

ALASKA – CANADA RAIL LINK STUDY

MULTIMODAL PORT ACCESS WORK PACKAGE B2 (d) OPERATIONS EVALUATION

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1.0 Introduction

This report is part of The Alaska Canada Rail Link Feasibility Project. Increased economic activity in Alaska and the Yukon will be an outcome of the proposed Rail Link.

Development of natural resources will be an important component of this increased activity. This will create a need for access from Alaska and the Yukon to world markets for these bulk commodity resources and access from world supply points for the products needed to create and support these resource projects.

In many cases the most efficient transportation to and from these distant markets and supply points will involve ocean transport and a key element in the economic feasibility of most projects will be the availability of economic inland transportation linked to terminal access to ocean transportation.

This report examines the ports and terminals identified in the Port Access Data Development report (Work Package B2 (a)) and assesses their current and potential ability plus the issues needed to be addressed for them to provide the link between land and ocean transportation modes for existing and potential resource development and inbound supply projects in Southeast Alaska and the Yukon. The final section summarizes conclusions that can be reached with respect to the best and most realistic port and terminal alternatives that are, or could be, available to handle inbound and outbound shipments in support of resource development in Alaska and the Yukon.

A wide variety of ports and terminals were covered in the Port Access Data Development report. These are assessed and organized here in terms of the Alaska and Yukon economic catchment area that they support or could logically support from an outbound resource cargo and inbound supply perspective. This relates directly to their physical location and the existing, planned or potential rail and / or road links that they are, or could be, connected to.

The map located in the Appendix identifies three more or less distinct areas logically served by current or potential ports and terminals. These are designated as:

Port Group Area I	servicing South Central Alaska (Anchorage, Port Mackenzie, Seward, Whittier, Valdez)
Port Group Area II	servicing Southeast Alaska and the Yukon (Skagway, Haines)
Port Group Area III	servicing Southern Yukon and Northern BC (Hyder / Stewart, Prince Rupert, and Kitimat)

These defined areas are limited to the focus of this study, Alaska and the Yukon (and Northern British Columbia) and there are clearly overlaps in the catchment areas. It is also recognized that the nature, volume and value of commodities and services will dictate the transportation distance realities for various products which, in special cases, may extend beyond these defined areas.

The following sections include an operations evaluation of the terminal facilities in each of the three Port Group Areas in terms of their capacity to facilitate catchment area economic growth.

2.0 Port Group Area I - Anchorage, Port Mackenzie, Seward, Whittier and Valdez

2.1 General Description

The ports and terminals in Port Group Area I are located in Southern Alaska, North of the Alaska panhandle which borders Northern British Columbia. These ports have various degrees of deep sea vessel access, are connected to the Alaska highway network, and in some cases to the Alaska Railroad, and have existing terminal facilities with some potential to develop additional capacity.

Key to these terminals is the road and rail links in the region and the principal junction points which provide direct or indirect transportation routes to the ports.

With reference to the map in the Appendix, the South Central Alaska ports in Port Group Area I serve the catchment area encompassing the Alaska urban centres of Anchorage and Fairbanks. Two of the ports in this group are served by the Alaska Railroad: Seward in the Southern terminus of the Alaska Railroad. Anchorage is the main deep sea entry point of the State of Alaska.

As shown on the map in the Appendix, Port Group Area I is served by a network of North to South and East to West highways.

2.2 Port of Anchorage

The photograph below provides an overview of the Port of Anchorage along with potential marine terminal re-development footprint.



2.2.1 Current Activity

The Port of Anchorage serves 80% of Alaska's populated area including major military installations. The Port is well connected to road and on-dock rail (Alaska Railroad) and can receive up to mid-size ocean going ships depending on draft configuration. Port facilities include intermodal, general cargo, Ro / Ro and liquid petroleum docks.

Port cargo activity reached an estimated 5 million Tonnes in 2005 consisting of containerized freight, general iron and steel products, project cargo, bulk petroleum and cement. The Alaska Railroad's main intermodal yard is approximately one mile from the intermodal docks and tracks are maintained to the docks. In addition, the intermodal docks are used to service cruise ships during the 5 ½ month cruise season.

A pipeline system services a bulk petroleum facility capable of handling more than 22 million barrels of product annually. Anchorage is an important terminus for bulk refined petroleum shipments to the Fairbanks refinery, the refineries on the Kenai Peninsula and Valdez, jet fuel imports for the military as well as a redistribution point for barge shipments of petroleum products to other Western Alaska communities.

2.2.2 Capacity / Potential

With its rail and road connections to a significant portion of Alaska's populated area, the Port of Anchorage has capacity to handle additional volumes of both petroleum products and the current mix of containers, project cargo such as steel pipe and specialized smaller volume higher value compatible bulk products such as cement.

However, other than petroleum liquids, there is little obvious capacity that can be developed to handle higher volume, lower value bulk commodities. Issues here include the lack of significant available terminal contiguous land, the close proximity of the port to the City of Anchorage and the pressures and challenges that urbanization brings to bulk type industrial activity (e.g. Government Hill residents ongoing concerns about safety and pollution). Visionary plans for a major foreshore reclamation would allow for Port expansion. However, development of this magnitude is considered to be some time off.

Another important issue affecting potential for the Port of Anchorage is the vessel draft limitation caused by the Knik Shoal. This navigation feature in the channel leading from Cook Inlet to Anchorage (and Port Mackenzie) limits outbound fully loaded bulk type ships to Handymax size, and would preclude loading to the Panamax or Capesize vessels needed to achieve the necessary ocean freight economics on higher volume lower value bulk commodities such as coal.

2.3 Port Mackenzie

The drawing below provides an engineering concept of the Port Mackenzie development.



2.3.1 Current Activity

Port Mackenzie is located on deep water across Knik arm from Anchorage and is situated in a position to service cargoes to and from South Central Alaska. Port Mackenzie enjoys road access to the Alaska highway system however does not have connection to rail, and like Anchorage, is limited to handling small to mid-size ocean going vessels.

In recent years the Borough of Matanuska – Susitna has expanded a barge / project cargo facility into a deep sea bulk handling berth which handled its first bulk commodity vessel shipments in 2005. Unique to this terminal is the fact that the contiguous serviceable land for storage, etc. is at the top of an escarpment which is at higher altitude

than the sea level berth facilities. The storage area is connected to the berth and shiploader by an inclined bulk commodity belt conveyor.

Business activity consists of project cargo, in particular modular housing, and bulk wood chip storage and loading to bulk vessels. Planning is underway to handle aggregates through the bulk handling facility.



Port Mackenzie

2.3.2 Capacity / Potential

The existing barge and bulk handling assets are lightly used and significant capacity exists for compatible products or commodities based on inland truck transportation. The Borough has the vision to become a major bulk handling port to service exports from the South-Central Alaska catchment area.

With no urban encroachment issues and plenty of nearby land earmarked for industrial use, Port Mackenzie could increase its capabilities in a major way to facilitate natural resource growth in the region. The disadvantage of no rail connection and a considerably longer road distance than Anchorage could be offset by plans for both a bridge connection over Knik Arm to Anchorage and construction of an approximately 45 mile, (72 km) rail link to Houston on the Alaska Railroad. Both of these projects will involve major capital investment which would require equally major resource volumes if purely business case economic justification is necessary.

In the event of major expansion at Port Mackenzie, another issue will be Knik Shoal and the draft limitations it places on bulk vessel loading (limited to Handymax size vessels). As is the case for the Port of Anchorage, large volume natural resource exports such as coal will require bigger, deeper draft Panamax vessels, and probably Capesize ships to competitively reach offshore markets.

Removal of the Knik Shoal to eliminate this serious restriction would be an enormously costly undertaking.

2.4 Port of Seward

The photograph below provides an overview of the facilities at the Port of Seward.



2.4.1 Current Activity

The Port of Seward in Resurrection Bay is well connected to the Southern Alaska hinterland by road and rail (Alaska Railroad Corporation - ARRC) and is capable of handling large ocean going vessels. There are three separate terminals in the port, all owned by ARRC and situated on land which is also owned by ARRC. These consist of a single finger dock bulk coal loading terminal (Seward Coal Loading Facility), a two berth passenger dock (Seward Passenger Dock) and a single berth intermodal freight dock (Seward Freight Dock).

The Seward Freight Dock was constructed to handle existing movements of intermodal cargo and allowed for conversion of the former freight dock into a passenger only facility. This was necessary to remove the physical danger to passengers of freight operations in close proximity to cruise and ferry traffic. This separation also facilitates the increasing security arrangements now necessary in all ports and terminals. Currently the intermodal freight dock handles cargoes such as log loading and steel pipe unloading to truck or railcar with rail service on the dock.

The dedicated passenger dock has permanent on-dock passenger and baggage service buildings and both vehicle and on-dock rail access for cruise and ferry traffic. During the 5 ½ month cruise season this terminal has capacity for two cruise ships simultaneously, one on either side of the dock. The Seward Coal Loading Facility is operated by Hyundai Merchant Marine under a lease from ARRC to service the shipments of steam coal from the Usibelli Coal Mine at Healy, Alaska to South Korea.

2.4.2 Capacity / Potential

There is existing capacity at the Seward Freight Dock for increased handling of inbound and outbound intermodal and specific 'bulk' or break-bulk dry cargo such as logs. Use of the Seward Coal Loading Facility is currently dedicated to Hyundai Merchant Marine and Usibelli steam coal with further incremental capacity upgrades possible by matching terminal storage and handling capacities to vessel loading and carrying capacities. Major expansion to accommodate new bulk commodity exports would be limited to carbon compatible products and volumes would be limited by the existing stockpile capacities.

Rail distances to Seward are greater than to Anchorage or Whittier, a severe grade limitation at Moose Pass requires extra rail handling and severe winter snow conditions affect both rail and road access. Other issues impacting on significant expansion here will include the lack of any substantial available contiguous land for storage, a fairly rigorous environmental approval process and the necessity to operate in a manner not detrimental to existing and growing cruise and ferry passenger traffic.

2.5 Port of Whittier



2.5.1 Current Activity

The Port of Whittier has road and rail connections to its catchment area and can be accessed by deep sea vessels. The Port is a focal point for marine activity and freight transfer from sea-train barges servicing South-Central Alaska. It is used by the Alaska Railroad as a main port of access to the lower 48 states and the Canadian national railway systems via a branch line to Portage, Alaska where it connects to the AARC mainline from Seward. Freight terminals in the Port are owned by the Alaska Railroad Corporation while cruise ships are handled at the Lynden – Princess Cruise ship Dock. Current shipments consist of general and project cargo and containers mainly via the existing barge transfer facilities which accounts for approximately 25% of ARRC's state-wide freight revenue.

2.5.2 Capacity / Potential

The current facilities are undergoing improvements to incrementally increase capacity for passenger and tourism activities, as well as for intermodal freight handling. However any significant expansions are limited by the proximity of the City and lack of available land for expansion. A major issue limiting freight expansion or development of bulk commodity handling is the focus on tourism due to Whittier's closest recreational access

to Prince William Sound and the rail capacity conflict with passengers during the cruise season.

Another major issue preventing expansion to service volume movements at Whittier is the bottleneck to rail and road capacity caused by the alternating traffic patterns through the single lane shared rail/road Anton Anderson 2.5 mile tunnel to access Whittier. Other limiting issues are the strong winds, frequent fog and heavy precipitation which impacts vessel movements and the fact Whittier is in an area considered high seismic risk and road and rail access is subject to frequent avalanches.

2.6 Port of Valdez

The photograph below provides an overview of the Port of Valdez featuring the floating berth.



2.6.1 Current Activity

The Port of Valdez has road access to Alaska's interior and can receive the largest ocean going vessels. Valdez is the Southern terminus of the Alyeska Oil Pipeline from the North Slope however there is no rail access. The Port has major oil loading terminal facilities capable of loading petroleum Super tankers.

In addition the Port has a combined grain elevator and container terminal located on 21 acres and served by a floating dock capable of accommodating Capesize bulk vessels and Post Panamax container ships. The dock is a multi-purpose berth capable of handling containers, Ro / Ro cargo and lift on / lift off operations. Current activity consists of inbound re-supply container cargo, general cargo and project cargo routed by truck to inland Alaska points.

2.6.2 Capacity / Potential

The container facility has capacity to handle increased containerized or certain project cargoes including steel pipe capable of being moved inland by truck, and the grain elevators are underutilized with excess capacity available. However, Valdez is in the centre of a highly seismic activity area of Alaska and suffered severe damage to facilities during the 1964 earthquake. This seismic risk, the lack of rail access and any existing facility capable of handling bulk commodities, severely limits Valdez' potential for natural resource exports or other volume dry bulk cargoes.

3.0 Port Group Area II Skagway, Alaska and Haines, Alaska

3.1 General Description

Port Group Area II ports, Skagway and Haines, are situated at the head of the extensive Lynn Canal, at the 'top' of the Alaska panhandle, adjacent to the Southwest corner of the Yukon and the Northwest corner of British Columbia. Both ports represent the shortest access to tidewater for Southern Alaska and much of the Yukon and can receive large deep sea vessels. Skagway is connected by road and to a limited extent by rail to its economic catchment area while Haines has road access only.

As illustrated on the map in the Appendix, the catchment area of Port Group Area II at the centre of the study area is large. This geographic area encompasses a trapezoid from Delta Junction, Alaska on the West to the vicinity of Watson Lake on the Yukon and British Columbia border. Haines is served by a road connecting its port to Haines Junction and points East and West. Skagway is served by the road to Whitehorse and from that key location West to Haines Junction, North to Carmacks and Ross River and East to Teslin and Watson Lake.

3.2 Port of Skagway

The photograph below provides an overview of the Port of Skagway during the cruise ship season.



3.2.1 Current Activity

The Port of Skagway has seen a dramatic shift, from an industrial freight-oriented port based on handling natural resource exports, to a picturesque 'Disney-like' tourism-oriented port and city focused on servicing the growing Alaska cruise ship industry and related tourism activities. This has involved the conversion of existing industrial freight port terminals to cruise ship berths with passenger and baggage handling facilities linked to tourism activities which are based in, or originating from, Skagway. With approximately 600,000 cruise passenger visitors each season, tourism, from cruise ship calls and related activities and services, is now *the* economic driver for Skagway.

The Port of Skagway is connected directly to Southeastern Alaska and the Yukon by highway and to Carcross, Alaska by the privately owned White Pass & Yukon (WPY) narrow gauge railway. Unused WPY narrow gauge tracks and rail bed continue on from Carcross to Whitehorse and to the dormant Utah transload yard on the outskirts of Whitehorse.

There are four main dock facilities in Skagway currently servicing cruise ships, ferries and barges:

White Pass Railroad Dock

This two berth dock has dual gauge rail along approximately half its length and was originally used for container and general cargo ships. It is now used exclusively as a passenger facility for up to two large cruise ships simultaneously during the five month cruise season.



Broadway Dock

This single berth dock was originally used to ship timber however is now dedicated exclusively to handle cruise ships with attendant passenger and baggage handling facilities.

Ferry / City Dock

This facility services the scheduled Alaska State Ferries and small cruise ships plus limited service for Ro / Ro barges carrying containers, general or project cargo.

Ore Dock

Originally built to handle mineral concentrate exports, an existing bulk storage warehouse was dismantled, the bulk conveying systems removed or abandoned and the bulk shiploader decommissioned. The dock now provides a single cruise ship berth, petroleum storage tanks, a truck transfer station and access to a Pass-pass barge facility for containers, general and project cargo.



AML shipping statistics are propriety. However, an estimate of this traffic to Skagway is up to 5,000 TEU annually which is equivalent to approximately 40,000 tonnes. Current fuel volume through Skagway is 55,000 tonnes per year as reported by Petro-Marine.

3.2.2 Capacity / Potential

There is currently no capacity to handle bulk commodities through the Port of Skagway, however potential exists to develop such capacity. There is existing capacity to handle foreseeable increases in barged containers, petroleum products, general and project cargo and additional capacity could be constructed for any major increase in volumes (such as would be needed to handle inbound heavy gauge large diameter steel pipe). For this to happen, many issues unique to Skagway will need to be addressed. Existing capabilities and potential for growth for the Skagway terminals are described below and a discussion of some important general issues that will impact growth or potential expansion in the Port of Skagway follow.

White Pass Railroad Dock

This facility is unsuitable for bulk resource shipments. It is problematic whether it could now or in the future handle inbound cargo such as steel pipe delivered to rail (even when not being used for cruise ships) due to a City seawall / seawalk project which will limit rail access to and from the dock.



Provision of truck access to the dock should be possible which would allow for transshipment from vessel to truck of the up to 1million tonnes of pipe that might be required over an 18 to 24 month period for projected new pipeline development(s). Although there is no staging area for the pipe on or near the dock, with some site preparation the available 80 acre (32 ha) Russell upland property about 3 miles (5 km) by road from the Port could readily accommodate a necessary lay down area for storage and staging.



Broadway Dock

With its on-dock passenger and baggage handling facilities this terminal is unsuitable for either bulk, containerized or project cargoes with no potential to develop same.

Ferry / City Dock

This dock cannot handle bulk cargoes but does have some capacity for normal growth in barge and Pass – pass project cargo, containers etc. There is little capacity to develop significant new capacity.

Ore Dock

There is capacity to handle increased Pass-pass barge cargoes at the Lynden AML sublease at the North end of the Ore Dock water lot. With the abandonment and/or removal of the previous bulk handling equipment, the Ore Dock at present is limited to servicing cruise ships and can no longer handle bulk materials. Its offshore dock configuration and the installation of passenger handling facilities also limits any capability for handling general or project cargo.

There is a significant opportunity to develop both bulk and break bulk project cargo handling capacity on this site. Two projects have been identified and preliminary engineering studies undertaken based on servicing the offshore exports of potential new resource development(s).

Alaska Industrial Development and Export Authority

This project is designed to utilize as much as possible of the existing Ore Dock by refurbishing it to handle approximately 1.2 million tonnes of thermal coal annually from Cash Minerals proposed mine at Division Mountain approximately 180 miles (290 km) by road to Skagway. The concept involves trucking in of the coal to walled open storage with 'manual' mobile equipment and conveying to the existing (rebuilt) fixed point shiploader loading relatively slowly to Panamax vessels up to 60,000 DWT which would share the existing berth with cruise ships. Also included for the project is the possibility to export smaller volumes of copper/gold concentrate from Grupo Mexico's Minto Mind Exploration Ltd which is 75 km Northwest of Carmacks. This project could have sufficient capacity for these two mines however there would be insufficient capacity for other volume shippers.

Issues particular to this project include capital recovery of the estimated US\$8 million investment over 1.2 million tonnes of coal and a relatively small volume of copper and copper/gold concentrates annually, higher terminalling operating costs implicit in the less automated but lower capital cost operating model, containment of wind borne dust given the proximity of the terminal to Skagway, and for five months, sharing the berth with cruise ships (with the implicit proximity to pristine cruise vessels and passengers), and the acceptability to residents and the city of up to one inbound and one outbound coal truck traveling through Skagway every 10 minutes.

Pacific Contract Company LLC Project Concept

This project involves rebuilding the Ore Dock to retain an improved single berth cruise ship capability and add a new berth to significantly increase capacity for

bulk shipments plus containers, general and project cargoes. Designed annual capacity is for 1.5 million tonnes of coal, an estimated 500,000 to 1.3 million tonnes of mineral ore concentrates (depending on number of grades) plus 450,000 tonnes of inbound steel pipe or equivalent. The new facility would be capable of efficiently handling trucks and railcars into covered storage and would include automated handling systems capable of quickly loading up to 140,000 DWT Capesize vessels commonly employed in the coal trade.

Conceptual drawings subject to approval for release.

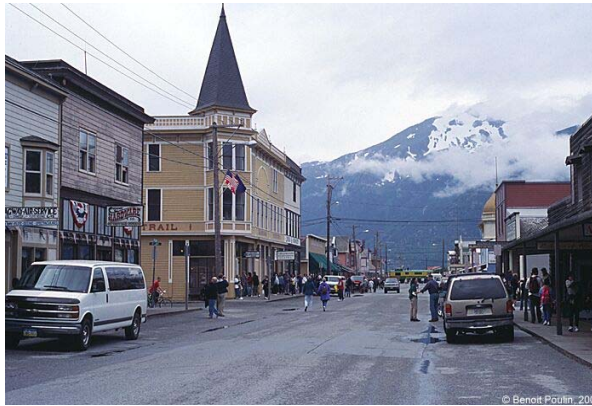
Many of the issues listed below which are unique to handling significant commercial freight in and through Skagway are addressed by this concept. However its estimated cost of US\$100 million will undoubtedly require considerable resource tonnage commitments to support the investment. In addition, the unit train railcar handling aspects of this project are based on converting the existing White Pass & Yukon Railway to standard gauge rail for direct connection to the existing and planned links of the Alaska Railroad system at an estimated cost of at least US\$200 million.

3.2.3 General Port of Skagway Expansion Issues

Tourism in Skagway has for many years replaced the former boom and bust industrial commodity activity. It now steadily drives the Skagway economy and is a major financial generator throughout the region.

Skagway tourism is based on the cruise ship industry which does not commit to long term contractual arrangements with ports and which has a track record of switching ports if its berthing and passenger servicing needs are compromised in any way. An example of the economic impact of this business is the unofficially reported US\$4+ million profit generated just by the White Pass and Yukon Railway from its cruise services and the estimated 300,000 passengers it carries each season on its designated International Historic Civil Engineering Landmark narrow gauge scenic railway. (The Eiffel Tower, Statue of Liberty and Panama Canal are similarly designated.) Any expansion involving existing rail service will have to work around tourism passenger train impacts and any change in rail such as upgrading to standard gauge will need to overcome heritage concerns.

Terminal expansion will particularly need to address concerns that increased freight activity could put at risk, or detract from the ability of Skagway to maintain and grow its cruise based tourism business, a significant challenge. This will include traffic issues, noise and visual pollution concerns as well as safety and security issues implicit with industrial and tourism traffic in close proximity.



Resource based commodities require regular year round shipping to meet market demand and accommodations will be needed to share road and rail infrastructure with cruise passenger traffic in the confined Skagway area (at least during the day, Mondays to Thursdays) for five months each year.

In the case of resource exports and terminal expansion dependent on improved rail access, in addition to investments to overcome the tourism issues outlined above, significant capital will be required to upgrade track and rail capacity (e.g. the estimated US\$ 200+ million cost of converting to standard gauge plus locomotive power additions and upgrades at an estimated US\$ 1.8 million per unit). Major investments will be also be needed to acquire new rail snow removal equipment and construct new snow sheds required for winter rail use. In addition, any volume shipments will need to consider operational restrictions caused by steep grades, particularly on the final stages of the rail route into Skagway

Other important issues that will need to be dealt with in any terminal expansion involving volume transportation movements include satisfying a high level environmental impact approval process in an environmentally sensitive area, meeting Coastal Zone Management Plan requirements and obtaining approval from the City (with civic sentiment reportedly split 50/50 with respect to industrial development).

Skagway, because of its history and location presents unique challenges and unique opportunities for port development. Key to terminal expansion will be addressing these unique issues and developing the right economic business justification and political will to support terminal projects which can facilitate regional resource and industrial development.

3.3 Port of Haines

3.3.1 Current Activity

The Port of Haines is located close to Skagway, however land access to the Haines Southeastern Alaska and Yukon catchment area is considerably less direct. The distance by road to Haines is 150 miles (240 km) longer than the highway route to Skagway and there is no rail service, the closest rail point being Fairbanks, a distance of over 750 miles (1,200 Km). Proposed Alaska Railroad expansion to Delta Junction and onward would considerably reduce this distance.

The port can accommodate large ocean going vessels in two separate port areas, an 'inner' harbour located in Portage Cove, a large bay adjacent to the City of Haines, and

an 'outer' port area located on Lutak Inlet in an industrial zone a few miles by truck route from the city centre. Cruise ship, tourist, fishing and pleasure craft facilities are located in the Portage Cove city area while commercial industrial terminal activity is located on Lutak Inlet. This port configuration eliminates conflict between industrial port activity and tourism, cruise and recreational activity.



All commercial freight is handled at the Lutak City Dock, a modern facility which services the regularly scheduled Alaska State Ferry calls, tanker barge shipments of petroleum products which are distributed to trucks by Delta Western from their on-dock tank farm and AML Ro / Ro shipments of containers and general cargo. Utilization of the dock is low.

AML shipping statistics are proprietary. However, an estimate of this traffic to Haines is up to 5,000 TEU annually which is equivalent to approximately 40,000 tonnes. Current fuel volume through the dock is 30,000 tonnes per year as reported by Delta Western.

3.3.2 Capacity / Potential

Lutak City Dock

With its current low utilization, this terminal has significant capacity for growth of its existing ferry and barge traffic. In addition, the alongside draft and length of the berth is suitable for Panamax vessels. This, coupled with the approximately 10 acres (4 ha) of available dock space for staging creates potential for significant container, general cargo or project cargo growth (such as steel pipe). Alternately, this space could support a limited opportunity to develop capacity for small annual throughput volumes of a higher value natural resource bulk product, depending on compatibility.



US Army Tank Farm Property and Vessel Loading Berth

In theory, the large land base of this abandoned tank farm could be of interest for terminal development. However, the potential for bulk commodity terminalling or handling other commercial cargo here is extremely limited. The contaminated abandoned tank farm land base is undergoing environmental remediation; the land area is on sloping terrain, upland and a considerable distance from the berth. Further the berth itself has no useable surface area as it was constructed only for pipelined movement of liquids with no capability to handle bulk, break bulk, containers, project or general cargo.



Chilkoot Lumber Property

This 20 acre (8 ha) abandoned lumber mill waterfront site has a deep water dock, which in the past handled up to 44,000 tonne vessel shipments of lumber, is potentially capable of handling Panamax bulk vessels. The property, along with its long term leases is for sale, along with a separately owned adjacent 20 acre (8 ha) waterfront land parcel also zoned for industrial use. This waterfront land base could physically support terminal development capable of handling large

volumes of outbound bulk natural resources, general and project cargo such as steel pipe, and/or containers. Depending on product mix and variety it would not be unreasonable to potentially accommodate up to five million tonnes per year of bulk commodities, and / or up to 500,000 TEU's of containers annually or equivalent general or project cargo.



Original Chilkoot Lumber Property, now abandoned

3.3.3 General Port of Haines Expansion Issues

With separation of cruise, tourism and recreational activity from industrial freight movement in the Port of Haines, the many challenges created by urban proximity and conflict with tourism and recreational economic activity are minimized or eliminated. Major issues that do arise at Haines in a port expansion context include the extra road distance to reach the Port from its catchment area (compared to Skagway) and the current lack of rail access which would be important to service any higher volume resource or freight movements.

4.0 Port Group Area III Hyder, Alaska / Stewart, BC, Prince Rupert, BC, Kitimat, BC

4.1 General Description

The ports in Port Group Area II, located in Northern British Columbia and in the case of Hyder / Stewart, on the Northern British Columbia / Alaska border, service an economic catchment area which includes North and Central BC, the Southern Yukon and Southeast Alaska. With the exception of Hyder / Stewart, which has only highway access, these ports are connected by both highway and by rail to the CN North American system. All three ports have deep sea vessel access and all have both existing capacity available and potential to expand.

Port Group Area III is located on the Eastern reaches of the study region. It is a very large catchment area from Watson Lake in the Northwest to Fort St John and Prince George on its Eastern reach.

This catchment area is served by the well developed Prince Rupert and Kitimat locations in the Highway 16 / CN Northern line corridor and Hyder / Stewart in the relatively undeveloped Cassiar Highway Region. Prince Rupert and Kitimat can be reached by truck over Highway 16 and by rail to the CN Mainline. Hyder / Stewart can be reached by a connecting road from Mezziadin Lake on the Cassiar Highway; however lack of rail service limits development potential.

4.2 Port of Hyder / Stewart

The Ports of Hyder, Alaska and Stewart, British Columbia are essentially one location as illustrated by the photo below taken in 1926.



4.2.1 Current Activity

The Ports of Hyder and Stewart are located on either side of the Alaska / BC border and are considered here as a single bi-national port connected by common highway infrastructure to BC, Alaska and the Southern Yukon. This unique bi-national situation is underscored by the fact that Hyder is exempt from the US Jones Act. (The US Jones Act dictates that vessels sailing from one US port directly to another US port must be flagged in the United States and have American crews).

The only terminals in the port are a bulk loading terminal and a barge ramp, both in Stewart. In addition, raw logs are loaded to anchored barges or vessels from log booms assembled in the channel off Stewart.

Stewart Bulk Terminal is privately owned and currently handles close to 200,000 tonnes of bulk mineral concentrates delivered by trucks from the Eskay Creek and Huckleberry mines both in Northern BC. The Cassiar / Arrow Barge Ramp is currently abandoned, however was used to handle occasional barge shipments of project cargo and local re-supply materials. Other than a government pier-type wharf, there are no terminal facilities at Hyder.

4.2.2 Capacity / Potential

Depending on the number of grades involved, Stewart Bulk Terminal can handle up to an estimated 300,000 to 350,000 tonnes of concentrate annually through the existing facility. Assuming additional mineralization exploration allows the Huckleberry Mine copper concentrate shipments to continue beyond 2008, and with the announced decline in Eskay Creek production over the next two years, this terminal should have capacity for at least 150,000 tonnes per year more concentrate. A number of proposed mining developments in Northwest BC could utilize this capacity.

Expansion beyond this will be limited by the lack of available land on which to construct additional bulk storage and handling facilities. In addition, major expansion would need to include accommodation for larger bulk vessels and faster shiploading, particularly for higher volume bulk shipments such as coal. Significant growth also raises the possibility of more stringent environmental protection standards should throughput volumes and exposures increase significantly from present levels.



Stewart Bulk Terminal

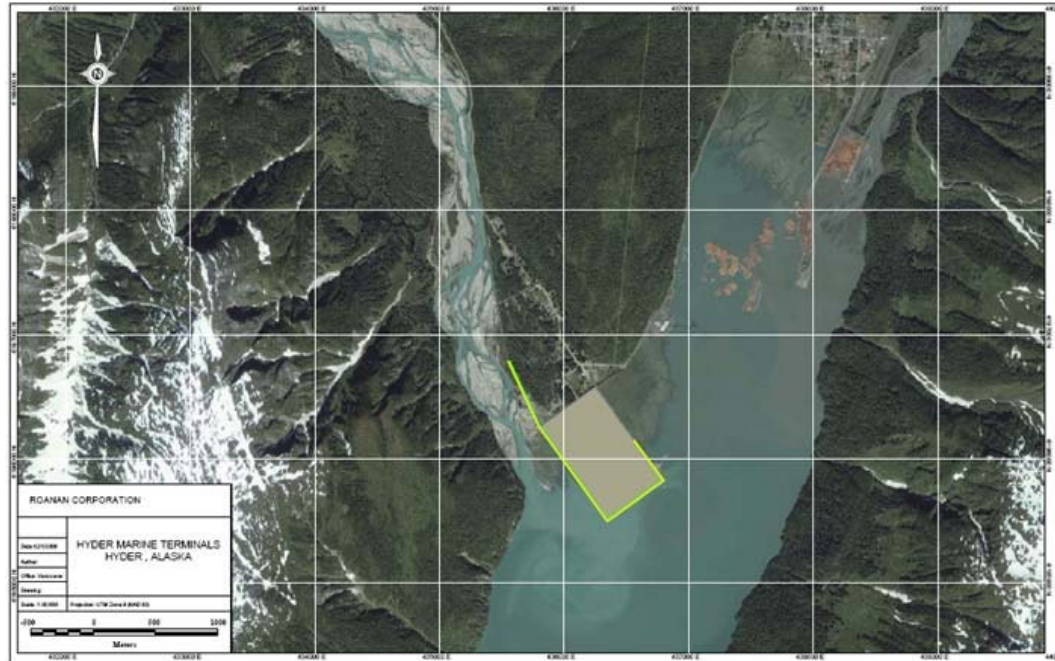
There are no effective constraints to growth over the Cassiar Barge Ramp, particularly given the availability of industrial land for dry land log sorting.

A concept calling for the construction of a multi-purpose bulk and project cargo terminal in Hyder is underway and in the preliminary engineering development stage. This project involves creation of a 125 acre (50 ha) site which would be designed for rail and truck service to and from storage and a deep sea berth capable of handling up to two Handysize vessels, one Capesize ship or one Post Panamax container vessel.



Hyder Government Dock

Tonnage capacity is dependent on the range and mix of commodities involved - the proposed land base could accommodate storage for over 500,000 tonnes of coal supporting annual throughput volumes in excess of six million tonnes of coal, plus 1.5 million tonnes of mineral concentrates, at least 500,000 tonnes of project or general cargo inbound and theoretically up to 1.5 million TEU's of containers assuming storage and staging on 50% of the available land area. The major challenge for this development will be sufficient committed tonnage to support an investment estimated at up to US\$ 100 million (US\$ 30 million to \$40 million for the base facility plus transportation access and other infrastructure costs)



Important issues that apply to expansion at both Stewart Bulk Terminal and the Hyder terminal project include the lack of rail access (a proposed rail link North from Hyder could cost an estimated US\$300 million / US\$500 million), increased truck traffic through the centre of Stewart and the extreme winter conditions on the 45 miles (72 km) of highway between Mezziadin Junction and Hyder / Stewart.

4.3 Port of Prince Rupert

4.3.1 Current Activity

The Port of Prince Rupert has several terminals and industrial marine facilities located in extensive inner and outer harbour areas. These include a large bulk terminal and a grain terminal (both modern and high capacity) intermodal and ferry docks plus new cruise ship terminals. In addition, conversion of Fairview, a former bulk / break-bulk terminal to a major container terminal, is under development.

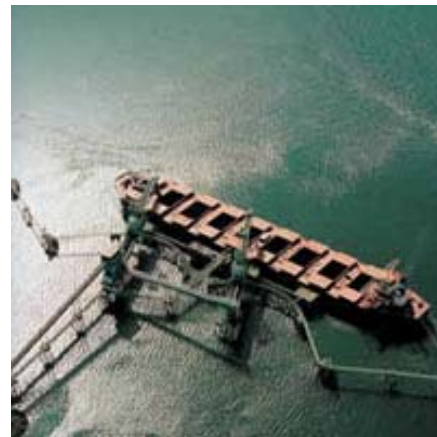
All major terminals in the Port have both highway access and CN Northern mainline rail access to the North American rail system. The port has excellent deep sea vessel access and all major terminals can handle the largest ocean going vessels. The size of the port and its extensive land base ensures little or no conflict between freight and cruise

ship or ferry passenger activities and provides significant opportunity for terminal and industrial development.

Port of Prince Rupert terminals of resource development interest to Alaska and the Yukon are the major Ridley Island bulk terminal and, to a lesser extent the intermodal facilities in the inner port area. Two intermodal terminals plus a Ro / Ro ferry terminal provide scheduled intermodal and vehicle service to various points including Alaska ports and all have significant upside capacity to meet any foreseeable demand. Ridley Coal Terminal, designed for at least 16 million tonnes throughput annually is handling less than 3 million tonnes of coal at present. The Prince Rupert Grain terminal is also running far below its 7 million Tonne annual capacity with volumes of 1 to 2 million tonnes per year. Construction has recently commenced on the former Fairview multi-product bulk terminal to become a 500,000 TEU per year container terminal in its initial phase.

4.3.2 Capacity / Potential

With its 16 million tonnes annual capacity (expandable to 26 million tonnes) and with potential coal volumes by 2007 of up to approximately 6 million tonnes, Ridley Coal Terminal has existing capacity for an additional 10 million tonnes and potential for up to a total of 20 million additional tonnes of coal or carbon compatible bulk products. 80% completed Liquid Sulphur facility constructed on the Ridley Coal Terminal site is unlikely to be finished; there is no market for available ocean carriers for molten sulphur in the Pacific, sulphur forming facilities need to be installed in the site, sulphur is incompatible with coal and vice versa, and finally a major new sulphur forming facility is being designed North of Edmonton to accommodate growing sulphur production.



Ridley Coal Terminal

The Skeena Cellulose Mill in the Port of Prince Rupert has been in receivership for several years and negotiations are ongoing for its sale. The dock, which is part of the mill, has the capability of handling a 30,000 DWT Handysize ship however, depending on disposition of the company, potential for general or project cargo here is limited as the dock apron area is small and adjacent to the mill.

There are several development sites in the Port of Prince Rupert which have been considered for new terminals. In particular, preliminary design work has been completed for a multi-purpose liquid and dry bulk terminal on the South Kaien Terminal Property which would be connected to the Ridley Island access road and CN Rail. Concepts here

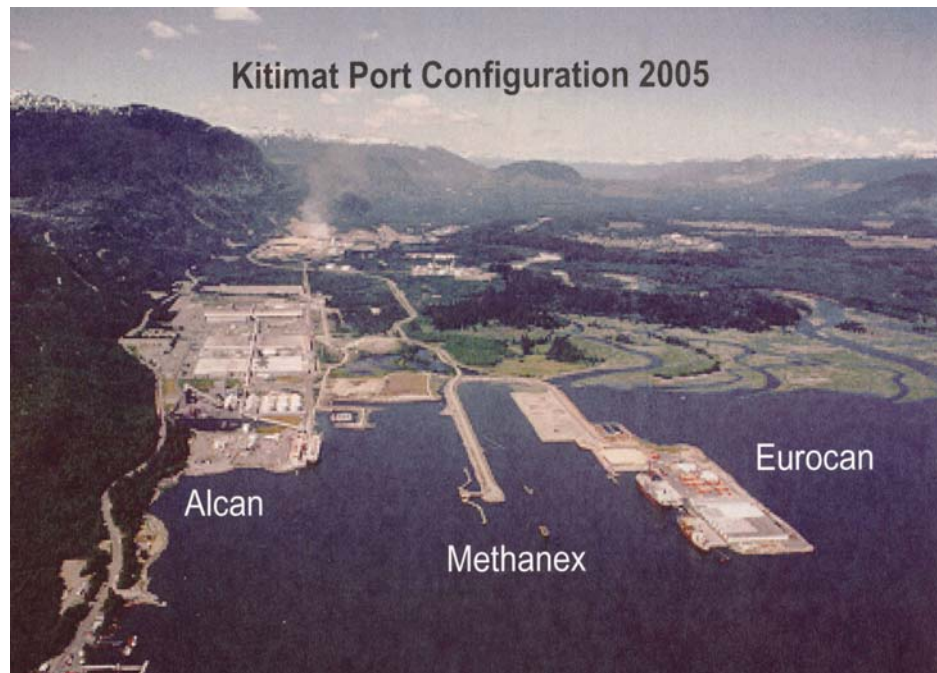
have included a three berth terminal capable of handling up to six million tonnes per year of liquid and dry products.

The major issue for Prince Rupert terminal lying from an Alaska and Yukon resource development perspective is the long distance to the Port of Prince Rupert and the indirect highway routing involved. The present lack of a rail link to CN Rail would be addressed by the Alaska Canada Rail Link Study.

4.4 Port of Kitimat

4.4.1 Current Activity

This private port consists of three private bulk terminals serving associated manufacturing plants and a private barge ramp. The port is at the head of a protected inlet, is accessible to large deep sea ocean carriers and is linked to the hinterland by road and a main branch rail line connecting to the CN Northern main line.



The Alcan Terminal is located next to Alcan's aluminium smelter complex and is used exclusively to handle major raw material imports and finished product exports for this world scale facility.

The Methanex liquid terminal was designed to handle exports by Methanex of methanol from its upland methanol plant however, with current and planned closures of methanol production in Kitimat and Alberta, the facility is being employed for vessel imports of methanol and possibly condensates, by rail to Alberta.

The Eurocan Pulp and Paper mill includes a two berth terminal which is underutilized due to a reduction in forest product shipments, principally lumber and wood chips. The 200/250,000 tonnes of pulp annually produced at the mill can easily be accommodated on the one berth adjacent to the 500,000 sq. ft. (49,500 sq metre) pulp storage warehouse leaving one berth, a Ro / Ro barge loading ramp and open storage area not in use.

The Rivtow Marine Barge Ramp handles weekly barge service to/from Vancouver and occasional project cargoes.

4.4.2 Capacity / Potential

Of the existing facilities, the Alcan Terminal is an integral part of the adjoining aluminium smelter with a high utilization rate and does not represent potential for new outbound resource or inbound facilitating project cargoes. The Methanex terminal is being redeployed to handle inbound methanol and possibly condensate imports and is unsuitable for dry bulk or general/project cargoes. The Rivtow Marine Barge Ramp has low occupancy levels with potential for significantly higher throughput volumes.

The Eurocan Terminal, with its barge loading ramp, available berths, one capable of receiving up to a 50,000 DWT Panamax size vessel, and 7 to 12 acres (2.8 to 4.8 ha) of available and adjacent open storage area, does have potential to handle additional freight volumes. West Fraser Timber, owners of the facility, have sought additional cargo for the terminal however potential identified to date has been either incompatible with existing shipments of pulp (i.e. cargo must be clean with no possibility of dust borne particulate escape) or not capable of generating sufficient terminal handling revenue for West Fraser. The revenue requirement may limit the possibility for compatible smaller volume bulk product exports at this site due to the relatively low unit values involved and their need for low terminal handling rates.

However this terminal does represent definite potential for project or general cargo with volumes only limited by staging requirements. A challenge for some potential shippers to utilizing this potential may be the current lack of a direct rail connection. However, for sufficient volume over time; a short rail extension may be possible from the existing CN Rail service to the upland Eurocan mill or the other nearby Port of Kitimat terminals.



Port of Kitimat

As with Prince Rupert, Kitimat's biggest disadvantage from a Yukon and Alaska point of view is its distance and at present, the lack of a Northern rail link.

5.0 Conclusions – Multimodal Port Access Operations Evaluation

5.1 General Conclusions

Resource development in Alaska and the Yukon will be dependent on the availability of cost effective transportation to reach world markets, largely offshore. This requires access to all year tidewater ports capable of providing the marine terminal link between land transportation modes and ocean freight.

Today there is, or could be, plenty of port and terminal capacity to handle any level of intermodal volumes that could reasonably be anticipated to service resource developments in Alaska and the Yukon. However, there is insufficient bulk marine terminal capacity to support the expansion of bulk natural resource shipments that would be expected.

The development of needed bulk commodity terminal capacity to handle large volumes of natural resources directed to the closest tidewater terminal can facilitate the economic case for the Alcan RailLink, particularly modular elements of the project if investment decisions on port expansion are taken from an overall logistics perspective.

5.2 Conclusions of Port / Terminal Operations Evaluation

This report reviewed all Southern Alaska and Northern British Columbia ports and terminals within the economic catchment areas of South and Central Alaska and South and Central Yukon. As outlined above, additional existing intermodal capacity is not an issue in any of the port catchment areas. Those ports and terminals which can play a significant role in facilitating support of, or shipments from current or new Alaska and Yukon resource developments by creating significant new capacity for intermodal or bulk shipments, include the following:

Port Group Area I **Port Mackenzie and the Port of Anchorage** offer considerable potential for natural resource marine terminal expansion, particularly if viewed as complementary ports. Depending on projected bridge and rail access developments, Port Mackenzie could be developed into a major bulk handling port for the region.

Port Group Area II Potential exists to create a bulk natural resource handling capability in the **Port of Skagway**. This will require significant re-investment at the Ore Dock to gain minimal capacity, or major investment to create meaningful bulk and / or intermodal capacity needed for multiple resource projects. In addition, the unique opportunity to employ available upland property in conjunction with the existing White Pass and Yukon Rail Dock could add substantial multimodal capacity for special project cargo such as steel pipe. In either case, major economic, environmental and operational challenges unique to Skagway will need to be addressed.

Development potential exists for a major industrial bulk terminal in the **Port of Haines**. This should be viewed in the context of balancing the port infrastructure advantages of Haines against the lack of rail access and longer road distance compared to Skagway. In turn, solutions to the lack of, or limitations to, rail

access may be considered in support of the Alcan RaiLink context.

Port Group Area III

Existing bulk terminal capacity for mineral concentrates exists at **Stewart** and a concept to create a major multi-product and bulk terminal at adjoining **Hyder** has been proposed. Distance and the lack of rail access to the Hyder / Stewart area could be reduced with a North-South rail link depending on routing.

Ridley Coal Terminal in the **Port of Prince Rupert** is considerably underutilized with potential to handle an additional 10 to 20 million tonnes of coal or carbon compatible bulk resource shipments.

In addition, the **Eurocan Terminal** in the **Port of Kitimat** represents potential to handle significant intermodal general or project cargo volumes inbound to service Northern resource development.

The disadvantage of the long distances involved for potential Yukon and Alaska shippers to use existing terminal infrastructure in the Ports of Prince Rupert or Kitimat could be offset by new North-South rail access.

Appendix – Map of Port Group Catchment Areas

<Electronic version of the Map available: P50854_W1_06AJan25_PORTS.pdf>

Glossary of Vessel Size Groups

Vessel Size Groups in deadweight tons (DWT). Major ship size groups include:

- **Handy and Handymax:** Traditionally the workhorses of the dry bulk market, the Handy and more recent Handymax types remain popular ships with less than 50,000 DWT. This category is also used to define small-sized oil tankers.
- **Panamax:** Represents the largest acceptable size to transit the Panama Canal, which can be applied to both freighters and tankers; lengths are restricted to a maximum of 275 meters, and widths to slightly more than 32 meter. The average size of such a ship is about 65,000 DWT.
- **Capesize:** Refers to a rather ill-defined standard which have the common characteristic of being incapable of using the Panama or Suez canals, not necessarily because of their tonnage, but because of their size. These ships serve deepwater terminals handling raw materials, such as iron ore and coal. As a result, "Capesize" vessels transit via Cape Horn (South America) or the Cape of Good Hope (South Africa). Their size ranges between 80,000 and 175,000 DWT.

Source: UNCTAD (2000) Review of Maritime Transport, Lloyd's Register information sheet.