic would all come at the expense of Haines-bound travelers, therefore Haines would capture a smaller share (30 percent) of the overall traffic. With Alternative 2B, traffic would be split more evenly between Haines and Skagway, due to a reduction in Whitehorse traffic (which would be constrained by the Skagway/Katzehin ferry).

Case Studies and Regional Traffic

In certain instances, case studies can provide insight into how markets respond to an improvement in transportation infrastructure. Such information can guide the development of appropriate methodologies in planning efforts, such as Juneau Access. However, the study team was unsuccessful in identifying transportation infrastructure projects that could serve as meaningful case studies for this project. A couple of international projects were examined. These are summarized below. Juneau Access is truly unique in terms of the range of alternatives being considered, geographic and operational parameters, and the size of the market to be served.

Case Studies

Though far larger in scale, one of the more interesting projects identified was the Oresund Fixed Link between Denmark and Sweden. This 16-kilometer tolled bridge-tunnel project connects the cities of Copenhagen and Malmo and was opened in 2000. The \$2 billion, "Fixed Link" connection includes a four-kilometer, two-level tunnel through relatively shallow water, a four-kilometer long island built from rock, and the eight-kilometer Oresund Bridge, the world's longest cable suspension bridge with a highway on the top deck above a railway, across the Oresund Channel to Malmo in Sweden. With the opening of the bridge-tunnel, travelers can now choose between traveling by car or rail, or they can continue to choose one of the 25 competing ferry lines in the area. The bridge was expected to carry 11,800 vehicles per day. The 2002 average was approximately 9,400 vehicles per day.¹⁶

The Oresund traffic modeling processes provided travel forecasts for different modes and for different routes of traffic crossing the Oresund at a fine level of detail, including between which origin and destination zones people travel, which network links, and which public transport services would be used. The Oresund Bridge Traffic Model contains a set of sub-models for different elements of forecasting (short distance passenger trips, long distance passenger trips and freight transport). Each of them includes traffic generation, destination choice, mode choice and choice of crossing. The number of trips generated to each zone is dependent on the forecasting of population, employment and economic activity data. The model identifies different kinds of trips (work trips, shopping trips etc.; trips made by residents and by non-residents), different modes (car, bus, ship and multi-modal transport) as well as different crossings (mainland roadways and trains; ship and ferry lines).

Another potentially comparable transportation project considered for this study was the 12.9-kilometer Confederation Bridge to Prince Edward Island, the longest bridge over ice-covered waters in the world. The \$1 billion, two-lane bridge officially opened in 1997. The Confederation Bridge project is interesting because it gives travelers the choice of taking a ferry to and from Prince Edward Island, or taking the toll bridge. Available traffic data indicates that opening of the bridge relieved substantial pent up travel demand. Auto and pick-up truck traffic on one of the nearby ferry links dropped from about 500 AADT to about 315 AADT. Data for a second ferry link is unavailable, therefore it is not possible to gauge induced traffic. Meanwhile, traffic on the bridge two years after it opened was at 4,400 AADT.

Regional and Local Traffic

It is sometimes informative to place traffic projections in perspective by comparing them with traffic on existing highways. Following are traffic statistics for a variety of local and regional highways:

- **Richardson Highway:** Valdez, with a population of approximately 4,200, is 300 miles and about 6 hours driving time from Anchorage and 365 miles (7 hours drive time) from Fairbanks. Traffic on the Richardson Highway about 20 miles

¹⁶ Source: www.oeresundsbron.com.

north of Valdez averaged 475 AADT in 2002. This is the lowest traffic point on the highway. Traffic on the Richardson Highway is seasonal, with a large influx of both resident and non-resident visitors during the summer.

- **Prince Rupert:** With a population of about 13,000, Prince Rupert's regional transportation infrastructure includes highway, rail, ferry and air service linkages. Traffic on the Yellowhead Trans-Canada Highway about half way between Prince Rupert and Terrace averaged 1,615 vehicles per day during the summer of 2001.¹⁷ Annual average traffic was 1,233 vehicles.
- **Haines local traffic:** Traffic on the Haines Highway near the border averaged 188 vehicles a day in 2002. Traffic on the highway on the Haines side of Klukwan averaged 637 vehicles daily.
- **Skagway local traffic:** Traffic on the Klondike Highway just outside of Skagway, between the Dyea turn-off and Sanitorium Road averaged 600 vehicles per day in 2002. Traffic near the border averaged 343 vehicles daily.
- **Juneau local traffic:** At its busiest point, Egan Drive traffic averaged 26,800 vehicles per day in 2002. Traffic on the Douglas Bridge averaged 13,600 vehicles daily. Traffic at the end of Glacier Highway averaged 213 vehicles. The 500 AADT predicted for an East Lynn Canal Highway is approximately equal to current traffic on Glacier highway in the area of the Amalga Harbor turn-off or traffic near the end of Thane Road.
- **Klondike Highway at the Border:** In 2002, traffic averaged 246 vehicles per day, with average summer traffic of 482 vehicles per day.
- **Haines Highway at the Border:** In 2002, traffic averaged 117 vehicles per day, with average summer traffic of 194 vehicles per day.

Summary Discussion

The study team considers the traffic forecasts for the East Lynn Canal Alternatives 2 and 2C, at 510 and 410 AADT, respectively, in 2008, as conservative estimates. The forecasts include conservative interpretation of results from the Juneau, Haines, Skagway and Whitehorse resident surveys. Research on comparable highway links, such as Prince Rupert's Yellowhead Highway, suggest the results found in this study may be conservative. Prince Rupert, a community less than half Juneau's size, generates average daily traffic 1,200 vehicles. Similarly, a community one-seventh the size of Juneau, Valdez, generates daily traffic of 475 vehicles, only slightly less than is predicted for the East Lynn Canal Highway after it would open. The point is that even with liberal assumptions about household and commercial travel, forecasts of this nature probably fail to fully capture how improved transportation between communities can lead to a very significant increase in social, cultural and economic interaction.

¹⁷ Source: BC Ministry of Transportation.

While traffic forecasts for Alternatives 2 and 2C may be conservative, forecasts for the marine alternatives may be slightly over-stated. Though frequency delay cost is one tool used to quantify the role of convenience and freedom to travel in traffic models, it is still difficult to fully incorporate into any traffic forecasting model the effect of relatively infrequent, and sometimes inconvenient ferry service on people's interest in traveling.

Comparison with Traffic Forecasts Prepared for 1997 DEIS

The traffic forecasts calculated in this study are lower than those prepared in 1996 for the 1997 Juneau Access DEIS. For example, the earlier study predicted East Lynn Canal Highway traffic at 618 AADT at start-up in 2005. This study predicts 510 AADT at start-up in 2008. Further, the 1997 EIS predicted traffic of 918 AADT in 2025, while this study predicts 930 AADT by 2038.

Though different methodologies were used, a couple of key factors account for the different traffic estimates. The most important concerns non-resident visitor traffic. Prior to the 1996 report, Alaska's independent highway visitor market had been growing rapidly, at about 6 percent annually. The same rate of growth was assumed through 2000, and a 3 percent growth rate to 2005. The result was visitor-related traffic forecast for 2005 on the East Lynn Canal Highway of over 230 AADT. In fact, Alaska's independent highway market has been declining steadily since about 1997 or 1998. This study assumes non-resident market traffic of about 150 AADT (including Yukon residents).

One other difference between the two studies is worth noting. The 1996 forecast does not necessarily reflect through traffic. For example, East Lynn Highway traffic in the 1996 study includes 30 AADT between the Kensington Mine and Juneau. This forecast considers only through traffic and therefore does not count mine-related commuter traffic (also, mining employment in the area is expected to total about 230 workers, rather than the 430 assumed in the 1997 report).

Both studies assumed an overall 2 percent annual growth rate over the respective forecast periods, for an East Lynn Canal highway.

Ferry Link Traffic Forecasts

In this section, traffic on each ferry link for each Juneau Access alternative is summarized. These estimates are required for the design and sizing of ferries for each Juneau Access marine segment. Ferry traffic includes traffic moving between Juneau and Haines/Skagway plus, where applicable, traffic moving only between Haines and Skagway. Data on traffic moving between Haines and Skagway is taken from the *Haines/Skagway Reconnaissance Study Traffic Forecast*.

Table 18 summarizes Lynn Canal traffic in 2038 (traffic moving between Juneau and Haines/Skagway) requiring ferry service.

Table 18
Juneau Access Traffic to Haines and Skagway, 2038
(with ferry traffic components in italics)

	2038 AADT	# to/through Haines	# to/through Skagway
2 - East Lynn Highway	929	<i>409</i>	520
2A - East Lynn Highway	<i>675</i>	<i>297</i>	378
2B - East Lynn Highway	671	<i>335</i>	<i>335</i>
2C - East Lynn Highway	731	<i>219</i>	731
3 - West Lynn Highway	<i>530</i>	530	<i>159</i>
4A - FVF Auke Bay	<i>222</i>	<i>122</i>	<i>100</i>
4B - FVF Sawmill Cove	<i>267</i>	<i>147</i>	<i>120</i>
4C - Dayboat Auke Bay	<i>149</i>	<i>82</i>	<i>67</i>
4D - Dayboat Sawmill Cove	<i>198</i>	<i>109</i>	<i>89</i>

Source: Juneau Access Traffic Forecast, 2004

As described in the *Haines/Skagway Reconnaissance Study Traffic Forecast*, for the No Action alternative and other all-marine alternatives, Haines/Skagway traffic is predicted at 55 AADT in 2038. This represents total Haines/Skagway shuttle ferry traffic. For the highway alternatives, Haines/Skagway traffic is predicted at 78 AADT. Total north Lynn Canal shuttle ferry traffic (including Haines/Skagway, Katzehin/Haines, Katzehin/Skagway shuttle ferry traffic), includes the 78 AADT moving between Haines and Skagway and Lynn Canal corridor traffic shown in Table 18. For example, total 2038 traffic on the Katzehin/Haines shuttle ferry would be the 409 AADT shown in Table 18 and the 78 AADT in Haines/Skagway traffic, for a total of 487 AADT.

The following tables summarize ferry traffic on all Juneau Access alternatives. Traffic predictions are for 2038, in terms of AADT and SADT.

**Table 19
Juneau Access Ferry Traffic Forecasts, 2038**

	2038 Ferry Traffic AADT						
	Hns-Skg	Ktz-Hns	Ktz-Skg	Jno-Hns	Jno-Skg	Saw-Whb	Saw-Slc
1 - No Build	55						
2 - East Lynn Highway		487					
2A - East Lynn Highway		375					675
2B - East Lynn Highway	78	335	335				
2C - East Lynn Highway	298						
3 - West Lynn Highway	237					530	
4A - FVF Auke Bay	55			122	100		
4B - FVF Sawmill Cove	55			147	120		
4C - Dayboat Auke Bay	55			82	67		
4D - Dayboat Sawmill Cove	55			109	89		

	2038 Ferry Traffic SADT						
	Hns-Skg	Ktz-Hns	Ktz-Skg	Jno-Hns	Jno-Skg	Saw-Whb	Saw-Slc
1 - No Build	98						
2 - East Lynn Highway		861					
2A - East Lynn Highway		664					1,194
2B - East Lynn Highway	138	594	594				
2C - East Lynn Highway	527						
3 - West Lynn Highway	420					938	
4A - FVF Auke Bay	98			216	177		
4B - FVF Sawmill Cove	98			260	213		
4C - Dayboat Auke Bay	98			145	118		
4D - Dayboat Sawmill Cove	98			193	158		

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APPENDICES

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Haines/Skagway Traffic Splits

Alternative	2008 AADT	2038 AADT	2008 AADT		% to/thru Haines	% to/thru Skagway	2038 AADT	
			# to/thru Haines	# to/thru Skagway			# to/thru Haines	# to/thru Skagway
			2 - East Lynn Highway	513			929	226
2A - East Lynn Highway	385	675	170	216	44%	56%	297	378
2B - East Lynn Highway	383	671	192	192	50%	50%	335	335
2C - East Lynn Highway	414	731	124	414	30%	100%	219	731
3 - West Lynn Highway	313	530	313	94	100%	30%	530	159
4A - FVF Auke Bay	140	222	77	63	55%	45%	122	100
4B - FVF Sawmill Cove	165	267	91	74	55%	45%	147	120
4C - Dayboat Auke Bay	103	149	56	46	55%	45%	82	67
ID - Dayboat Sawmill Cove	130	198	72	59	55%	45%	109	89

Seasonal Splits -2008

	to/thru Haines				to/thru Skagway			
	AADT	SADT	WADT	PWADT	AADT	SADT	WADT	PWADT
2 - East Lynn Highway	226	399	104	790	287	508	133	1006
2A - East Lynn Highway	170	300	78	594	216	382	100	756
2B - East Lynn Highway	192	339	89	672	192	339	89	672
2C - East Lynn Highway	124	220	58	435	414	733	192	1451
3 - West Lynn Highway	313	553	145	1096	94	166	43	329
4A - FVF Auke Bay	77	137	36	271	63	112	29	221
4B - FVF Sawmill Cove	91	161	42	318	74	131	34	260
4C - Dayboat Auke Bay	56	100	26	198	46	82	21	162
ID - Dayboat Sawmill Cove	72	127	33	251	59	104	27	205

Seasonal Splits -2038

	to/thru Haines				to/thru Skagway			
	AADT	SADT	WADT	PWADT	AADT	SADT	WADT	PWADT
2 - East Lynn Highway	409	723	189	1431	520	920	241	1822
2A - East Lynn Highway	297	525	137	1040	378	669	175	1324
2B - East Lynn Highway	335	594	155	1175	335	594	155	1175
2C - East Lynn Highway	219	388	102	769	731	1294	338	2562
3 - West Lynn Highway	530	938	245	1857	159	281	74	557
4A - FVF Auke Bay	122	216	57	428	100	177	46	350
4B - FVF Sawmill Cove	147	260	68	515	120	213	56	421
4C - Dayboat Auke Bay	82	145	38	286	67	118	31	234
ID - Dayboat Sawmill Cove	109	193	50	382	89	158	41	312

**Vehicle Type
2008**

Lynn Canal

	AADT			SADT			WADT			PWADT		
	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck
2 - East Lynn Highway	487	10	15	868	23	16	221	2	13	1719	45	32
2A - East Lynn Highway	366	8	11	653	17	12	166	1	10	1292	34	24
2B - East Lynn Highway	364	8	11	650	17	12	165	1	10	1286	34	24
2C - East Lynn Highway	393	8	12	702	18	13	179	1	11	1389	36	26
3 - West Lynn Highway	297	6	9	530	14	10	135	1	8	1048	27	20
4A - FVF Auke Bay	133	3	4	238	6	4	61	0	4	471	12	9
4B - FVF Sawmill Cove	157	3	5	280	7	5	71	1	4	553	14	10
4C - Dayboat Auke Bay	97	2	3	174	5	3	44	0	3	344	9	6
ID - Dayboat Sawmill Cove	124	3	4	221	6	4	56	0	3	437	11	8

to/thru Haines

	AADT			SADT			WADT			PWADT		
	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck
2 - East Lynn Highway	214	5	6	382	10	7	97	1	6	756	20	14
2A - East Lynn Highway	161	3	5	287	8	5	73	1	4	569	15	11
2B - East Lynn Highway	182	4	5	325	8	6	83	1	5	643	17	12
2C - East Lynn Highway	118	2	4	210	5	4	54	0	3	417	11	8
3 - West Lynn Highway	297	6	9	530	14	10	135	1	8	1048	27	20
4A - FVF Auke Bay	73	2	2	131	3	2	33	0	2	259	7	5
4B - FVF Sawmill Cove	86	2	3	154	4	3	39	0	2	304	8	6
4C - Dayboat Auke Bay	54	1	2	96	2	2	24	0	1	189	5	4
ID - Dayboat Sawmill Cove	68	1	2	121	3	2	31	0	2	240	6	5

to/thru Skagway

	AADT			SADT			WADT			PWADT		
	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck
2 - East Lynn Highway	273	6	8	486	13	9	124	1	8	962	25	18
2A - East Lynn Highway	205	4	6	366	10	7	93	1	6	724	19	14
2B - East Lynn Highway	182	4	5	325	8	6	83	1	5	643	17	12
2C - East Lynn Highway	393	8	12	702	18	13	179	1	11	1389	36	26
3 - West Lynn Highway	89	2	3	159	4	3	40	0	2	315	8	6
4A - FVF Auke Bay	60	1	2	107	3	2	27	0	2	212	6	4
4B - FVF Sawmill Cove	71	1	2	126	3	2	32	0	2	249	7	5
4C - Dayboat Auke Bay	44	1	1	78	2	1	20	0	1	155	4	3
ID - Dayboat Sawmill Cove	56	1	2	99	3	2	25	0	2	196	5	4

**Vehicle Type
2038**

Lynn Canal

	AADT			SADT			WADT			PWADT		
	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck
2 - East Lynn Highway	882	19	26	1573	41	30	400	3	24	3113	81	59
2A - East Lynn Highway	641	13	19	1143	30	21	291	2	18	2262	59	43
2B - East Lynn Highway	637	13	19	1136	30	21	289	2	18	2249	59	42
2C - East Lynn Highway	695	15	21	1239	32	23	315	2	19	2452	64	46
3 - West Lynn Highway	503	11	15	898	23	17	228	2	14	1777	46	33
4A - FVF Auke Bay	211	4	6	376	10	7	96	1	6	744	19	14
4B - FVF Sawmill Cove	254	5	8	453	12	9	115	1	7	896	23	17
4C - Dayboat Auke Bay	141	3	4	252	7	5	64	0	4	498	13	9
ID - Dayboat Sawmill Cove	188	4	6	336	9	6	85	1	5	664	17	12

to/thru Haines

	AADT			SADT			WADT			PWADT		
	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck
2 - East Lynn Highway	388	8	12	692	18	13	176	1	11	1370	36	26
2A - East Lynn Highway	282	6	8	503	13	9	128	1	8	995	26	19
2B - East Lynn Highway	319	7	10	568	15	11	145	1	9	1124	29	21
2C - East Lynn Highway	208	4	6	372	10	7	95	1	6	736	19	14
3 - West Lynn Highway	503	11	15	898	23	17	228	2	14	1777	46	33
4A - FVF Auke Bay	116	2	3	207	5	4	53	0	3	409	11	8
4B - FVF Sawmill Cove	140	3	4	249	7	5	63	0	4	493	13	9
4C - Dayboat Auke Bay	78	2	2	138	4	3	35	0	2	274	7	5
ID - Dayboat Sawmill Cove	104	2	3	185	5	3	47	0	3	365	10	7

to/thru Skagway

	AADT			SADT			WADT			PWADT		
	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck	PV	RV	Truck
2 - East Lynn Highway	494	10	15	881	23	17	224	2	14	1743	46	33
2A - East Lynn Highway	359	8	11	640	17	12	163	1	10	1267	33	24
2B - East Lynn Highway	319	7	10	568	15	11	145	1	9	1124	29	21
2C - East Lynn Highway	695	15	21	1239	32	23	315	2	19	2452	64	46
3 - West Lynn Highway	151	3	5	269	7	5	69	0	4	533	14	10
4A - FVF Auke Bay	95	2	3	169	4	3	43	0	3	335	9	6
4B - FVF Sawmill Cove	114	2	3	204	5	4	52	0	3	403	11	8
4C - Dayboat Auke Bay	63	1	2	113	3	2	29	0	2	224	6	4
ID - Dayboat Sawmill Cove	85	2	3	151	4	3	38	0	2	299	8	6

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