

Port of Haines: Potential for Development

Prepared for

Haines Borough

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Prepared by



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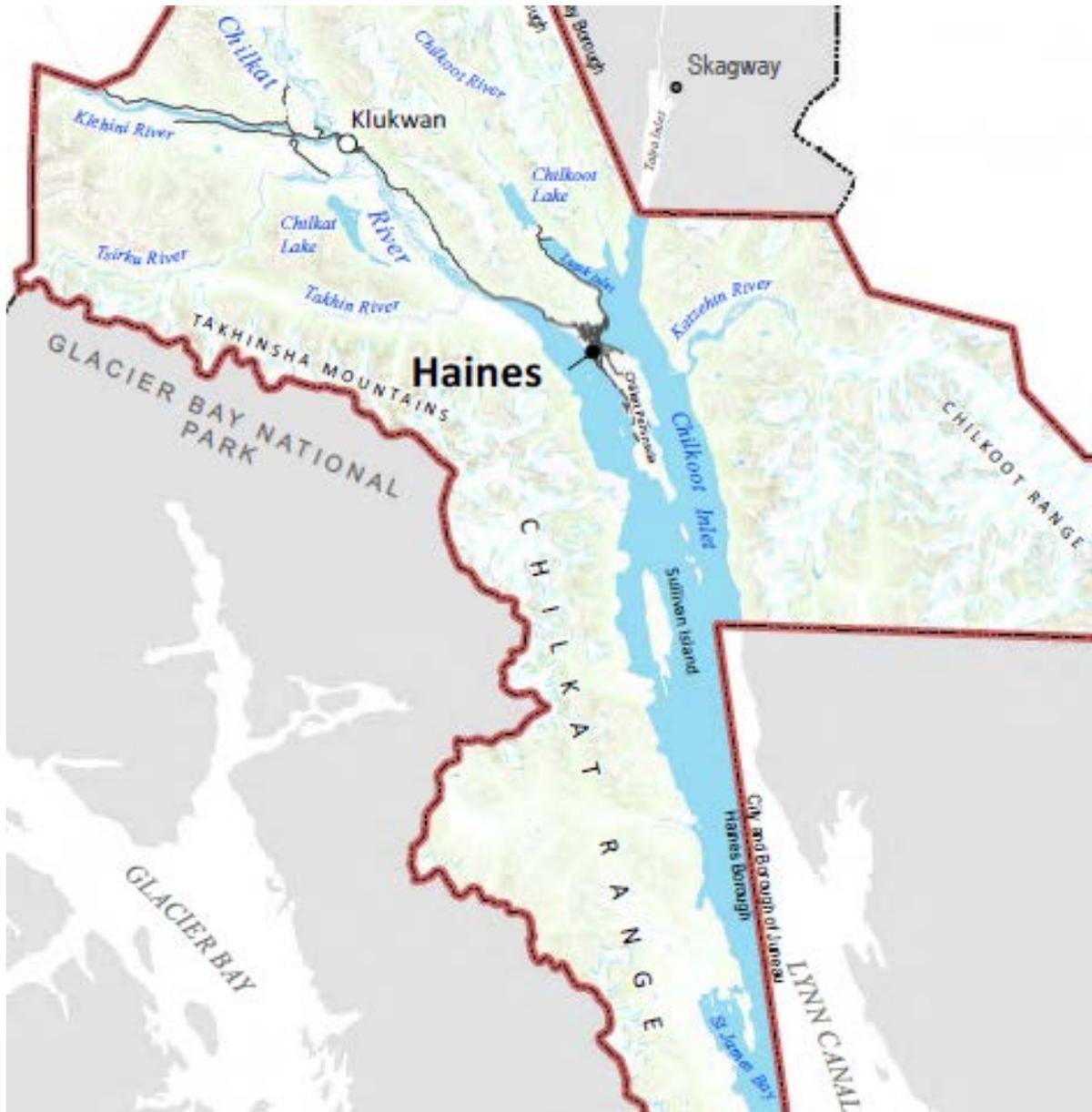
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1 Introduction

Haines is located between the Chilkoot and Chilkat rivers on Chilkoot Inlet, approximately 150 road miles south of Haines Junction and at the end of the Haines Highway (Figure 1). It has a maritime climate, with temperatures ranging from 10°F to 70°F, and is accessible by water, road, and air (DCCED 2012). The moderate climate, ice-free deep-water port, and year-round road access are advantageous, and support the borough's role as a local transportation hub.

Figure 1. Haines Borough General Location Map



Source: Adapted from Haines Borough 2012a

Going forward, the Haines Port Development Plan Steering Committee (the Committee) aims to expand the community's regional transportation role by targeting industries with activities and cargo for which the Port of Haines has a competitive advantage. This report is an overview of potential advantages and cargo volumes at Haines, and is intended to assist the Committee in making an informed decision as to whether they should proceed further in evaluation of port expansion or improvement.

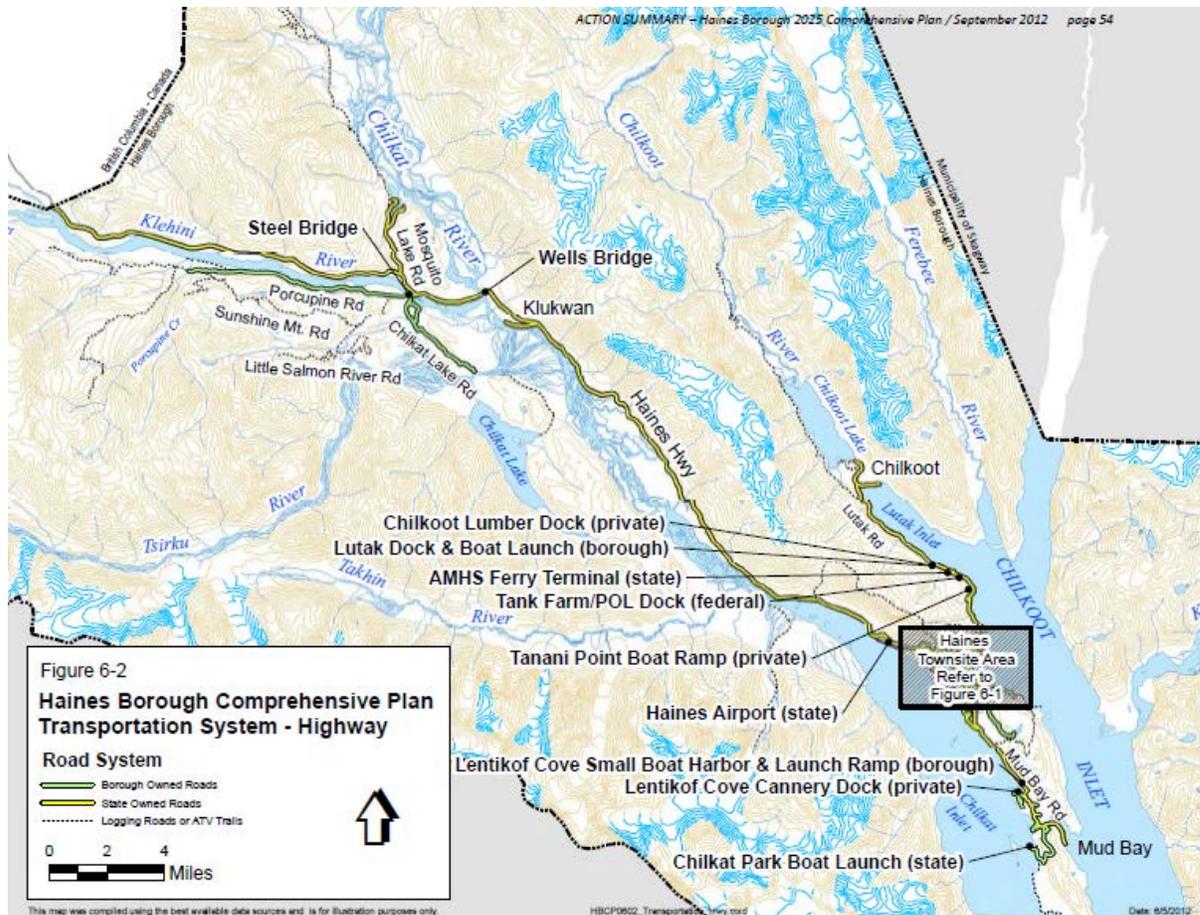
The report is divided into three sections: facility comparison, transportation assessment, and market assessment. The facility comparison describes the features, current uses, and ownership of facilities in Haines, and compares them to facilities in Skagway and Valdez. The transportation assessment also compares Haines to its nearest port competitors, Skagway and Valdez, highlighting cost advantages and disadvantages of each resulting from distance and road restrictions. The market analysis looks at local, regional, and industry specific factors which could generate cargo volumes for the port of Haines.

2 Facility Comparison

2.1 Transportation Facilities in Haines

Haines has a system of transportation facilities that accommodate movement of passengers and freight via land, air, and water. As shown in Figure 2, the borough is connected to the state highway system, has a state-owned airport, and boasts a variety of waterfront facilities.

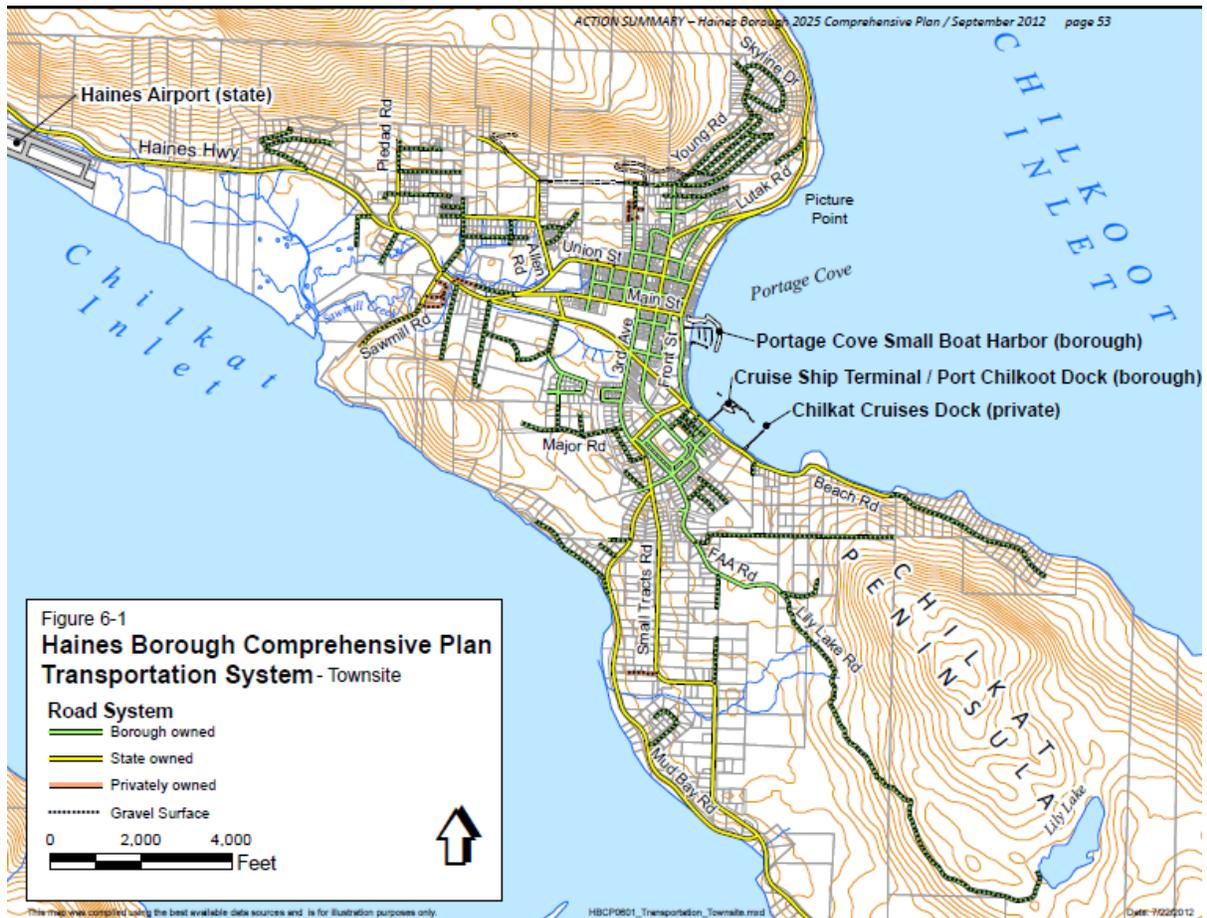
Figure 2. Haines Borough Transportation System



Source: Haines Borough 2012a

Figure 3 is an enhanced view of the facilities near the Haines townsite. The Portage Cove Small Boat Harbor, Chilkat Cruises Dock, and Port Chilkoot Dock¹ (with attached Lightering Dock) are within walking distance of downtown; this is convenient for the recreational and passenger traffic that they accommodate.

Figure 3. Haines Townsite Transportation System



Source: Haines Borough 2012a

2.1.1 Borough-Owned Port and Harbor Facilities

Haines Borough's marine facilities consist of the following:

- Lutak Dock and Boat Launch
- Portage Cove Small Boat Harbor
- Port Chilkoot Dock and its attached Lightering Dock
- Lentikof Cove Small Boat Harbor, launch ramp, and float
- Moorage float at Swanson Harbor

¹ Also referred to as the Cruise Ship Terminal

All facilities, with the exception of the Letnikof Cove and Swanson Harbor facilities, are located in Portage Cove, on the eastern side of the city. Letnikof Cove is located southwest of town on Chilkat Inlet and is used primarily by commercial and sport fishing boats. Swanson Harbor is near Couverden in Lynn Canal (Haines Borough 2012a).

Three of Haines’ marine assets have potential for handling increased industrial cargo volumes; Lutak Dock, Alaska Marine Highway System (AMHS) terminal, and Port Chilkoot Dock can all accommodate vessels with drafts deeper than 23 feet and lengths greater than 500 feet (Table 1).

Table 1. Haines Marine Facilities

Name	Primary Use	Largest Berthing Space (feet)	Depth (feet)
Haines Municipal Dock (Lutak Dock)	Containerized, conventional, & roll-on/roll-off cargo; petroleum products & logs	750	24-33*
AMHS Ferry Terminal	Passenger and vehicular ferries	640	23-25
Port Chilkoot Dock	Petroleum products; mooring cruise vessels.	850	40-46
Portage Cove Harbor	Mooring commercial vessels and recreational craft	30	14
Letnikof Cove Float	Mooring commercial vessels and recreational craft	252	40

Note: * Haines’ Harbormaster has seen these depths reported in surveys.

Source: Marine Exchange of Alaska 2012a; Benner 2012

AMHS Terminal and Lutak Dock

The AMHS Terminal and Lutak Dock (Figure 4 and Figure 5) are located near the mouth of Lutak Inlet, roughly four miles north of Haines. Ownership of the docks shown in Figure 4 and Figure 6 are split; the borough owns 75 percent of the dock and the State of Alaska owns the remaining 25 percent (the portion used as the AMHS ferry terminal).

Figure 4. Aerial Photo of the AMHS and Lutak Dock



Source: PND Engineers 2009

Figure 5. AMHS and Lutak Dock



Source: Northern Economics 2011

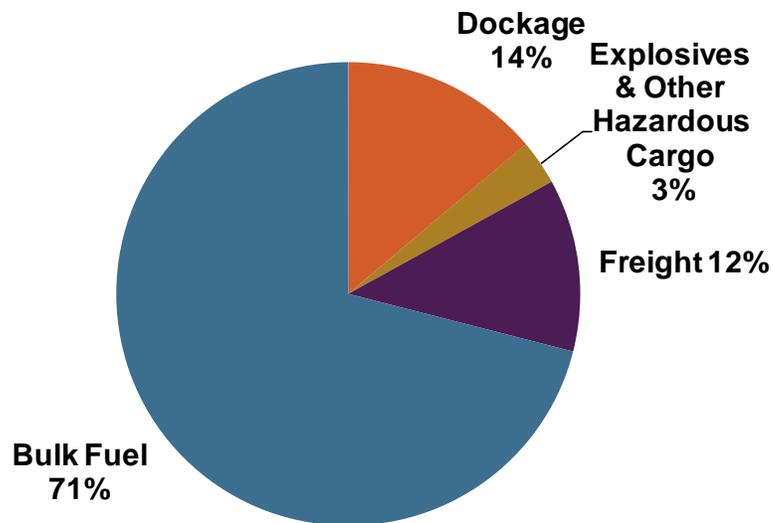
Lutak Dock is Haines' primary industrial facility; it is an ice-free dock that accommodates regularly scheduled shipments of fuel and freight for the borough and surrounding area (Haines Borough Undated).

Originally constructed in 1953 by the U.S. Army Corps of Engineers, Lutak Dock is a closed cell sheet pile dock with a concrete cap along the seaward perimeter of the cells (PND 2010). The dock offers four acres of storage space, 750 feet of berthing space, and has a depth ranging from 24 feet on the north end to 33 feet on the south end (Earnest 2012; Benner 2012). Equipment available at the dock includes one 1-ton and one 1/2-ton electric mast-and-boom, and two 35-ton diesel forklift trucks (Earnest 2012).

According to a marine facilities condition assessment undertaken by PND Engineers in 2010, Lutak Dock is in need of repairs, but the extent and nature of these repairs depend on the intended future use of the facility. Replacement of the exterior concrete cap and enhancement of vertical support features, in addition to regular anode inspections, are recommended if current facility operations are maintained (PND 2010). Operations with an increased load weights would likely require further repairs.

Lutak Dock currently operates year-round and is equipped to handle manual loading and unloading operations for bulk cargo, breakbulk cargo, roll-on roll-off cargo, petroleum products transshipment, and passenger operations (Haines Borough 2012a). The two primary users of Lutak Dock are Alaska Marine Lines (AML) and Delta Western. In 2011, the dock generated approximately \$335,000 in dockage and wharfage revenues (Haines Borough 2012c). Figure 6 shows a breakdown of these revenues.

Figure 6. Lutak Dock Revenues, 2011



Source: Haines Borough 2012c

Fuel shipped through Haines is used locally and sold to Canadian wholesalers (Gray 2012). Fuel shipments accounted for 71 percent of Lutak Dock's revenues in 2011. Non-hazardous freight wharfage fees generated 12 percent of 2011 total revenue. Most freight that moves over the dock originates in Seattle and is destined for Haines businesses and residents; only a small portion is

transported to Anchorage via highway (Ganey 2012). Freight shipment volumes are seasonal, with increases in the summer months resulting from construction projects.

The primary transportation route to and from the facilities utilizes Lutak Road, which runs between the docks and downtown Haines. No bypass road currently exists, so traffic moving between the docks and the Haines Highway must then travel through a residential area via Union Street, which is two blocks north of and parallel to Main Street (Ganey 2012).

A mile or so north of Lutak Dock is the Chilkoot Lumber Company Dock, constructed in 1966. This land is zoned for commercial use, making it a viable option for a Lutak Dock expansion. Federal land begins approximately 1,200 feet south of Lutak Dock and covers the area of Tanani Point (Haines Borough 2012b). The land adjacent to the dock on the west side of Lutak Road is also owned by the borough and houses a tank farm owned by Delta Western Inc. with a capacity of 3.24 million gallons (Haines Borough 2012a).

Port Chilkoot Dock

Port Chilkoot Dock, also referred to as the Cruise Ship Terminal (Figure 7), is located in Portage Cove, northwest of the Chilkat Cruises Dock and south of Portage Cove Small Boat Harbor. It is owned and operated by the Haines Borough and is used primarily for the mooring of cruise vessels. Port Chilkoot Dock is a 900-foot long steel pier dock with berthing space of 850 feet and a depth of 40–46 feet (Alaska Marine Exchange 2012a). A 2010 steel pile inspection by PND Engineers showed that the pilings supporting the dock are in good condition; no significant rust or scale was noted, as well as very little section loss (PND 2010).

Figure 7. Port Chilkoot Dock



Source: Northern Economics 2011

According to the Haines Borough land ownership maps, Port Chilkoot Dock is primarily borough-owned with the northeastern-most tip extending into state-owned territory. As of late, the borough has put forth several efforts to further develop the facility for cruise passenger use. Recent improvements include construction of public restrooms, additional parking, and pedestrian improvements (Haines Borough 2012a).

2.1.2 Available Private Commercial Facilities

Chilkoot Lumber Dock

Located north of Lutak Dock is the Chilkoot Lumber Dock. The dock is privately owned and currently available for sale or lease (Beck 2012). Chilkoot Lumber Dock is a T-shaped facility that extends 180 feet from the shore to the dock face. The dock face is about 560 feet long and 200 feet wide (Figure 8). At Mean Lower Low Water, depth is approximately 35 feet at the eastern end of the dock and more than 60 feet at the western end. While the facility is large enough to accommodate a large ship, the dock's creosote pilings substructure and decking are in need of renovation before a large ship can berth (Beck 2012).

Figure 8. Chilkoot Lumber Dock, Aerial Image



Source: McClane 2007. Used with permission.

In addition to the dock itself, there are approximately 25 acres of uplands available at the former sawmill site (Haines Borough 2012a). The Chilkoot Lumber facility was used for lumber through the 1990s, and has since been used sporadically for log storage, gravel shipments, and fish processing (Beck 2012). Figure 9 shows the dock in its current state; the blue building on the right side of the image is a fish processing facility.

Figure 9. Chilkoot Lumber Dock



Source: Northern Economics 2011

Due to past industrial use of the uplands, facility owners have worked with the Department of Environmental Conservation to manage soil contaminated with hydrocarbons from old machinery. According to property representatives, the clean-up is nearly complete and there is a tentative work plan to finish the environmental work by encapsulating the remaining contaminants so that no institutional controls are left on the property (Beck 2012).

The Chilkoot Lumber Dock site has been cited by Yukon studies as being a potential location of ore short-term transshipment (KPMG 2005). In the past, plans for construction of port facilities and a rail line to Chilkoot Lumber Dock had an estimated a cost of approximately \$6.7 billion (KPMG 2005).

Chilkat Cruises Dock

Chilkat Cruises Dock (Figure 10) is a privately-owned facility located on the southwest shore of Portage Cove. The facility has been for sale for several years and an offer is currently pending. At this time no further details regarding the potential sale are available (Strong 2012). The dock offers approximately 220 feet of berthing space and 30 feet of water depth (Marine Exchange of Alaska 2012a).

Figure 10. Chilkat Cruises Dock



Source: Northern Economics 2011

2.1.3 Other Transportation Facilities

Airport

Haines Airport, a state-owned facility, has a 4,000-foot runway and accommodates regularly scheduled air service for Juneau and other Southeast hubs (Haines Borough 2012a). While the airport currently services an annual volume of 12,000 operations per year, it has the capacity to handle up to 230,000 aircraft landings or takeoffs per year. Its full-length parallel taxiway and system of exit and entrance taxiways allow for simultaneous operation (Alaska Department of Transportation and Public Facilities [ADOT&PF] Undated).

The airport's apron and taxiways are in need of repair due to drainage failures and frost heaving. A major apron reconstruction project is expected to go to bid in fiscal year 2014 (ADOT&PF Undated).

Lutak Road Mile 4.75 and Mile 5

Two privately owned parcels of waterfront property in close proximity to both the AMHS Terminal/Lutak Dock and the Chilkoot Lumber Dock are currently for sale. The first, listed as Lutak Road Mile 4.75, consists of 7.11 acres of vacant land divided into 5.98 acres of uplands and 1.13

acres of tidelands. The second parcel, listed as Lutak Road Mile 5, consists of 15.9 acres of fee simple land adjoining the Chilkoot Lumber Dock.

Petroleum-Oil-Lubricant Dock and Tank Farm

To the south of the AMHS ferry terminal is the Petroleum-Oil-Lubricant dock and former Army Fuel Tank Farm (Figure 11). The dock and tank farm are remnants of the Haines-Fairbanks Pipeline, which the U.S. Army owned and operated from 1955 to 1973. During this time tankers would deliver refined fuel to Haines, which would then be pumped via an eight-inch diameter pipeline to military bases in Fairbanks (Hollinger 2003).

Figure 11. Petroleum-Oil-Lubricant Dock



Source: Northern Economics 2011

The Haines-Fairbanks pipeline was decommissioned in the 1970s, but the dock and tank farm associated with the pipeline still remain (Hollinger 2003). Neither the dock nor the tank farm is currently in use (Culbeck 2012).

The tank farm has been suggested as a site for bulk shipments of coal or iron ore (KPMG 2005). In 2009, Congress authorized conveyance of the tank farm to the Chilkoot Indian Association for the purpose of developing a Deep Sea Port and for other industrial and commercial development purposes (Haines Borough 2012a).

2.2 Ports of Haines, Skagway, and Valdez

The Port of Skagway is a combination of well-developed industrial facilities which cater to cruise vessels, fuel and freight shipments, and ore and concentrates from regional mines. Table 2 summarizes the facilities available at the Port of Skagway.

Table 2. Port of Skagway Facility Description

Name	Primary Use	Berthing Space (ft.)	Depth (ft.)	Mechanical Handling	Storage (sq ft)
White Pass Railroad Dock	Receipt and shipment of petroleum products; mooring cruise vessels.	1,850	36-70	Stevedore rental equipment is available as required.	80,000
Broadway Dock	Mooring Cruise Vessels	800	35	None	--
Ore Dock and Skagway Ore Terminal	Receipt and shipment of petroleum products; mooring cruise vessels.	1,200	45-50	64,000 lb. GVW vehicle ramp, 1,000 ton/hour loading spout	120,000
AML Barge Dock	Receipt and shipment of conventional, containerized, and roll-on/roll-off general cargo.	411	40	100 ton GVW pass-pass capabilities with two large forklifts of 30 and 45 ton lifting capacity	102,000
Ferry/City Dock	Containerized & roll-on/roll-off cargo; landing for passenger & vehicular ferry; fueling vessels	385	25	2 ton harbor crane	120,000
Small Boat Harbor	Stalls for pleasure craft, fishing vessels and tugs	40	15	None	--

Source: Municipality of Skagway & Marine Exchange of Alaska, & U.S. Army Corps of Engineers

In contrast to the Port of Skagway, the Port of Valdez has only three major facilities (not including the privately operated crude and fuel facilities at Alyeska). As shown in Table 3, the Valdez Container Terminal is the largest of the three.

Table 3. Port of Valdez Facility Description

Name	Primary Use	Largest Berthing Space (ft.)	Depth (ft.)	Mechanical Handling	Storage
Valdez Container Terminal	General and Containerized Cargo	1,200	50	One 150-ton crane, three 100-ton cranes, and forklifts	525,000-bushel-capacity grain elevator with nine concrete silos
Municipal Dock	mooring of vessels	600	26	One 1 1/2-ton electric-hydraulic derrick; five 2-ton forklift trucks	
Petroleum Dock	Shipment of petroleum products	275	30-36	None	Storage Tanks: 176,225 bbl

Source: City of Valdez and Marine Exchange of Alaska, & U.S. Army Corps of Engineers

Table 4 summarizes the facilities and equipment at the docks most likely to accommodate mining shipments at the Port of Haines, Skagway, and Valdez. As shown in the table, Lutak and Port Chilkoot Docks have the least berthing space and shallowest depths when compared to facilities at the other two ports.

Table 4. Haines, Skagway and Valdez Facility Comparison

Facility Name	Dock Name	Primary Use	Total Berthing Space (feet)	Depth (feet)
Port of Haines	Lutak Dock	Containerized, conventional, and roll-on/roll-off cargo; petroleum products; and logs	750	24-33
	Chilkoot Lumber Dock	Log storage, gravel shipments, and fish processing	560	35-60
	Port Chilkoot Dock	Mooring cruise vessels	850	40-46
Port of Skagway	Ore Dock	Receipt and shipment of petroleum products and mined materials; mooring cruise vessels.	1,200	40-50
Port of Valdez	Valdez Container Terminal	General and Containerized Cargo	1,200	50

Source: Marine Exchange of Alaska 2012a & U.S. Army Corps of Engineers

Lutak Dock, used for petroleum and freight transfer, has pipelines which extend to inland storage tanks, as well as four acres of open storage (Marine Exchange of Alaska 2012a). Chilkoot Lumber Dock, used for log storage, gravel shipments, and fish processing, has 25-acres of uplands available at the former sawmill site (Haines Borough 2012a and Beck 2012).

At Skagway, the Ore Dock has a 64,000-pound (29,000 kg) GVW vehicle ramp, 1,000-ton (907 tonnes)-per-hour loading spout, and dockside fuel headers. The terminal also offers 120,000 square feet of open storage adjacent to the Ore Dock (Skagway Development Corporation 2012). According to a Prolog Canada report (undated), the Ore Dock currently exports 85,000 tonnes per year, though it has historically exported 600,000 tonnes annually and could potentially be expanded to handle in excess of 1 million tonnes annually. While the facility could conceivably handle more than 12 times the current quantity of ore exports, if several large Yukon mines were to open it could reach capacity, which would lead to increased demand for facilities in Haines as the next nearest port.

The Valdez Container Terminal offers 21 acres of open storage, as well as cranes (100–150 ton) and grain silos (Marine Exchange of Alaska 2012b).

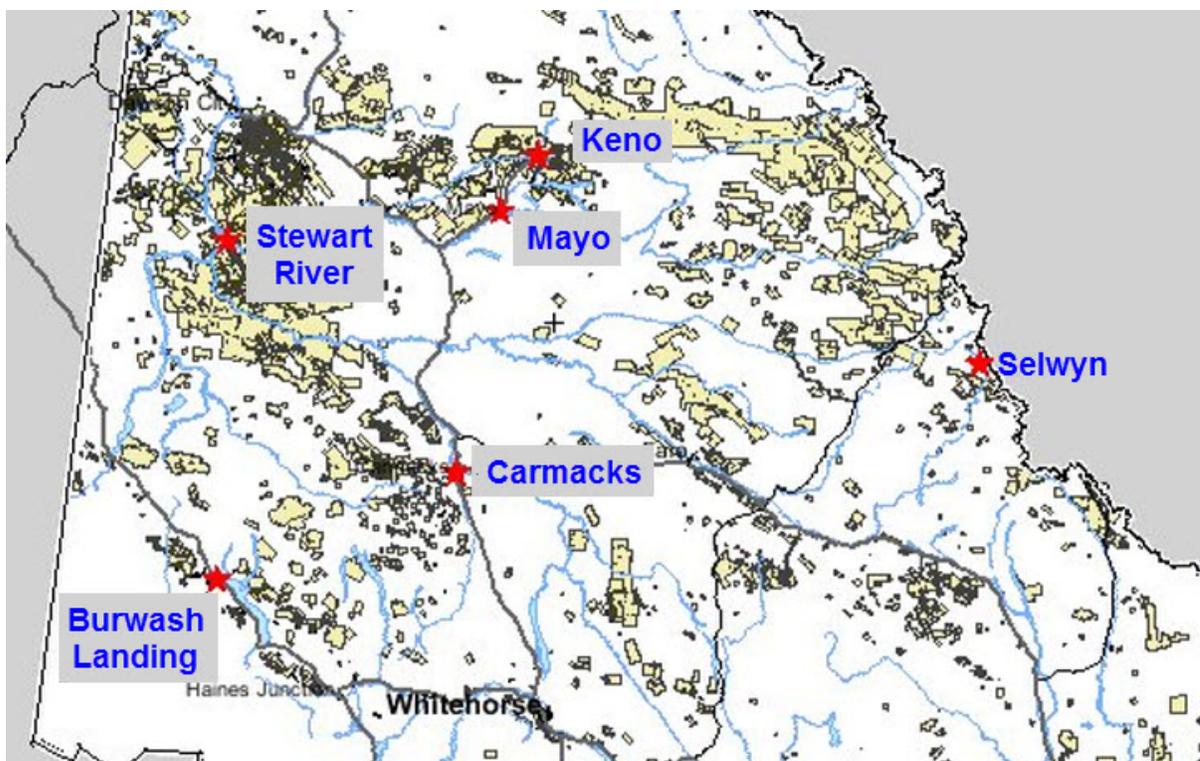
3 Transportation Assessment

In this section, we assess Haines’s transportation advantages and disadvantages relative to its geographic competitors, the Port of Valdez and the Port of Skagway. Estimates of surface transportation costs resulting from the use of the Port of Haines relative to its competitors are made using distance and per-unit cost estimates sourced from both publicly-available resources and quotes from local service providers. Additionally, the section provides a description of each port and a comparison of major attributes, furthering the assessment of Haines’ strengths and weaknesses relative to its regional competitors.

3.1 Highway Distance Advantage

Yukon is home to several mining prospects in various stages of development. Figure 12 illustrates those mines which Government of Yukon believes will be developed within the next five to ten years (Stephens 2012). Each of the mines is located in Yukon and is within driving distance to Haines via seasonal or year-round access roads.

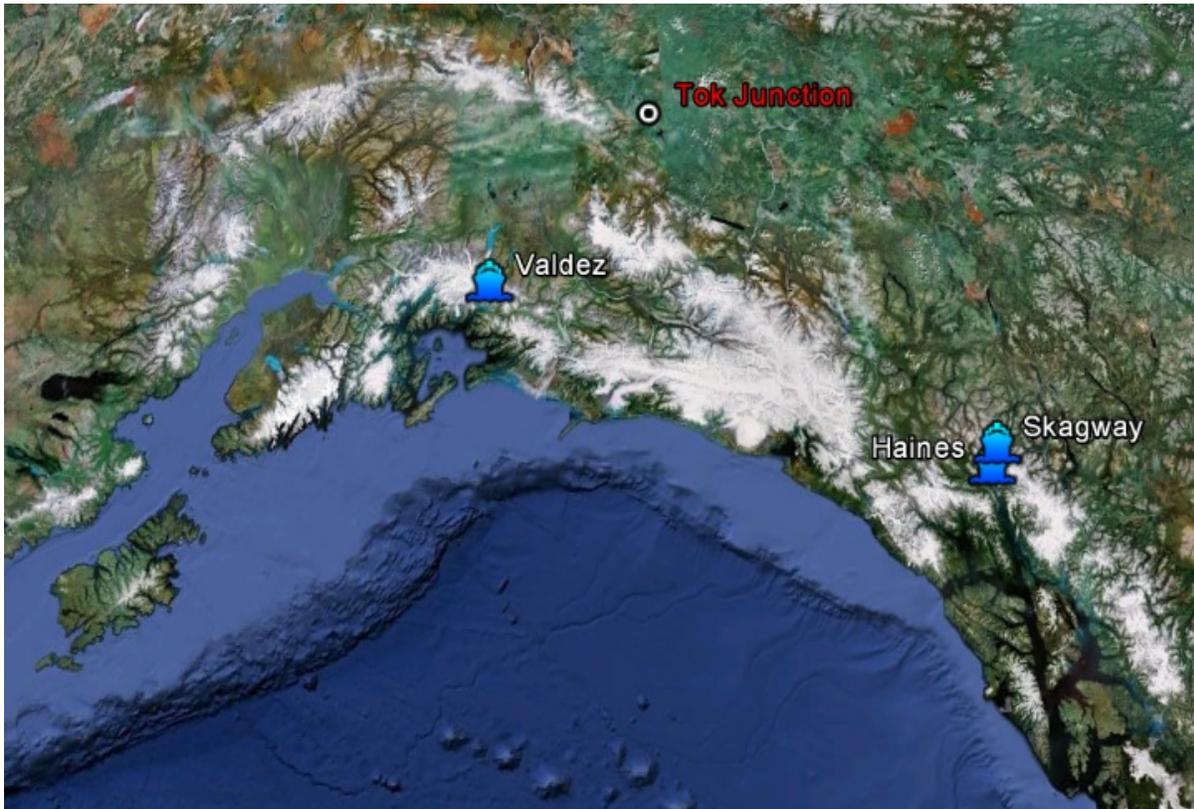
Figure 12. Mining Development Prospects in Relation to Known Mineral Deposits



Source: Northern Economics, Inc. adapted from Government of Yukon, 2012

Haines, Valdez, and Skagway are the only Alaskan ports accessible by road that are within a reasonable driving distance of Yukon. Haines is located between Valdez to the east and Skagway to the west. The Port of Haines competes for transportation advantage with both (Figure 13).

Figure 13. Map of Haines Relative to Skagway and Valdez



Source: Google Earth 2012

Beginning at the community of Tok, the study team compared distances between various origin points along the Alaska Highway and both Haines and Valdez. Table 5 summarizes the results, with shaded cells indicating the shorter of the two distances. The last column shows the travel cost savings (or expenses) incurred by using Haines rather than Valdez.

Table 5. Transportation Distance in Miles for Communities on the Alaska Highway, Haines versus Valdez

Origin	Distance to Destination (Miles)		Difference in Miles	Travel Cost Savings (\$)
	Haines	Valdez		
Tok	442	255	187	-765
Tetlin Junction	426	267	159	-650
Northway Junction	400	310	90	-367
Beaver Creek	340	364	23	95

Note: Assumes operating cost of \$4.08 per mile

Source: Microsoft Trips and Streets (2011), Freight Metrics 2012 and Northern Economics, Inc. analysis

The point along the Alaska Highway where Haines has a transportation cost advantage over Valdez is at Beaver Creek. Cargo (such as mining material) which begins traveling along the Alaska Highway at Beaver Creek and south will likely access tidewater in Haines. Cargo which comes onto the highway north of Beaver Creek is likely to access tidewater in Valdez. This transition point is reinforced by the U.S.-Canadian border, which is located just north of Beaver Creek. In addition to the mileage

calculation, shipments originating in Alaska are less likely to cross the border due to additional administrative burden of moving between countries when a suitable export port is available entirely within the state.

Table 6 is similar to Table 5, but shows the relative distances between Haines and Skagway for communities along the Alaska Highway and the Klondike Highway. The transportation savings between Haines and Skagway is more apparent based on route. For all points along the Klondike Highway, Skagway has the cost advantage. For all points along the Alaska Highway west of Whitehorse, Haines has the cost advantage.

Table 6. Transportation Distance in Miles, Haines vs. Skagway

Origin	Distance to Destination (Miles)		Difference in Miles	Travel Cost Savings (\$)
	Haines	Skagway		
Klondike Highway				
Keno	513	395	118	-483
Mayo	476	358	118	-483
Carmacks	337	219	118	-483
Whitehorse	244	109	135	-552
Alaska Highway				
Koidern	295	351	56	229
Burwash Landing	224	280	56	229
Destruction Bay	213	269	56	229
Haines Junction	148	204	56	229

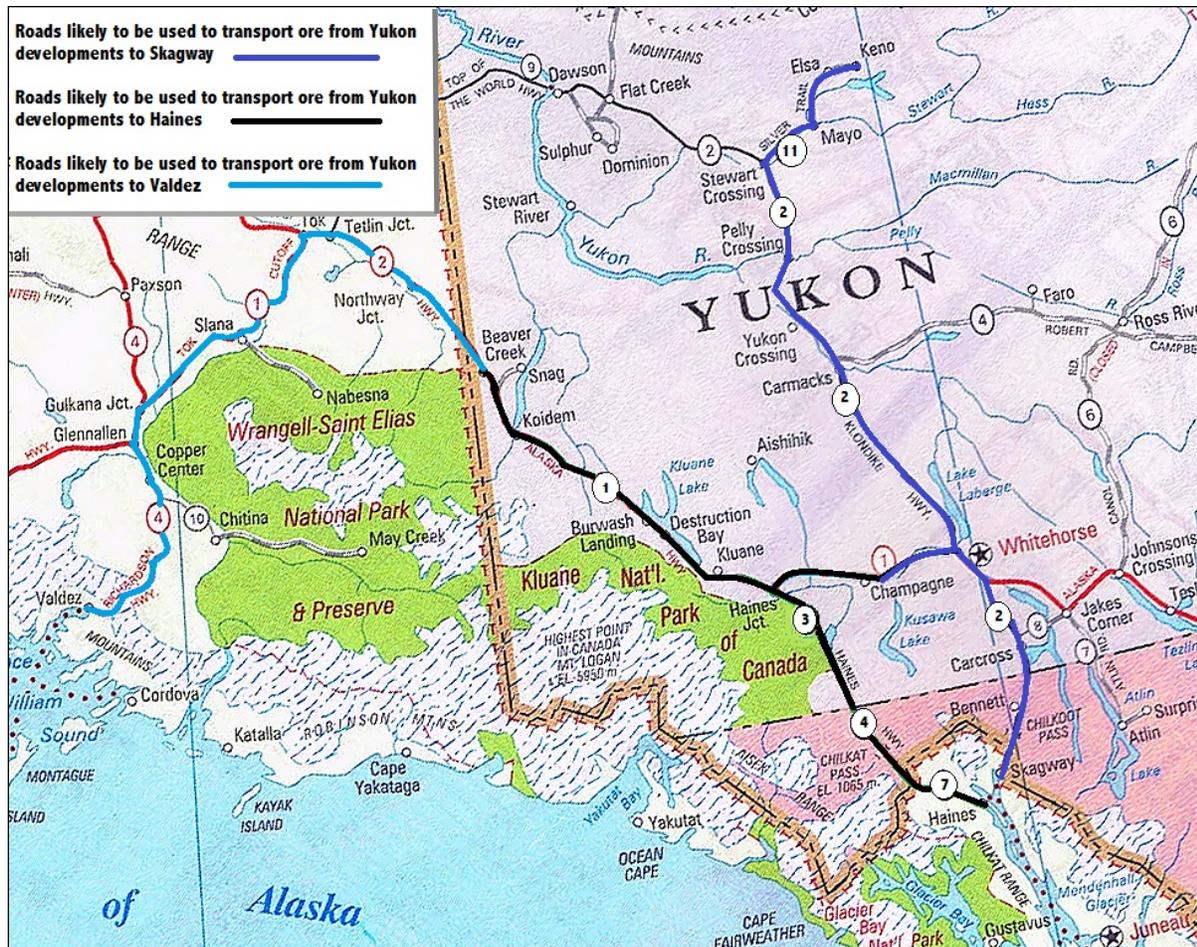
Note: Assumes operating cost of \$4.08 per mile

Source: Microsoft Trips and Streets (2011), Freight Metrics 2012 and Northern Economics, Inc. analysis

With regard to ore shipments, the difference in relative cost means that mining developments occurring in Yukon which have access roads connecting to the Klondike Highway are likely to make Skagway their port of choice as the distance of travel is significantly shorter than it would be to travel to Haines. Conversely, mining developments with access roads connecting to the Alaska Highway north of Haines Junction are more likely to make Haines their port of choice.

Figure 14 summarizes the results shown in Table 5 and Table 6. The black line indicates the route and locations along the Alaska Highway which have a transportation cost advantage by using Haines.

Figure 14. Transportation Routes from Selected Points to Valdez, Haines, and Skagway²



Source: Northern Economics, Inc. adapted from AAA 2012

3.2 Load Limits

In addition to distance, road load-bearing capacity could influence a mine developer's decision of whether to export ore and concentrates through Skagway or Haines. According to a recent draft of a forthcoming ADOT&PF report on mine-related traffic to ports in Southeast Alaska, "In 1986, Alaska upgraded its portion of the Klondike Highway to accommodate the year-round movement of mineral concentrates from mines in Yukon and British Columbia" (Dye Management Group 2012). The road accommodates oversize and overweight loads up to 170,000 lbs gross vehicle weight (GVW), the maximum allowed on the Canadian portions of the highway (Dye Management Group 2012).

² Please note that this analysis takes into account road distance only. When the study team compares routes, it traditionally takes into account the speed of travel on particular roads. However, in this instance, the limited road network shown in Figure 2 does not offer road users reasonable alternatives, making travel time an insignificant variable when making a port choice.

Vehicles with overweight permits on Alaska roads are not limited to a specific GVW, however, they must comply with ADOT&PF permitting and bridge formula limit requirements (Cargo Agents Network 2012). ADOT&PF is currently designing a highway reconstruction project which will impact the Haines Highway and regional bridges. Construction is tentatively planned to begin in 2014, though delays due to environmental permitting are expected. Improvements include bridge expansions and enlargement of paved shoulders from two feet to six feet in width (ADOT&PF 2012). The improvements are not expected to increase legal load limits. While Haines might benefit from an increased weight limit on its roads, it should be noted that the state or borough would need to identify funds available for the upgrade. As noted by ADOT&PF (2012), “The Federal Highway Administration funds highway construction to meet legal load requirements; any cost for construction in excess of legal load requirements must be borne by the state and/or the user.” In Skagway, the additional road construction costs were funded through permit surcharges levied on overweight and oversize cargos. At this time the study team is not aware of sources of consistent and frequent demand for cargo transportation through the Port of Haines that cannot comply with current ADOT&PF road restrictions. With few permits issued, the state would need to seek other sources of funding for the upgrades.

3.3 Bridge Restrictions

During interviews with local businesses and mining representatives, the study team was told that while Skagway’s road has a weight-bearing advantage relative to the Haines Highway, Haines is preferable for moving large pieces of equipment. It was implied that the bridges outside of Haines are capable of handling equipment larger than those out of Skagway. As shown in Table 7, however, the available data regarding bridges outside of both communities show otherwise. The Chilkat River Bridge is the current³ chokepoint on the Haines Highway as its width is only 24 feet. While the Skagway Ferry Terminal Bridge is narrower, at 17 feet, most cargo shipments in and out of Skagway do not need to cross this bridge. It is likely that the Haines Highway is preferable for moving equipment not because it has larger bridges, but rather because it has a lower highway grade (Dischner Undated).

Table 7. Bridge Comparison, Haines and Skagway

Route	Bridge Name	CDS Mile Point	Historic Mile Post	Bridge Number	Length (ft)	Width (ft)
Route to Haines: Canadian Boarder to Haines Highway	Chilkat River	23.2	23.8	0742	504	24.0
	Muncaster Creek	28.3	28.9	0743	60	36.0
	Little Boulder Creek	31.0	31.6	0744	80	36.4
	Big Boulder Creek	33.2	33.8	0745	120	36.1
Route to Skagway: Canadian Boarder to (U.S.) Klondike Highway	Skagway Ferry Terminal	0.0	0.0	0805	175	17.0
	Skagway River	1.8	1.2	0308	482	28.0
	Captain Wm Moore Creek	11.2	10.4	1304	300	28.0

Source: ADOT&PF 2009

³ The bridge is expected to be enlarged as part of the 2010-2013 State Transportation Improvement Program.

Preference for Haines may increase with upcoming bridge improvements. ADOT&PF is currently designing an expansion of the Chilkat River Bridge; the improvements will increase load capacity by 1/3, and will expand the bridge width from 24 feet to 36 feet (ADOT&PF 2012).

3.4 Marine Cost Advantage

Haines and Skagway are both located on Chilkoot Inlet, approximately 80 and 90 miles northeast of Juneau, respectively. Valdez is located on the north shore of Port Valdez in the Prince William Sound, approximately 305 road miles east of Anchorage. All three ports are ice-free, deep-water ports that are accessible by land, sea, and air year-round (DCCED 2012).

Puget Sound is the primary gateway to Alaska, and the Port of Seattle is a frequent origin and destination for cargo moving through Haines, Skagway, and Valdez. Seattle is a major transshipment point for Alaska goods such as fish, petroleum products, and other cargo, which then continue to other domestic and international markets. Likewise, many goods moved to Alaska via barge originate in Seattle. By dollar value, about three-fifths of goods reach Alaska by water and two-fifths by air or truck via the Alaska Highway. By weight, 97 percent of the goods go by water (Chase 2004).

Figure 15 illustrates the nautical distances between Seattle and Valdez, Haines, and Skagway.

Figure 15 Distances from Seattle, Washington, to Valdez, Haines, and Skagway



Source: Google Maps 2012. NOAA 2009. Distances between United States Ports.

Haines’s nautical proximity to Seattle relative to Valdez and Skagway is shown in Table 7. Based on mileage, Haines has an advantage over both Skagway and Valdez. Assuming a flat, per-mile, per-container cost to each destination, Haines has the lowest cost among its competitors for freight moving to or from Seattle.

Based on current rates for shipping goods from Seattle to Southeast Alaska, shippers save \$0.08 per pound-mile by shipping to Haines rather than Skagway, and \$0.07 per pound-mile for shipping to Haines rather than Valdez (Table 7).

Table 7. Cost Savings among Haines, Skagway, and Valdez for Barge Cargo Originating in Seattle

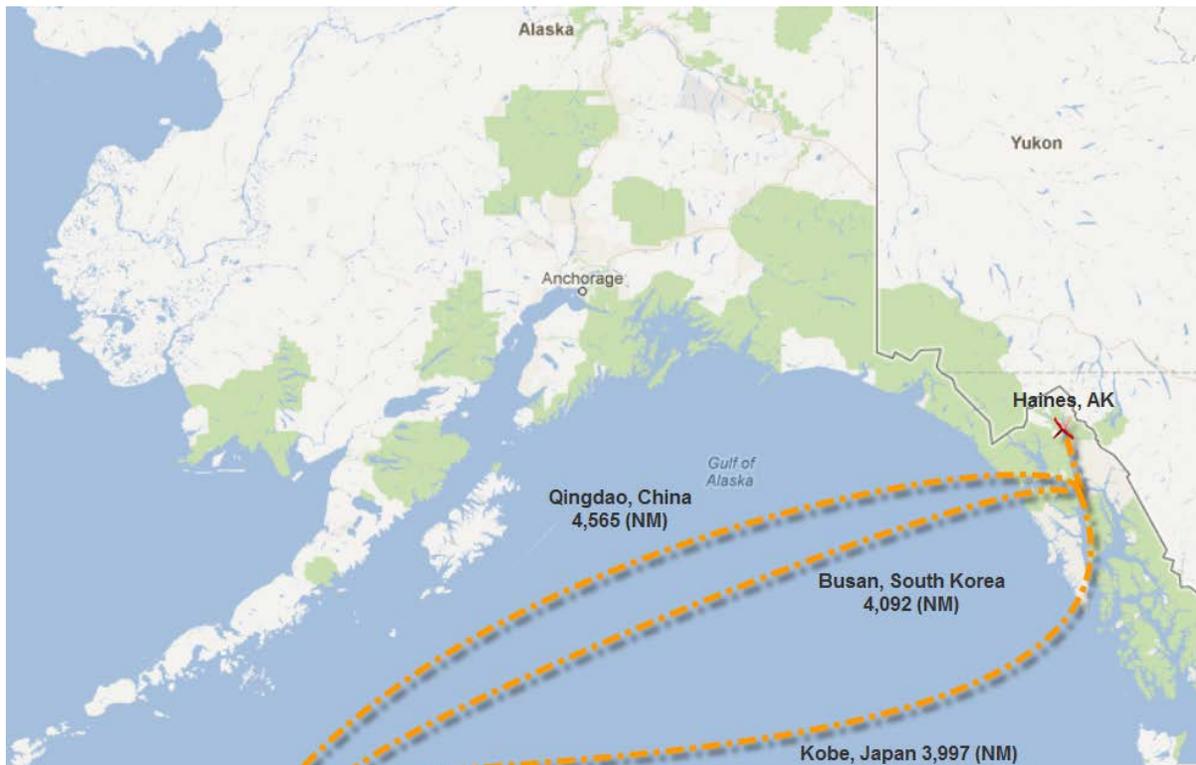
Category	Community		
	Haines	Skagway	Valdez
Distance to Seattle (nautical miles)	950	962	1,234
Shipping Cost from Seattle (\$/per lb)	0.49	0.57	0.56
Cost Saving of Shipping to Haines (\$ per lb)	-	0.08	0.07

Source: NOAA 2012; Lynden Transport 2012

3.4.1 Cost of Transporting Ore to Asian Ports of Call

Asian markets are another export destination for goods transported through Haines, Skagway, and Valdez. Goods such as fish and other seafood products, as well as petroleum products and non-ferrous metals, are transported to Asia for use in other intermediate goods and manufactured products. Figure 16 below shows the distance from Haines to selected ports in Asia.

Figure 16 Distances of Haines to Select Asian Ports



Source: Google Maps 2012. National Geospatial Intelligence Agency, World Ports 2012.

Based on mileage, the Port of Haines maintains a slight cost advantage over Skagway when moving cargo westbound to Asian markets. Assuming a flat transportation rate of \$0.12 per container-mile, a shipper could save almost \$38.40 per container shipped from Valdez, rather than Skagway, destined for the Chinese coast. Table 8 illustrates the potential cost savings between Haines, Skagway, and Valdez for selected ports in Asia. Based on this approach, Valdez is the port of preference as it is the westernmost of the three ports.

Table 8. Cost Savings between Haines, Skagway, and Valdez and Selected Asian Ports

Export Destination	Distance to Destination (Nautical Miles)		
	Haines	Skagway	Valdez
Qingdao, China	4,565	4,577	4,245
Kobe, Japan	3,997	4,009	3,677
Busan, Korea (South)	4,092	4,104	3,772
Cost Savings Relative to the Cost of using Haines (\$/container)	N/A	1.44	-38.40

Note: Assumes operating cost of \$0.12 per container-mile.
Source: National Geospatial Intelligence Agency, World Ports 2012.

Operation of Panamax (4,000 TEU⁴), Post-Panamax (6,000 TEU) and Post-Panamax Plus (10,000 TEU) is estimated to be between \$9 million and \$15 million dollars a year (Rodrigue 2012). Savings of using Haines over Skagway for a fully loaded Post-Panamax Plus would be approximately \$14,400, or less than 1 percent of total annual operating costs, assuming a vessel loaded all 10,000 TEUs in Haines. Savings of using Valdez over either Skagway or Haines are more significant.

3.5 Port Fees

In addition to cost differences generated by distance, each of the ports within the study region levies unique charges and fees. Table 9 compares the common charges at each of the facilities: dockage, wharfage, and water. While dockage and water rates in Haines are comparable to rates charged in Skagway and Valdez, wharfage rates in Haines are much higher due to rate increases resulting from a life cycle cost analysis conducted by Northern Economics in late 2010.

Table 9. Haines, Skagway and Valdez Rate Comparison

Current Rates	Skagway	Haines	Valdez
Dockage (per ft.)	\$2.80 - \$4.00	\$2.75	\$0.66 - \$3.14
Freight Wharfage (per 2,000 lbs)	\$2.00	\$3.85	\$3.50
Fuel Wharfage (per bbl)	\$0.26	\$0.84	\$0.10
Water	\$4.84 per 1,000 gal	\$50 + \$4 per 1,000 gal	\$45 + \$3 per 1,000 gal

Source: Port of Haines, Port of Valdez, White Pass & Yukon Route, & Maritime Exchange of Alaska

If a mining company was to begin transporting large volumes of equipment, fuel, or ore concentrates through Haines, the study team expects that a preferential rate agreement would be negotiated with the borough and other changes could be made to port fees because of increased use and any necessary upgrades. In anticipation of this possibility, the borough may want to undertake a preliminary assessment of the operational and administrative costs that it would incur for providing such service, and how the fees derived from these costs would compare to facilities in Skagway. It would be advantageous for the borough to know the levels of fees that would be required to recover costs at various output volumes when speaking with industry representatives.

⁴ TEU = Twenty-foot equivalent unit

4 Market Assessment

This analysis looks at three separate markets in which growth of services and cargo for the Port of Haines could be generated: the local market, the hinterlands, and the mining industry. For the purpose of this analysis, the local market consists of the borough population and local businesses; growth in this market would stem from population growth and economic activity within the borough. Similarly, the hinterland is comprised of communities inland of Haines whose populations could influence port volumes through growth in demand.

The mining industry stands apart as a third market; unlike the local and hinterland markets, demand for transportation services by mining companies will not be tied to local economic conditions or population growth. Development within the mining industry depends on factors such as world market values of mined materials, the economic feasibility of accessing individual deposits, and permitting restrictions. This analysis looks at potential increases in cargo generated by both required materials and equipment for development (incoming cargo) and volumes of ores and concentrates (export cargo volumes).

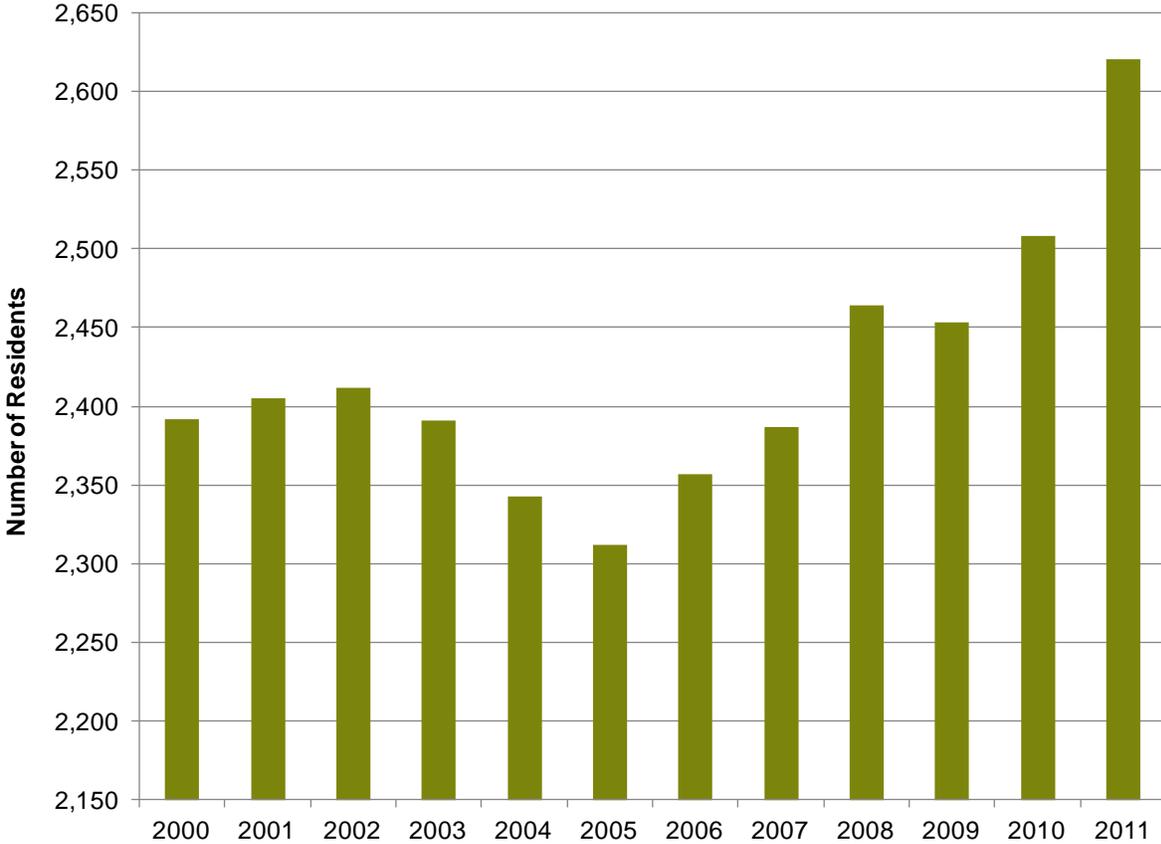
4.1 Local Market

Through interviews with port users in Haines, the study team concludes that the three major sources of port activity are demand by the local population (fuel and freight), activity generated by local businesses (bulk fuel sales, movement of construction equipment, etc.) and visitor volumes (ferry and cruise vessel passengers). In this section, we discuss each of these factors, and assess expectations for growth.

4.1.1 Population

The population of Haines increased over the last decade, rising by thirteen percent from a low of 2,300 in 2005 (Figure 17). According to the Alaska Department of Labor & Workforce Development (ADOLWD), 2011 estimates place the borough's resident population at 2,620. The population fluctuates seasonally, however, and can increase by several hundred residents during the tourism season (Haines Alaska Community Website 2012).

Figure 17. Population of Haines Borough, 2000–2011

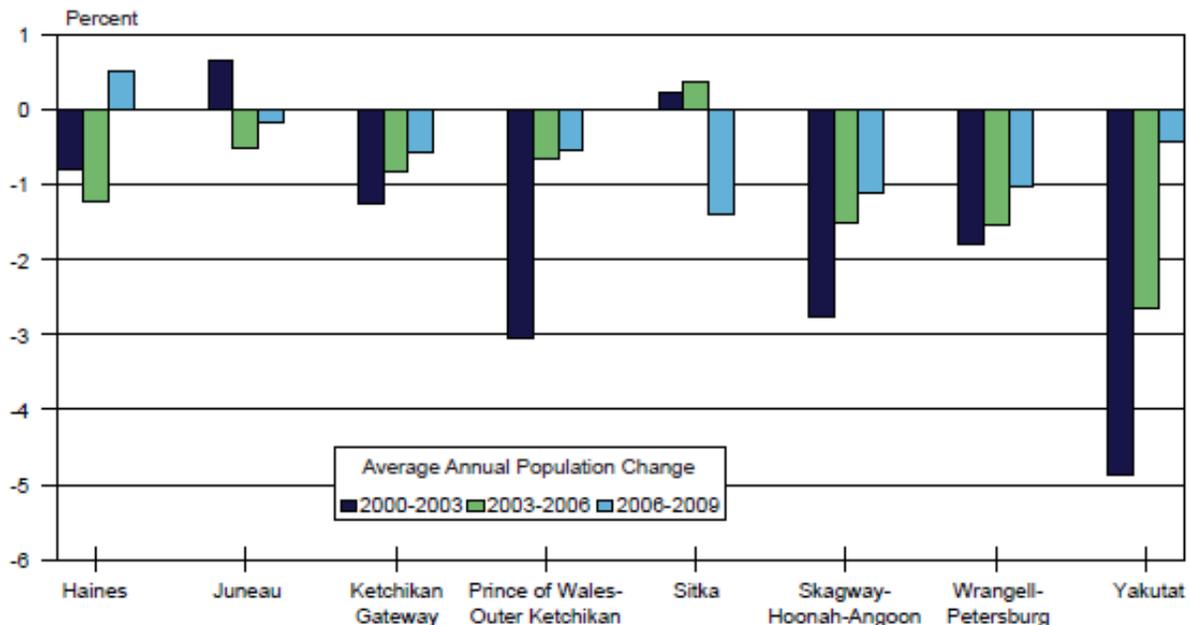


Source: ADOLWD 2012b

At first glance, it would seem that an increase in cargo volumes could have been expected given the strong trend in population growth over the last five years. The study team believes that the national recession and lack of job opportunities in the Lower 48 have resulted in more persons staying in the Southeast rather than migrating to the Lower 48. However, the growth in population in Haines contrasts with trends seen in the rest of Southeast Alaska (Figure 18) and, according to ADOLWD population forecasts, is not expected to continue.

Haines Borough accounting staff provided cargo invoices for 2011 and 2012. Due to the limited data available, the study team analyzed cargo volume changes versus population using AMHS cargo activity as a proxy for Haines. The results were inconclusive in tying population changes to cargo volume changes. Additional cargo volume data have been requested from Haines Borough accounting staff. When that information is available, the study team will conduct this analysis using Haines Borough data in an attempt to quantify the relationship between population and cargo volumes.

Figure 18. Population Change in Southeast Alaska



Source: Mercer and Abrahamson 2011

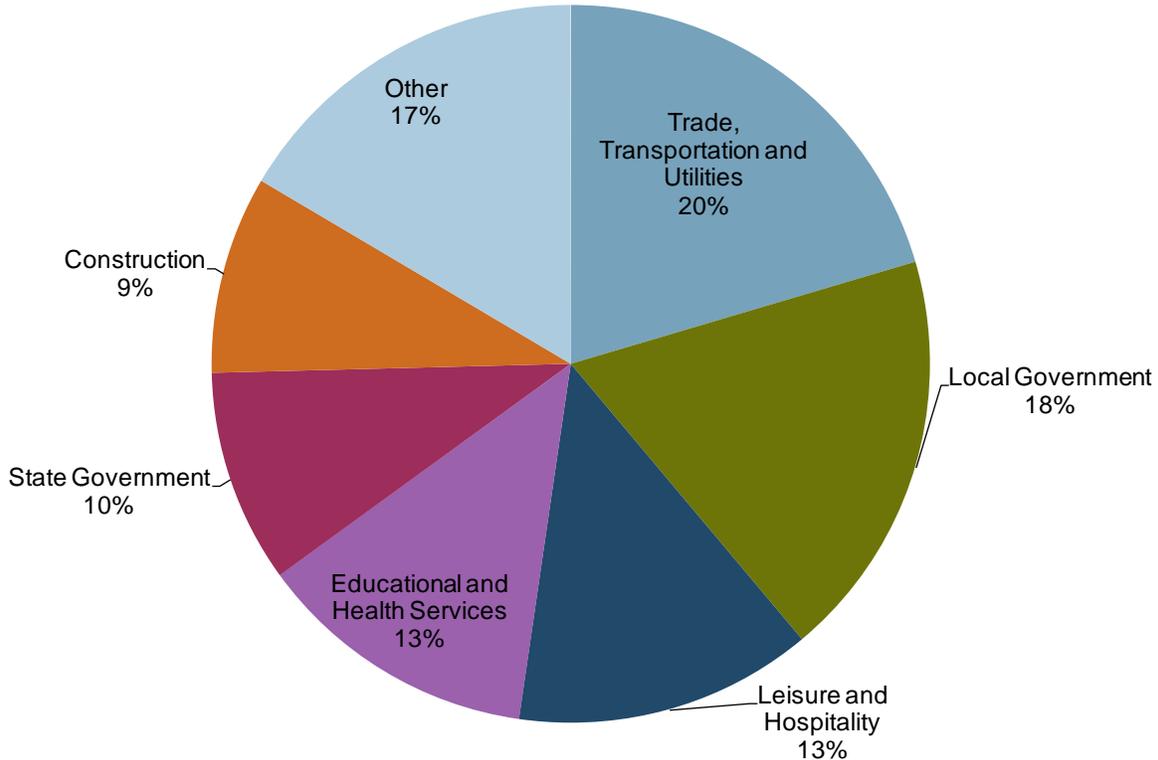
According to ADOLWD, losses from out-migration are expected for Haines, and over the state’s population projection period (which extends to 2034) the borough’s population is expected to decline by nearly 38 percent due to particularly low birth rates and the highest median age in the state. ADOLWD concludes that growth in population for the region would require a sharp rise in immigration (Mercer and Abrahamson 2011). The recently published Haines Borough 2025 Comprehensive Plan disputes the validity of the ADOLWD forecast numbers, citing inaccuracies in birth estimates and base population numbers. The borough instead foresees moderate population growth of between .85 and .47 percent per year, which suggests that Haines Borough will gain an additional 248 to 463 people by 2030.

Assuming the high case for population growth, the borough’s port infrastructure will need to meet the needs of 3,083 residents by 2030. This is an increase of 17.6 percent over the current population. Interviews with the port’s primary customers (AML and Delta Western) indicate that cargo operations are not at full capacity and, in the case of fuel volumes, are significantly below where they have been in previous years. Based on these findings, the study team anticipates moderate cargo increases as a result of population growth in and around Haines, but believes that infrastructure currently in place is adequate for meeting this increased demand.

4.1.2 Local Industry

Despite its relatively small size, Haines has a diverse economy. Most employment revolves around Trade, Transportation and Utilities; Government; Leisure and Hospitality; and Health Care; which collectively accounted for 75 percent of local wage and salary employment in 2011 (ADOLWD 2012). Figure 19 shows the relative share of the local workforce in the major industries of the area. Many of the local jobs in Haines are seasonal and the unemployment rate can vary greatly throughout the year, especially in the tourism and construction industries.

Figure 19. Resident Workers by Industry, 2011



Note: federal government, military, self-employed, and “non-resident” seafood processing workers are not included.

Source: ADOLWD, 2012b

Of the economic sectors outlined above, few are expected to lead to significant increases in cargo volumes. Education and Health Services, for example, is a growing sector in the borough, and currently represents 12.7 percent of the local workforce, nearly a 2 percent increase over the last five years (ADOLWD 2012). Haines has an older population relative to the median age in Alaska; as the population continues to age, demand for health services will likely continue to grow, increasing opportunities in the industry (Wilkenson 2010). However, this industry is service-based and, despite rapid growth, is unlikely to generate port cargo volumes.

During interviews with the port’s current customers, the study team was informed that regional fuel sales and construction volumes in Southeast Alaska in part determine the volume of cargo moved through Haines. Delta Western supplies both local users and Canadian wholesalers with a variety of petroleum products. Assuming no unforeseen shifts take place in the current market, Delta Western does not expect to see significant changes in its fuel transportation volumes through Haines (Gray 2012).

AML’s representatives’ expectations were similar to those of Delta Western—they expect cargo volumes to remain at the status quo barring any significant market shifts. Three-fourths of the cargo AML transports through Haines is incoming; local customers include grocers, lumber yards, and construction companies (Ganey 2012). AML could see an increase in cargo if any local construction projects begin, or if construction firms based in Haines take on new construction projects in Southeast Alaska. Increases in mining volumes in Yukon will have a more direct impact in Skagway; AML is

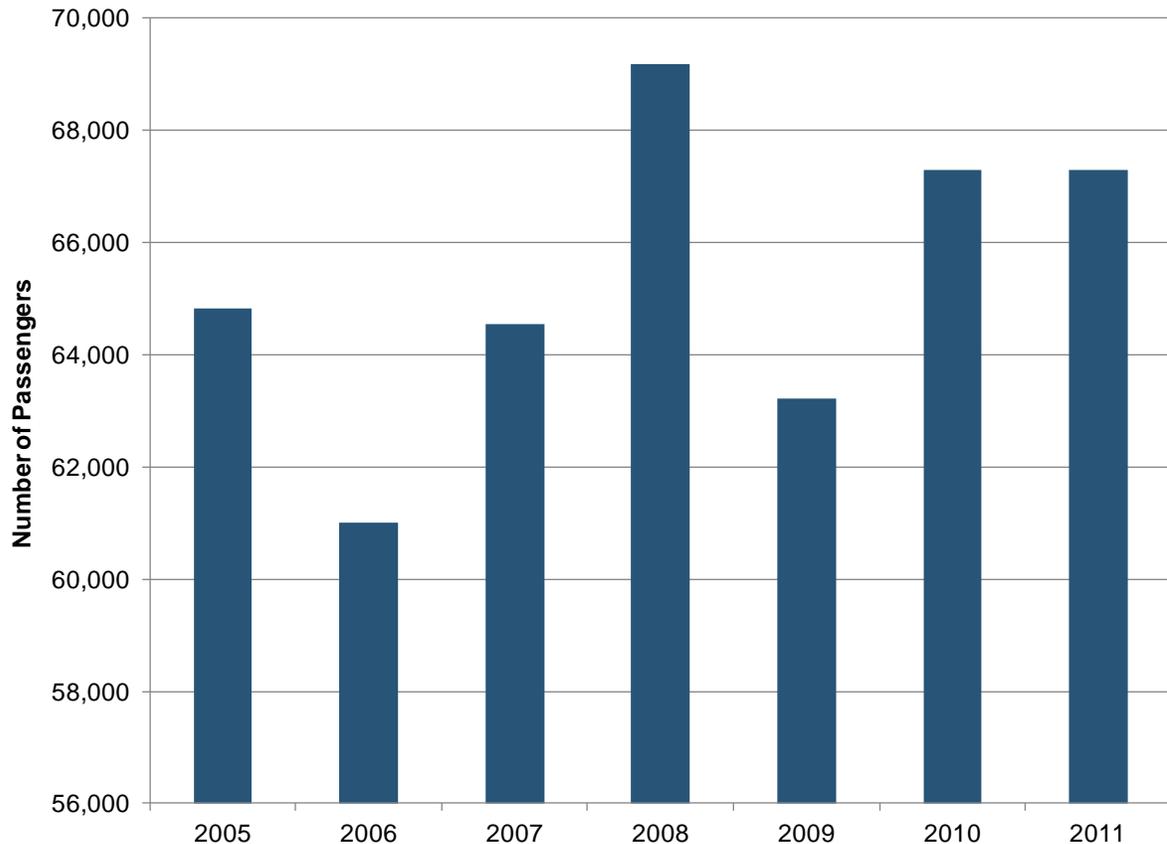
currently moving cargo for Yukon mines via their sister company, Canadian Lynden Transport, based in Skagway (Ganey 2012).

4.1.3 Cruise Vessel and Ferry Passenger Volumes

Haines is a popular Southeast Alaska tourist destination, as evidenced by the 13 percent of residents employed in Leisure and Hospitality. Each year tourists arrive by ferry, cruise vessel, and automobile, entering town through the Port Chilkoot Dock, AMHS dock or the Haines Highway. The volume of tourists is so large that the number of visitors can sometimes exceed the number of residents during the summer months (Cemany 2005). Though highly seasonal, the large influx of visitors each year brings wages and jobs that help bolster the local economy.

Figure 20 summarizes the number of ferry passengers that both embarked from and disembarked at Haines between 2005 and 2011. For all seven of the years shown, passenger volumes were between 60,000 and 70,000 people a year.

Figure 20. Alaska Marine Highway Ferry Passengers to and from Haines, 2006-2011

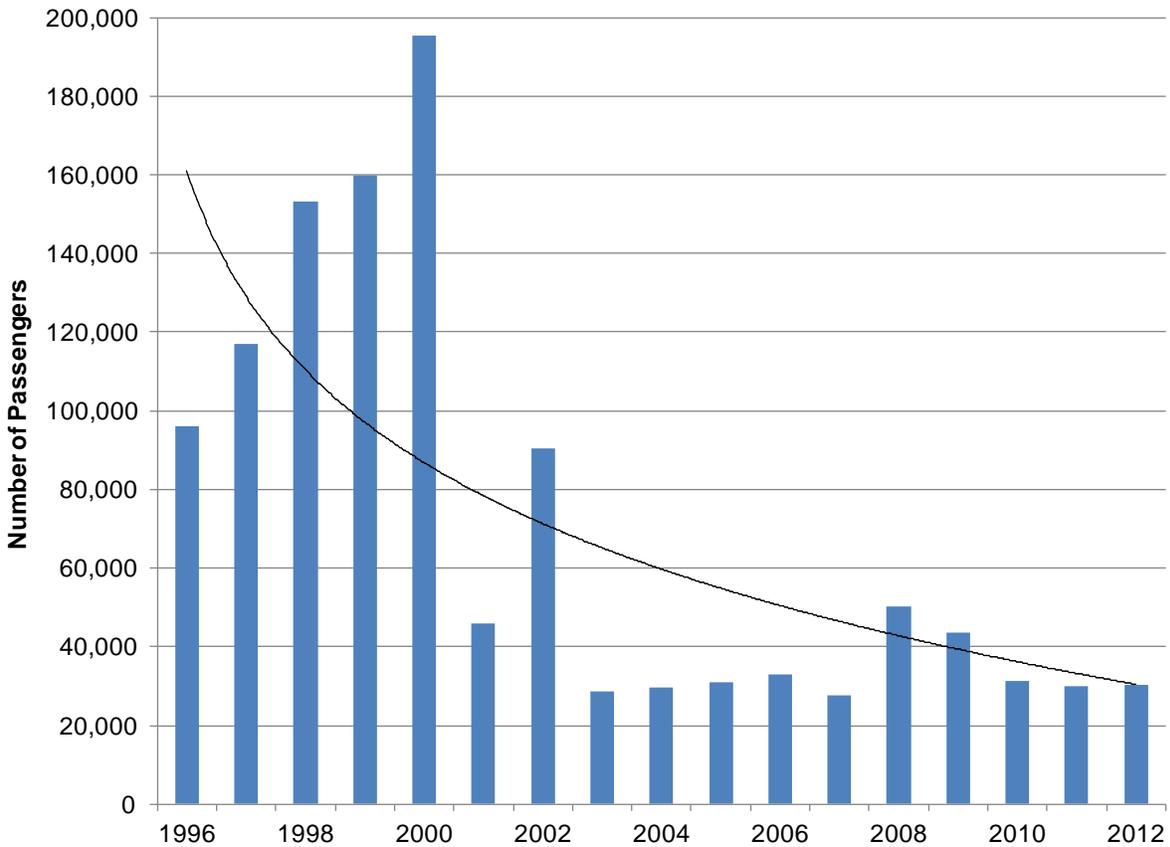


Source: Alaska Marine Highway System 2012

Figure 21 summarizes the historic volumes of cruise vessel visitors to Haines. Assuming that all cruise vessels have moored at the Port Chilkoot Dock, the level and frequency of use of the facility has declined sharply since the mid-1990s. As shown in Figure 21, the number of cruise vessel passengers visiting Haines dropped significantly in the early 2000s. Passenger visits were at a high of almost

200,000 passengers in 2000, and now average less than 50,000 annually. The drop in 2001 was a result of several factors, including the introduction of new sales and bed taxes in Haines, as well as a proposed measure to cap cruise ship arrivals (Cervený 2005).

Figure 21. Cruise Vessel Passengers to Haines, 1996-2011



Note: 2011 and 2012 are estimated using cruise vessel schedules and vessel passenger capacity.
Source: Bales 2010; State of Alaska Department of Commerce and Community Development 2010; Cruise Line Association of Alaska 2012

As noted previously, in 2012 the Alaska Legislature approved a grant of \$2.3 million to continue upgrades at the dock which will replace the deteriorating pile-supported timbers (Alaska Legislature 2012). To the study team's knowledge, the upgrades are not expected to increase the number of cruise vessel calls in Haines.

4.2 Hinterlands

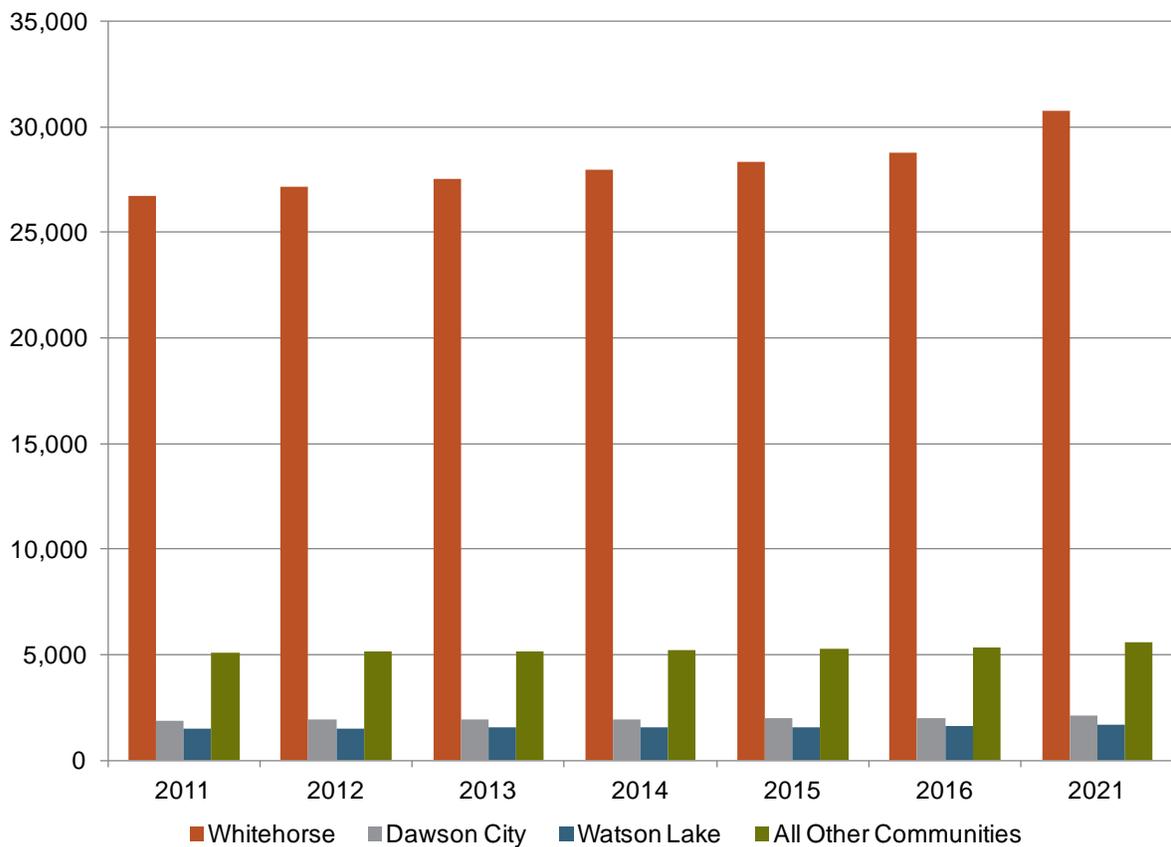
Population growth in communities inland of Haines has the potential to drive demand for transportation services through the Port of Haines. In order to gauge the growth in regional demand, the study team looked at population forecasts for Yukon and its largest cities. Relevant population forecasts are summarized in Table 10 and Figure 22.

Table 10. Population Forecasts, Yukon (2011-2016 and 2021)

Area	2011	2012	2013	2014	2015	2016	2021	Change (%) 2011-2021
Yukon	35,175	35,691	36,204	36,716	37,225	37,729	40,130	14.1
Whitehorse	26,711	27,125	27,536	27,947	28,357	28,764	30,721	15.0
Dawson City	1,880	1,908	1,936	1,963	1,990	2,016	2,133	13.5
Watson Lake	1,514	1,531	1,548	1,565	1,582	1,598	1,675	10.6
All Other Communities	5,068	5,127	5,182	5,241	5,297	5,352	5,600	10.5

Source: Yukon Bureau of Statistics 2012

Figure 22. Population Forecasts, Yukon (2011–2016 and 2021)

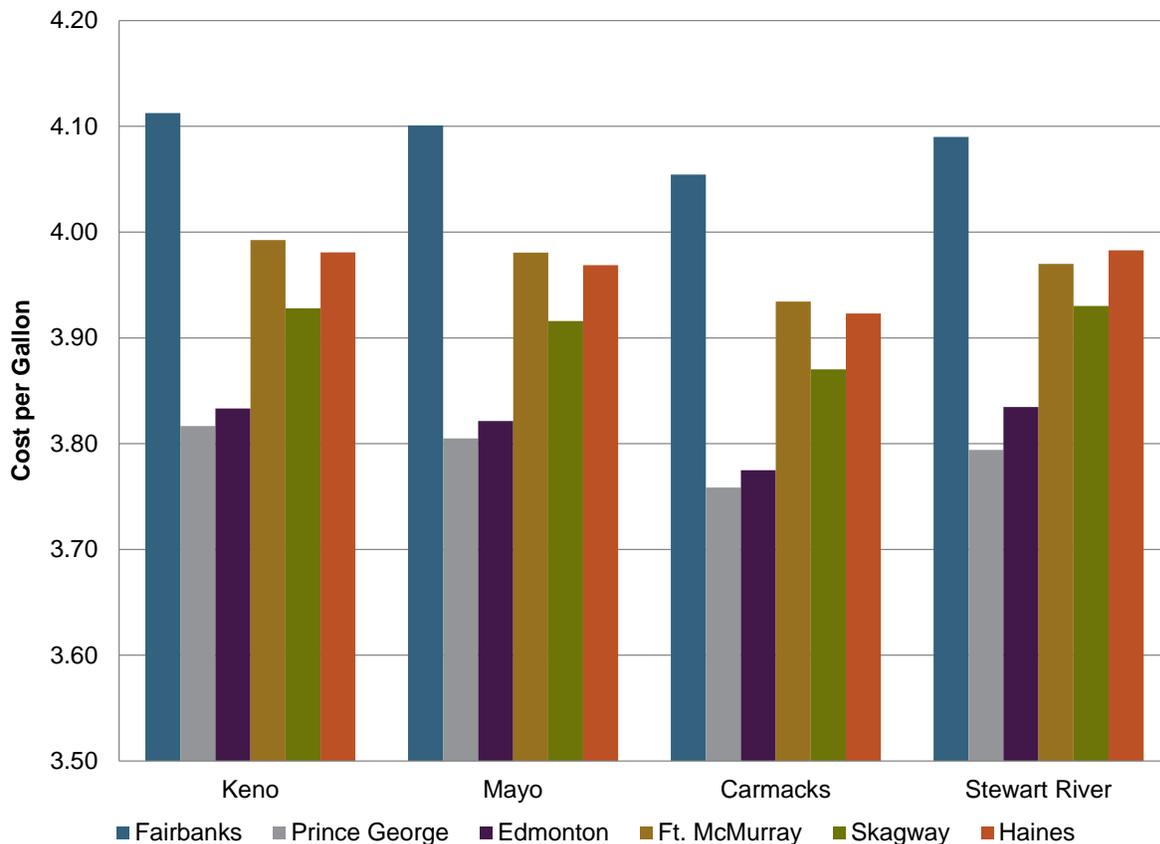


Source: Yukon Bureau of Statistics 2012

The study team believes that Haines could see increases in cargo volumes to Yukon destinations stemming from future population growth. This conclusion supports the suggestion heard during interviews that Haines concentrate on becoming a general cargo port for the region rather than focusing on mining development (Brown, et al 2012). However, in order to capture this market, the port would need to establish a role for itself as a preferred transshipment point. Goods such as fuel are currently moved to many Hinterland destinations at a lower cost via road from Edmonton or Fort Nelson (Gray 2012).

Figure 23 illustrates the study team’s estimates for delivered fuel costs at various mining locations; lower prices are yielded by trucking from inland supply points. The fuel costs shown for Haines and Skagway are estimated using fuel prices in Seattle, the additional costs of barging (including wharfage), tank farm operating costs, and trucking to final destinations. In contrast, the inland locations’ fuel costs are estimated using only local prices and the additional trucking costs associated with transportation to mines.

Figure 23. Ultra Low Sulfur Distillate Transportation Costs to Select Mining Locations via the Alaska Highway



Note: Seattle price based on ULSD #2; ULSD #1 prices used for Canadian origins as information for ULSD #2 was unavailable. Analysis assumes truck operating cost of \$4.08 per mile and barge transportation costs of \$0.20 per mile based on industry interviews.

Source: OPIS 2012; Petro-Canada 2012; Freight Calculator 2012

4.3 Mining Industry

2011 proved to be one of the most successful years for Yukon mining as a record 114,587 new claims were staked, 38 percent more than the high of 83,161 recorded in the previous year (Government of Yukon 2012). According to the 2012 Yukon Economic Outlook, there were over 100 mining companies doing exploration work in Yukon in 2011, and more than 50 of these companies are estimated to have spent in excess of \$1 million each on exploration-related work (Government of Yukon 2012).

With three producing mines and a number of other projects advancing towards development decisions, the future of Yukon’s mining sector looks promising. Currently, six projects have gone

through permitting or are in the process of obtaining the appropriate permits. Another 10 projects are doing advanced exploration or completing feasibility-related work. A few of the project proponents have noted development timelines that could see development and production within five years. The value of mineral production is estimated at \$600 million in 2012, up from \$402 million in 2011. Growth in 2012 is expected to stem primarily from a significant increase in production from the Wolverine mine, which declared commercial production in March 2012 (Government of Yukon 2012).

Table 11 summarizes information about each of the Yukon mines near Haines. The projects on this list came from a mining policy analyst in the Government of Yukon (Stephens 2012). Several of the potential projects listed are still in the pre-feasibility or exploration stage, so the projected timelines, reserves, and ore/concentrate volumes are considered estimates and will likely change as development progresses.

Table 11. Yukon Prospective Mining Development Summary

Characteristic Type	Atac Resources	Copper North	Kaminak Resources	Prophecy Platinum	Selwyn Resources	Victoria Gold	Western Copper & Gold	Constantine Metal Resources
Property	Rackla-Osiris	Carmacks Property	Coffee Gold Project	Wellgreen Property	Selwyn District	Dublin Gulch	Casino Property	Palmer VMS Project
Approximate Location	Keno City, Yukon	Carmacks, Yukon	Stewart Lake	Burwash Landing	North of Watson Lake	Mayo, Yukon	Carmacks, Yukon	Haines, AK
Type of Resource	Gold	Copper	Gold	Platinum Group Metals	Lead, Zinc	Gold	Gold, Copper, Silver, Molybdenum	Silver, Copper, Zinc, Lead
Indicated Mineral Reserve (000' of tonnes/yr)	N/A	*3,200	None	14,000	180,690	91,600	*90,970	N/A
Anticipated Ore Throughput Volume (tonnes/day)	N/A	5,000	TBD	32,000	20,000	29,500	25,000	TBD
Expected Mine Life (Years)	N/A	6	TBD	37	TBD	10	23	TBD
Current Status	Pending Sale	Permitted for Construction	Exploration	Exploration for Expansion	Permitting	2nd Screening	Pre-feasibility	Exploration
Road Infrastructure	Unknown	Unpaved Exploration Road	Unpaved Exploration Road	Seasonal Gravel Road	TBD	Paved All-Weather Roads	Paved All-Weather Roads	Paved All-Weather Roads
Timeline (Full Production est.)	N/A	TBD	TBD	2019	2015	2015	2020	TBD
Available Feasibility Study?	No	Yes	No	No	No	Yes	Yes	No
Est. Distance to Haines (mi)	479	338	No Direct Route	250	No Direct Route	380	338	33

Source: Publicly available materials from individual company websites and publications. Please refer to references for a comprehensive list.

Note: *Proven

In an effort to ground truth the material shown in Table 11, and gather insight as to how these mining developments will decide on a preferred port for ore exports, the study team interviewed representatives from Prophecy Platinum, Selwyn Resources, Copper North Mining, Atac Resources, and Western Copper and Gold. In these interviews, the team learned the following:

- Many mining companies who will likely use Skagway as an export port first considered Haines. Most of these companies ended up building access roads that connect to the Klondike Highway, making Skagway the closest—and thus preferred—port of export. Hauling is the key economic variable for most decision-making between Haines and Skagway.
- The cost of moving ore plays a large part in deciding which port of call is the best fit.
- Moving additional cargo through a port that already sees industrial use by mining companies is viewed as less likely to receive public scrutiny.
- Mining companies are risk averse. The more information that is available regarding potential permitting issues, the better.
- Haines does not have a handling facility designed specifically for ore; this could be a liability for a company that decides to move non-containerized concentrates through Haines.
- Haines’s port is outside of the community’s view, which may limit frustration with high industrial usage. However, access to the port requires industrial traffic to travel through downtown, which may be disliked by residents.
- Atac Resources intends to sell the Rackla-Osiris property to a new developer in the near future. Reasons for the sale were not given.
- Prophecy Platinum is interested in using the Port of Haines as its export facility. They are still in the exploration phase and plan to release a feasibility study in the first quarter of 2013, which will indicate their likely preference for the port facilities they intend to use for exporting ore concentrate.
- Selwyn Resources, while not intending to use Haines as an export facility, did express the possibility of using Haines as an import facility for moving materials required for construction or extraction in the Selwyn District.

In addition to outbound freight, the study team considered potential volumes of incoming materials destined for Yukon mine sites. Mining developments require incredible amounts of energy: “Energy costs are estimated to represent more than 15 percent of the total cost of production in the mining industry in the US” (McIvor 2010). Table 12 summarizes the energy sources expected to be used at each of the mine sites reviewed in this analysis.

Table 12. Anticipated Energy Sources for Yukon Mining Projects

Local Electric Utility	Not Yet Determined	Diesel trucked from Edmonton	LNG trucked from British Columbia
Copper North	Kaminak Resources Victoria Gold Constantine Metal Resources Atac Resources	Selwyn Resources	Western Copper & Gold Prophecy Platinum*

*May truck diesel

Source: Individual Mining Company Documents and Interviews, 2012

As noted in Table 12, Copper North and Prophecy Platinum plan to obtain their electrical energy from local utilities. Currently Yukon Energy Corporation and Yukon Electrical Company provide power to the southwest region of Yukon. Yukon Electrical operates 25 kV lines and, given that certain requirements are met, offers financial assistance for transmission line construction to potential customers (Sharma 2012). Yukon Energy does not offer any kind of capital recovery programs to potential users, but does seek opportunities where shared costs and/or grant funding may be available (Campbell 2012).

Several ongoing projects are intended to increase the availability of power to existing and potential mines in Yukon. The West Creek Hydro project could potentially provide an intertie between West Creek, AK and Whitehorse, YT. The project would provide onshore power to seasonal cruise vessels in the summer months and any excess energy in the winter months could be available to the Upper Lynn Canal and/or Yukon. Another project that is currently being evaluated is the development of Eagle Plains oil and gas resources located near the Dempster Highway, between Dawson City and Inuvik. The Eagle Plains region is expected to contain six trillion cubic feet of natural gas and more than 400 million barrels of oil (CBC 2011). Energy sector professionals believe that a natural gas pipeline could be constructed from Eagle Plains to a central Yukon location for conversion to LNG. Haines would then be the likely location to ship the LNG to export markets due to available space in the vicinity of the Lutak Dock. In addition, the Lutak Dock does not have the issues as does Skagway with potential LNG terminals in proximity to cruise ships and residences. Along the pipeline would be spurs to area mines, providing access to natural gas, an affordable and more sustainable form of energy than other liquid fuels such as diesel.

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