



Alaska Canada Rail Link

Traffic Data Development for Regional Re-supply (Alaska)

Work Package: A-1 (A)

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To: Kells Boland – Project Manager - Alaska-Canada Rail Link

Subject: Work Package A1 (a) – Traffic Data Development for Regional Re-supply (Alaska)

Attached is the report of QGI Consulting for the above noted work package within the market analysis phase of the ongoing feasibility study for the proposed Alaska-Canada Rail Link.

The principal objectives of this work assignment were to:

- Identify the principal supply chains serving the Alaska marketplace for regional re-supply commodities;
- Identify the principal providers of transportation services;
- Identify the major origin-destination flows of goods;
- Estimate total volume of freight moving into the Alaska market via each supply chain channel;
- Estimate transportation rates for the movement of goods into this market.

Our freight estimates are based on a combination of publicly available data, summary data provided by the Alaska Railroad Corporation specifically for the movement of rail cars via barge from Tacoma and Prince Rupert, and border crossing data for highway movements. The specific methodologies utilized in developing the estimated freight volumes are fully documented in the attached report. These freight estimates including volumes, timing, and feasibility based on competitive rail routings and rates will be validated during the course of the next phase of this assignment.

Sincerely,

Milt Poirier
Partner
QGI Consulting Ltd.

1.0 Transportation Services and Carriers

Inbound goods for regional re-supply to the State of Alaska are transported from Canadian and United States origins using a number of multi modal transportation services. Direct access to the Alaska market is limited to ocean and highway transportation with the former playing the pivotal role in the delivery of goods to support the Alaska economy.

Key transportation services supporting these supply chains include:

- Railcar barges operating from Tacoma, WA and Prince Rupert, British Columbia;
- Ocean vessels providing roll on / roll off services for highway trailers operating from Seattle / Tacoma, WA;
- Container vessels originating in Seattle / Tacoma, WA; and
- Highway truckload and less than truckload services.

Railcar barge movements destined to the Port of Whittier, Alaska connect with the Alaska Railroad for movement of goods to Anchorage, Fairbanks, and other inland destinations. Key transportation providers serving this market are Totem Ocean Trailer Express (TOTE), Horizon Lines, CN Aquatrain, and Lynden Transportation.

1.1 Totem Ocean Trailer Express (TOTE)

Totem Ocean Trailer Express (TOTE) is an Alaska based transportation company offering marine and land transportation services between the state of Alaska and the lower 48 U.S. states. TOTE is a subsidiary of American Shipping Group, a holding company owned by Saltchuk Resources. TOTE's service offering includes both marine and highway services operating between Tacoma, WA and Anchorage, AK.

Marine Services

TOTE operates a fleet of two ORCA and one Ponce class vessels in twice-weekly northbound and southbound service between Tacoma and Anchorage. The marine service is a roll on / roll off service for highway trailers and automobiles. The ORCA and Ponce class vessels have trailer capacities of 600 and 380 forty-foot equivalent units (FEU) respectively. Transit time between Tacoma and Anchorage ranges from 66-72 hours in each direction over a sailing distance of 1,450 nautical miles.

Non-Marine Services

Non-marine services include overland highway and intermodal connections throughout the lower 48 states, Canada, and Alaska. The Alaskan line haul division of TOTE delivers directly to various

Alaskan destinations including Fairbanks, Valdez, and the Kenai Peninsula using a fleet of more than 1,775 trailers comprised of dry trailers, refrigerated trailers, heated "insulated" trailers, dual temperature combos, drop frames, lowboys, and flatbeds and tankers. In conjunction with the Alaska Railroad TOTE provides trailer on flat car (TOFC) service from Anchorage to Fairbanks.

TOTE barges are capable of loading a broad range of trailer configurations ranging from 28' to 53' trailers with payload capacities between 24 – 35,000 lbs. For analytical purposes we have assume an average 40-foot trailer with payload capacity of 30,000 lbs or 15 short tons.

Estimated Freight Capacity

Based on current sailing schedules¹ it is estimated that this service offers capacity of approximately 4,720 forty-foot equivalent units (FEU) per month. At an average payload weight of 15 short tons per FEU this would represent annual capacity of 70,800 tonnes per month or some 850,000 short tons per year.

1.2 Horizon Lines

Horizon Lines Inc., based in Charlotte, NC, is the United States leading Jones Act² container shipping and logistics company, accounting for approximately 37% of the total U.S. marine container shipments between the continental U.S. and the three non-contiguous Jones Act markets of Alaska, Hawaii and Puerto Rico. In 2003 the Carlyle Group, a global private equity firm, purchased the Horizon Services Group of CSX Lines and renamed it Horizon Lines LLC.

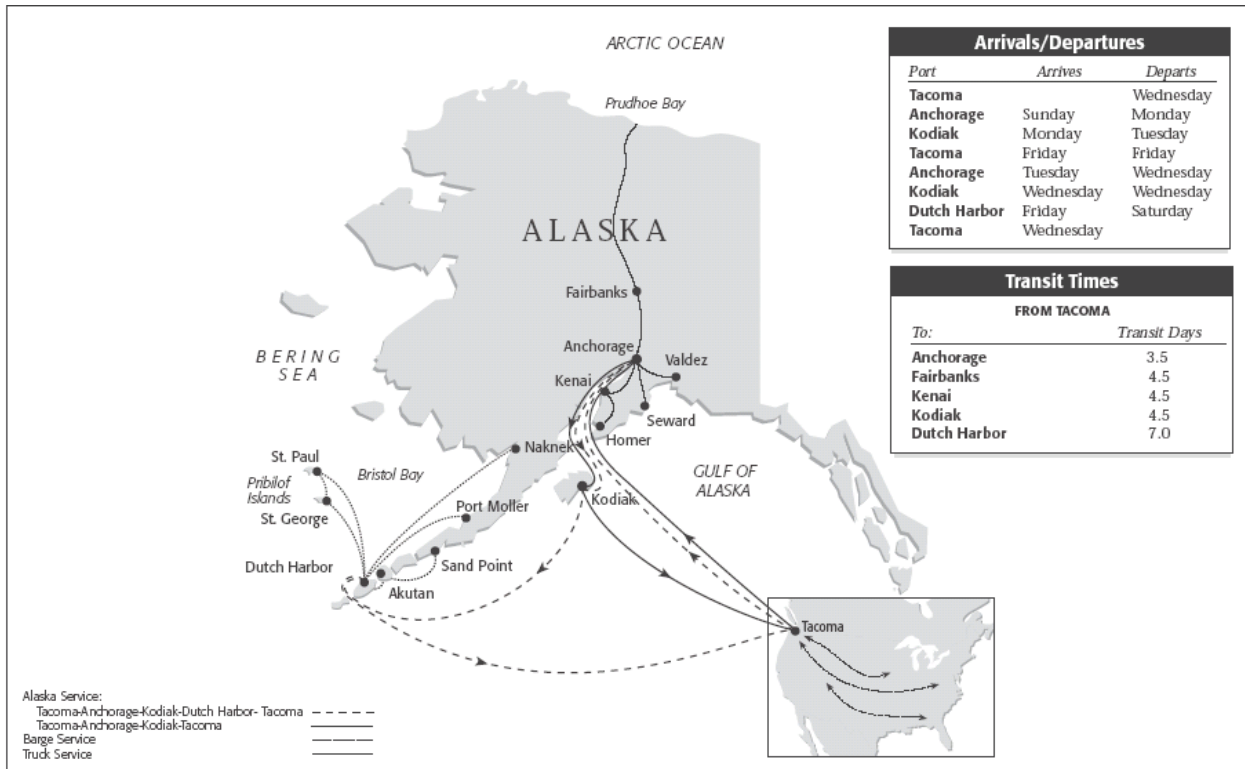
Alaska Service

Horizon Lines provides year round service between Seattle and Alaska using D-7 class container vessels. Horizon operates twice weekly service from Tacoma directly to Anchorage with a follow on call to the island Port of Kodiak. One vessel per week then makes a call at Dutch Harbor. Truck and barge services connect these three principal destination ports with surrounding locations including Akutan, Bristol Bay, the Pribilof Islands, King Cove, Sand Point, the Kenai Peninsula, Prudhoe Bay, Eagle River, Fairbanks and Palmer. Transit time between Tacoma and Anchorage is approximately three and one-half days. Horizon's service is depicted in Figure 1 below.

¹ Sailing schedule as published at <http://www.totemocean.com/shipping/s-init-tacoma.asp> for the month of February 2006.

² The Jones Act of 1920 requires that all cargo moving between U.S. ports be carried in ships which are U.S. owned, built, and flagged.

Figure 1 – Horizon Lines Service Map



Estimated Freight Capacity

The three line haul D-7 Class container vessels operating in the Tacoma to Alaska service are capable of carrying 740 40-foot containers (1480 TEUs). Horizon tariff rates are published with minimum weights in forty-foot containers ranging from a low of 18,000 lbs to a high of 45,000 lbs depending on the specific commodity. For analytical purposes we have assumed an average payload weights of 20,000 lbs per TUE or 40,000 pounds per FEU.

Published sailing schedules³ indicate a total of 104 sailings per year. Assuming average payloads of 10 and 20 tons per TEU and FEU respectively it is estimated that Horizon offers annual freight capacity of some 6,400 FEU per month (12,800 TEU) or 154,000 TEUs per year. This represents the equivalent of 1.5 million tons of freight capacity destined to the Alaska market annually.

³ Sailing schedule as published at http://www.horizonlines.com/si_sailingschedules.asp

1.3 Lynden Inc.

Lynden Inc. is the parent company of a family of transportation and logistics companies primarily serving Alaska and the Pacific Northwest. Lynden companies provide multi modal transportation services including air, marine, and land services to, from, and within the State of Alaska. Key transportation companies under the Lynden Group supporting the movement of goods inbound to Alaska include:

Alaska Marine Lines

Alaska Marine Lines (AML) provides twice per week barge services between Seattle and Southeast Alaska with scheduled sailings on Wednesdays and Fridays. The Southeast Alaska barge services a number of locations including Juneau, Ketchikan, Petersburg, Sitka, and Hake. AML barge services handle full container, less than container, refrigerated, and break bulk cargo. Principal customers consist of retail establishments such as grocery outlets involved in primary community re-supply commerce.

AML also services the Central Alaska market with weekly barge service between Seattle and Anchorage with over land connections to Seward, Kenai, and Fairbanks.

Figure 2 – Central Alaska Service

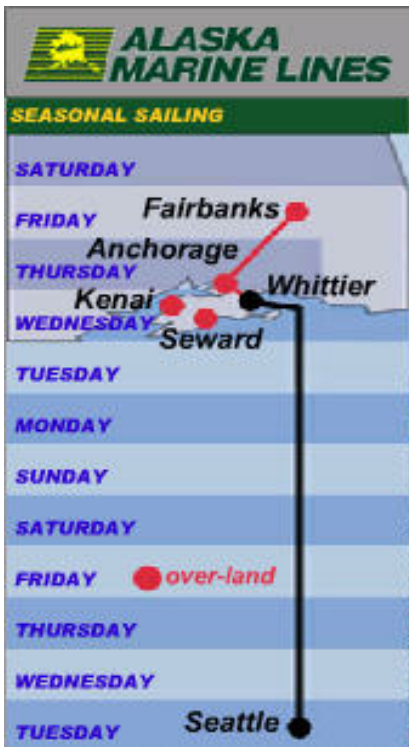
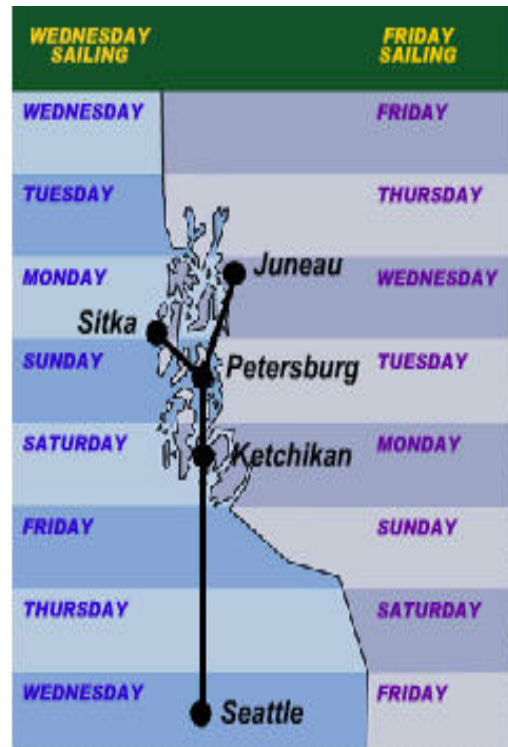


Figure 3 – Southeast Alaska Service



Alaska West Express

Alaska West Express (AWE) provides truckload transportation throughout the United States and Canada, specializing in shipments to and from Alaska. Alaska West Express is a leader in transporting liquid and dry-bulk products, hazardous and non-hazardous chemicals and petroleum products. AWE operates a rail terminal at Fairbanks offering product transfer services for liquid and dry bulk products serving primarily the oil and gas industry.

Lynden Transport

Lynden Transport is a complete multi-modal, regional, common and contract carrier primarily serving Alaska. Lynden Transport also provides LTL cargo service on motor-water-motor routes using steamships, barges, and ferries. Lynden Transport has truckload capabilities for dry van, refrigerated, flatbed and heavy-haul commodities on both water and highway routes.

Lynden Transport offers a truckload service to the Alaska market from a number of origins including Seattle, California, Alberta, and Texas.

Alaska RailBelt Marine

Alaska RailBelt Marine operates scheduled, once per week railcar barge service between Seattle and Whittier, Alaska. This service operates in partnership with the Alaska Railroad providing freight service to south central Alaska. ARM operates the service using three rail barges with estimated rail car capacities of forty (40) cars each plus deck space for break bulk and container cargo.

Estimated Freight Capacity

The Alaska Marine Belt rail barge - similar to that operated by CN Aquatrain – has an estimated capacity of forty (40) rail cars per barge. Based on an estimated 50 sailings per year with average payloads of 82 tons per rail car this service offers equivalent inbound freight capacity of 161,600 short tons per year.

Alaska Marine Lines container barge service operates twice weekly to Southeast Alaska and once weekly to Central Alaska for total service frequency of three times per week or twelve per month. Our research indicates that a total of thirteen container barges are owned and operated by Alaska Marine Lines as shown in Table 1 below⁴.

⁴ Source: Maritime Business Strategies LLC – US Flag General Cargo Barges – October 2005

Table 1 – Alaska Marine General Cargo Barges

Owner	Home Port	Vessel Name	Type	Build Date	GT	TEU
Alaska Marine Lines	Juneau AK	Anchorage Provider	Containers	Dec-00	6,092	264
Alaska Marine Lines	Juneau AK	Fairbanks Provider	Containers	Feb-01	6,092	264
Alaska Marine Lines	Juneau AK	Whittier Provider	Containers	Sep-01	6,092	264
Alaska Marine Lines	Juneau AK	Southeast Provider	Containers	Apr-02	5,524	800
Alaska Marine Lines	Juneau AK	Stikine Provider	Containers	May-03	5,524	800
Alaska Marine Lines	Juneau AK	Sitka Provider	Containers	Jun-04	5,524	800
Alaska Marine Lines	Juneau AK	Tongass Provider	Containers	May-94	3,537	700
Alaska Marine Lines	Juneau AK	Taku Provider	Containers	Jan-96	3,537	700
Alaska Marine Lines	Juneau AK	Chatham Provider	Containers	Jun-73	2,985	510
Alaska Marine Lines	Juneau AK	Chichagof Provider	Containers	Jun-73	2,985	510
Alaska Marine Lines	Juneau AK	Alaska Provider	Containers	Dec-84	2,146	435
Alaska Marine Lines	Juneau AK	Western Provider	Containers	Jun-82	2,112	435
Alaska Marine Lines	Juneau AK	Baranof Provider	Containers	Aug-81	1,257	200

Assuming a round trip transit time of 15 days per voyage each barge would be capable of a maximum two sailings per month – requiring a minimum of 6 barges to meet scheduled services. In calculating the available freight capacity offered in the Tacoma – Alaska trade we have assumed that the largest capacity barges would be used. These six barges have a total capacity 4,310 twenty-foot equivalent units. Based on AML published sailing schedules for 2005 and 2006 it is estimated that this service provides 41,600 and 72,000 TEUs of freight capacity annually into the Central and Southeast Alaska markets respectively. Using an assumed average payload of ten (10) short tons per container this represents freight handling capacity equivalent to approximately 1.1 million tons per year.

1.4 CN Aquatrain

AquaTrain, operated by Foss Maritime⁵, provides marine services for rail car movements between the State of Alaska and Canada and the lower 48 states. The service operates one of the world's largest railcar barges, accommodating 45 railcars on eight tracks. The service is integrated to CN Rail's North American network and services shippers of bulk products serving the Alaska market principally with industrial commodities such as fertilizers, sand, methanol, salt, lumber, and petroleum products. The Aquatrain service connects to the Alaska Railroad at Whittier, AK for rail delivery to inland points. Transit time over the 830 nautical mile voyage is approximately four days.

⁵ Foss Maritime was purchased by Saltchuk Resources in 1987. Saltchuk is also the parent company of Totem Ocean Trailer Express.

Estimated Freight Capacity

CN Aquatrain operates an average of thirty-five (35) barge sailings per year from Prince Rupert, British Columbia to Whittier Alaska. With a nominal barge capacity of 45 rail cars per sailing it is estimated total annual movements are in the order of 1,575 rail cars per year. Based on an average per car payload of 92 ton per rail car it is estimated that CN's Aquatrain service can handle approximately 145,500 short tons of freight into the Alaska market annually.

1.5 Summary Freight Capacity Calculation

Based on known service plans and assets serving the Alaska market using marine services it is estimated that these service providers offer total freight capacity into this market of approximately 4.7 million short tons annually.

The majority of capacity is dedicated to serving the Central Alaska market, principally through the Ports of Anchorage and Whittier. The Port of Whittier while served weekly by Alaska Marine Lines barge service is predominantly used for delivery of railcar barges via the ARM and Aquatrain services connecting with the Alaska Railroad for movement inland.

The balance of the freight moving into this market is handled using the railcar barge services offered by Alaska Rail Belt Marine (Lynden) and CN Aquatrain. It is estimated that this represents approximately 3600 – 3700 railcars per year or some 313,000 tons of freight.

Table 2 below provides a summary of estimated freight capacity by destination region and service type.

Table 2 – Summary Marine Freight Capacity Serving Alaska

Service Area	Service Type	Provider	Annual Capacity	
			TEUs	Tons
Central Alaska • Anchorage, Fairbanks, Kenai, Seward, Whittier	Container Barge	AML	41,600	416,000
	RO/RO Vessel	TOTE	113,280	1,700,000
	Container Vessel	Horizon	153,920	1,530,000
	Railcar Barge	ARM	2,080	168,500
	Railcar Barge	Aquatrain	1,575	145,000
Est. Freight Capacity to Central Alaska	VFC (TEUs)		308,800	3,646,000
	Railcars		3,675	313,500
		Total		3,959,500
Southeast Alaska • Juneau, Ketchikan, Petersburg, Sitka, Haines, Skagway (Whitehorse)	Container Barge	AML	72,000	720,000
Total Est. Marine Based Freight Capacity				4,679,500

Table 3 below provides a detailed breakdown of the marine services currently moving freight to the Alaska market and the estimated capacity of these services.

2.0 Freight Volumes

2.1 Methodology

A key objective of this analysis is to identify the estimated inbound freight volumes to the State of Alaska using all surface transportation modes. This includes marine transportation for vans, trailers, and containers as well as highway transportation and marine services for delivery of railcar traffic. More specifically this work element seeks to identify the freight traffic related to regional re-supply. The Terms of Reference define regional re-supply volumes as those “...required for routine support to ongoing public and private sector activity in the Alaska regional economy. Regional re-supply includes inbound construction materials, consumer goods, repair parts, equipment, vehicles, food and fuel.”⁶

One challenge encountered in estimating the annual freight volumes for these commodities across all surface modes has been the inability to obtain statistical information for common time periods for each mode. Key flows examined and sources of freight movement data used for this analysis include highway transportation, railcar barge traffic, and marine based trailer and container movements.

Recognizing the discrepancy in the timing of the data a key assumption underpinning our analysis is the assumption that no significant changes have occurred in either the modal distribution of freight flows or in the total volumes of inbound freight between the years 2003 and 2005. Based on this we have used the most recent data for each transportation mode as the representative annual volumes being handled in these transportation corridors.

Following is a brief description of the information sources and base information gathered for each of these flows.

Highway Transportation

Highway movements into Alaska from the Yukon and origins south of the 60th parallel have been estimated using vehicle border crossing data obtained through Yukon weigh scales. These statistics have been cross-referenced with U.S. Bureau of Transportation Statistics (BTS) for inbound truck border crossing information to Alaska. The most recent statistics available for highway movements are for the year 2003.

⁶ As published at www.alaskacanadarail.org - Stage 1 Market Analysis, Work Breakdown Structure, Work Package A1 (a).

Ocean Transportation

Ocean transportation consists of three distinct supply chain arrangements including:

- Roll on / roll off (RO/RO) trailer servicing using ocean barges;
- Railcar barge service
- Container services using both vessel and barge operations

Railcar Barge Services

The CN Aquatrain that operates from Pr. Rupert, BC and Lynden's Alaska Rail Belt Marine service originating in Seattle/Tacoma handle all railcar barge traffic to the Port of Whittier. Freight estimates for these movements are based on rail handling data provided by the ARR based on their rail handlings for the year 2005.

Information provided by ARR was thoroughly sanitized and summarized prior to release to ensure that the confidentiality of specific shipper and rate information was preserved. ARR provided a summary file of rail handlings reflecting commodities handled, inland origin locations of rail-barge movements, number of railcars handled, and weight. The data did not identify the specific railcar barge service handling the freight and as such this has been estimated based on geographic origin of the traffic as compared to the existing North American railway network. Our principal assumption in this regard is that any freight originating at locations capable of being serviced by Canadian National Railways, whether in Canada or the United States, would move across their network to Pr. Rupert and via the Aquatrain service to Whittier. The estimated volumes by service were then crosschecked against the estimated capacity of each of these services for validation.

Container and Trailer Services

Two principal sources have been used to estimate the volume of ocean based container and trailer volumes namely, publicly available Port of Anchorage (POA) statistics⁷ and data and analysis extracted from the 1999 Port of Anchorage Master Plan. Publicly available statistics for the Port of Anchorage are limited to the period from 1996 to 2004. Key statistics provided by the Port include:

- Total tonnage by commodity moving through the POA (1996 – 2004)
- Approximate TEU count (inbound / outbound) through the POA (1996 – 2004)
- Container counts (inbound / outbound) through the POA (2003 – 2004)

⁷ As published at <http://www.muni.org/iceimages/port/2005TenYearTonnage.pdf>

These statistics were cross-referenced with information sourced from the Market Analysis section of the Regional Port of Anchorage Master Plan⁸.

Horizon Lines, Totem Ocean Trailer Express, and Alaska Marine Lines do not publicly disclose their specific freight handlings into the Alaska market. As such we have estimated the level of handlings for these traffic types based on our estimate of their handling capacity as discussed in Section 1. These capacities have been compared to the public tonnage statistics for the Port of Anchorage. For South Central Alaska freight estimates we again have looked at the capacity serving this market. A key point of validation in this instance is the estimate that Anchorage serves approximately 80% of Alaska population and handles an equivalent representative level of general containerized freight destined to the State.

2.2 Estimated Freight Volumes

Total inbound freight volumes to Alaska via all modes are estimated to be in the order of 4.0 million tons per year. Key assumptions used in deriving this estimate include:

- The Port of Anchorage handled 1.76 million tons of containerized cargo in 2004 which is estimated to represent approximately 90% of all merchandise cargo consumed in South Central and Inland Alaska⁹;
- AML is estimated to handle 360,000 tons of merchandise cargo in South eastern Alaska;
- Containerized volumes through the Port of Anchorage are estimated to be 90% inbound and 10% outbound¹⁰;
- Border crossing data estimates annual freight volumes of 117,000 short tons moving into Alaska northbound from origins in the Yukon and south of the 60th parallel¹¹; and
- Railcar barge marine traffic is estimated at 309,000 short tons per year based on 2005 handlings of the Alaska Railroad.

Table 4 provides a high level summary of these volumes. "Other" freight consists primarily of petroleum products (93%) and bulk cement delivered to the Port of Anchorage.

<u>Transportation Mode</u>	<u>Est. Annual Tonnage</u>	<u>Modal Share</u>
Railcar Barge	309,000	7.6 %
Container/Trailer Vessel/Barge	1,947,000	48.2 %
Highway Transportation	117,000	2.9 %
Other	1,660,000	41.3 %

Table 3 – Summary of Est. Inbound Freight

⁸ Regional Port of Anchorage Master Plan (1999) as published at <http://www.muni.org/port/expansion.cfm>

⁹ Regional Port of Anchorage Master Plan (1999) – Strategic Marketing Plan – Page 1.C-14, VZM/TranSystems – Northern Economics

¹⁰ Ibid

¹¹ P. Kishchuk – Regional Re-supply Analysis – Net Alaska Highway Tonnages (2003)

Freight classified under “Vessel / Barge” movements reflects tonnages associated with the movement of vans, trailers, and containers inbound to the Port of Anchorage as well as the estimated volumes moving via the AML barge system to Southeastern Alaska destinations including Juneau, Ketchikan, Petersburg, Sitka, and Haines. These volumes would include vehicle traffic that moves either in containers (autos) or as Ro / Ro traffic on the TOTE system.

2.2.1 Commodity Summary

General cargo moving in vans, trailers, and containers via the Port of Anchorage and Southeastern ports represents an estimated 1.947 million tons or 48% of total estimated inbound freight. Petroleum and petroleum based products is the second largest commodity at 1.537 million tons per year. It is estimated that almost all petroleum inbound to Alaska moves via Anchorage either in bulk or barrels.

As shown in Table 5 below the remaining freight is distributed across a wide range of commodity groups led by bulk cement, metal products, unspecified hazardous commodities, chemicals, and a variety of lumber and wood products. With the exception of bulk cement and general merchandise that move via the POA and highway respectively the remaining commodities move principally in rail cars using the CN Aquatrain and Alaska Rail Belt Marine systems.

Table 5 – Summary of Estimated Inbound Freight by Commodity and Mode

	(2004) Port of <u>Anchorage</u>	(2003) <u>Highway</u>	(2005) <u>Rail Barge</u>	S.E. Alaska <u>Ports</u>	<u>Total</u>
Vans/Flats/Containers	1,587,719	-	-	360,000	1,947,719
Petroleum Product (Total)	1,536,898	2,981	5,426	-	1,545,305
Cement (Bulk)	122,855	-	-	-	122,855
Metals and Products	-	-	88,819	-	88,819
Hazardous Commodities (unspecified)	-	-	75,612	-	75,612
General Merchandise	-	79,195	-	-	79,195
Lumber / Logs / Wood Products	-	156	38,503	-	38,659
Chemicals	-	-	36,585	-	36,585
Stone Clay Glass Prods	-	-	28,284	-	28,284
Motor Vehicles & Equipment	-	18,915	267	-	19,181
Nonmetallic Minerals	-	-	15,060	-	15,060
Agricultural Products	-	2,138	9,399	-	11,537
Other Miscellaneous Goods	142	1,873	4,731	-	6,746
Construction Materials	-	5,279	-	-	5,279
Iron / Steel / Pipe	-	4,142	-	-	4,142
Crushed Stone, Sand, Gravel	-	-	2,797	-	2,797
Household Goods	-	3,037	-	-	3,037
Waste & Scrap	-	-	2,430	-	2,430
Pulp and Paper Products	-	-	1,331	-	1,331
Total	3,247,613	117,715	309,246	360,000	4,034,575

2.2.2 Rail Barge Traffic

Traffic moving in rail cars via the two barge systems can be characterized primarily as industrial commodities. While the specific end use of these commodities can not be ascertained it is reasonable to assume they are used in support of various public and private sector activities including oil and gas exploration, minerals exploration and production, general industrial manufacturing, regional construction, and construction and maintenance of public infrastructure.

For the purposes of this analysis no attempt has been made to segregate commodities by end use and all volumes have been classified as part of regional re-supply volumes. Key commodities accounting for 91% of total traffic moving via rail barge are summarized below in Tables 6 and 7.

Table 6 – Summary of Major Commodities and Flows via Rail Barge

<u>Commodity Group</u>	<u>Comments</u>
Metals and Products	<ul style="list-style-type: none">• Mix of pipe, tubing, grinding media, and iron and steel rods likely to support mineral and oil and gas industries.• Sourced primarily from the U.S. Southwest (Texas, Alabama), Pacific Northwest (Washington, Oregon) and British Columbia
Hazardous Materials	<ul style="list-style-type: none">• Majority of specific commodities not identifiable• Sourced principally from Alberta (70%) and Texas (16%) consistent with the location of primary chemical producing infrastructure
Lumber & Wood Products	<ul style="list-style-type: none">• 80% of traffic consists of lumber and oriented strand board originating from mills in British Columbia and Alberta to support regional residential and commercial construction
Chemicals	<ul style="list-style-type: none">• More than 50% consists of various chloride products – potassium, sodium, and calcium.• 50% of traffic originates in Canada, principally in Saskatchewan
Stone, Clay, Glass	<ul style="list-style-type: none">• 70% hydraulic cement with nominal volumes of lime and clay likely in support of mining and oil and gas exploration and production activities• Traffic originates principally in Alberta and Washington (cement) and British Columbia (lime)
Nonmetallic Minerals	<ul style="list-style-type: none">• 99% barium sulphate originating principally in the State of Nevada• Used primarily for oil and gas drilling activities

Table 7 – Major Commodities Moving via Rail Barge Service

<u>Commodity Group</u>	<u>Commodity</u>	<u>Total</u>	<u>Percentage</u>	
			<u>Group</u>	<u>Total</u>
Metals and Products	Pipe or Tubing	37,881	43%	12%
	Grinding Balls	10,493	12%	3%
	Conduit Pipe	9,882	11%	3%
	Reinforcement Rods	8,006	9%	3%
	All Other (29)	22,557	25%	7%
Metals and Products Total		88,819		29%
Hazmat	Hazardous Materials	73,426	97%	24%
	Carbon Dioxide	1,911	3%	1%
	Ethylene Liquid	275	0%	0%
Hazmat Total		75,612		24%
Lumber / Wood Products	OSB	22,137	58%	7%
	Lumber	13,477	35%	4%
	All Other (5)	2,826	7%	1%
Lumber / Wood Products Total		38,440		12%
Chemicals	Potassium Chloride	8,754	24%	3%
	Sodium Chloride	8,082	22%	3%
	Calcium Chloride	3,769	10%	1%
	All Other (17)	15,981	44%	5%
Chemicals Total		36,585		12%
Stone Clay Glass Prods	Hydraulic Cement	19,293	68%	6%
	Lime	3,017	11%	1%
	Ground Clay	2,803	10%	1%
	All Other (6)	3,171	11%	1%
Stone Clay Glass Prods Total		28,284		9%
Nonmetallic Minerals	Barium Sulphate	14,970	99%	5%
	Pumice Aggregate	90	1%	0%
Nonmetallic Minerals Total		15,060		5%

Geographic and Service Breakdown

As noted earlier the raw traffic data provided by Alaska Railroad does not identify the source of the railcar barge traffic – i.e. whether the traffic moved via the CN Aquatrain or the Lynden Alaska Rail Belt Marine system. The split between the two transportation providers has been estimated based on the geographic origin of the movements cross referenced against the existing North American railway network assuming that origins accessible by CN Rail will move via the Aquatrain with the balance moving via ARM.

Table 8 – Estimated Volumes by Rail Barge Operator (Short Tons)

<u>Barge Service</u>	<u>Origin Country</u>		<u>Total Tons</u>	<u>Share</u>
	<u>Canada</u>	<u>United States</u>		
AK Rail Belt Marine	148	167,121	167,269	54%
CN Aquatrain	140,333	1,644	141,977	46%
Grand Total	140,481	168,765	309,246	

<u>Barge Service</u>	<u>Origin Country</u>		<u>Total Railcars</u>	<u>Share</u>
	<u>Canada</u>	<u>United States</u>		
AK Rail Belt Marine	2	2,071	2,073	57%
CN Aquatrain	1,520	20	1,540	43%
Grand Total	1,522	2,091	3,613	

As shown in Table 8 above our assumptions lead us to conclude that approximately 54% of volumes (tonnage) moves via the ARM system with the balance moving via the CN Aquatrain. This is in line with our estimate of the capacity of these two systems. Capacity has been estimated using the number of annual sailings, individual barge capacities, and average weight per rail car based on 2005 ARR actual traffic data. Our calculations would suggest capacities of approximately 161,000 ST for ARM and 145,000 ST for CN Aquatrain.

ARR traffic statistics enable us to identify source origins for these rail car movements. Based on our primary assumption of CN Aquatrain handling any traffic that CN Rail could originate we estimate that Aquatrain handles almost exclusively Canadian originated traffic while ARM handles almost exclusively U.S. originated traffic.

Canadian originated traffic is sourced almost exclusively from Western Canada with 50% of all such traffic originating in Alberta. Combined with British Columbia and Saskatchewan these three provinces account for 99% of Canadian traffic and nearly 45% of all rail traffic to Alaska.

Table 9 – Canadian Originated Railcar Traffic (Short Tons)

<u>Origin Country</u>	<u>Orig State</u>	<u>Tonnage</u>	<u>Railcars</u>
Canada	AB	73,183	795
	BC	51,205	560
	SK	14,278	145
	ON	1,519	18
	MI	148	2
	MB	148	2
Canada Total		140,481	1,522

United States originated traffic moving via Lynden's Alaska Rail Belt Marine system is sourced primarily from four states – Texas, Washington, Nevada, and Alabama. Expanding to the top twelve states as shown in Table 8 below accounts for 92% of all U.S. originated traffic.

Table 10 – United States Originated Railcar Traffic (Short Tons)

<u>Origin Country</u>	<u>Orig State</u>	<u>Tonnage</u>	<u>Railcars</u>	
United States	TX	46,104	560	} 67%
	WA	37,208	436	
	NV	15,163	168	
	AL	15,012	184	
	OR	7,779	96	} 92%
	LA	6,395	74	
	CO	6,227	77	
	WY	5,418	59	
	OH	4,402	91	
	CA	4,104	53	
	IA	3,526	40	
	OK	3,471	46	
Balance (21)	13,956	207		
United States Total		168,765	2,091	

2.2.3 Trailer and Container Traffic

Annual containerized cargo volume, that assumed to move in vans, trailers, or containers, is estimated to be approximately 1.947 million tons excluding highway movements. Additionally it is reasonable to assume that approximately 87,000 tons or 75% of the highway volumes move in container or trailer lots¹².

The majority (82%) of containerized merchandise is assumed to move through the Port of Anchorage. Publicly available freight tonnage statistics for the Port of Anchorage identify annual tonnage associated with the movement of vans, trailers, and containers in the order of 1.76 million tons (2004). The Regional Port of Anchorage Master Plan Study prepared by Northern Economics and VZM/Transystems in 1999 estimated that such tonnages through the POA were 90% inbound and 10% outbound. It is assumed that no structural changes in flows have occurred

¹² It is assumed that vehicles, machinery, construction materials and iron and steel pipe materials would move using flat deck equipment.

in recent years and on this basis we estimate total inbound traffic through the Port of Anchorage to be in the order of 1.588 million tons.

Our capacity calculations for the Southeast Alaska marine services of Lynden Transportation estimate total available capacity of 72,000 TEUs or 720,000 tons of freight annually. Lynden does not provide public data in this regard and our market research did not reveal any publicly available information regarding cargo movements through the ports of Juneau, Ketchikan, Petersburg and Haines – the principal destinations for AML’s weekly Southeastern Alaska barge service. We have conservatively estimated freight tonnages to these markets to be 50% of estimated capacity or 360,000 tons per year.

2.2.3 Highway Traffic

Based on border crossing data obtained through the analysis conducted by Vector Research for regional re-supply into the Yukon highway volumes are estimated to represent 117,000 tons per year or less than 3% of total estimated volumes. This data was cross-referenced with truck border crossing data obtained from the U.S. Bureau of Transportation Statistics. While the U.S. statistics indicated slightly higher border crossing volumes they provided no commodity breakdown or tonnages associated with these movements. Given the relative significance of these volumes in the overall tonnage equation it was felt that the discrepancy between the two sources was not significant enough to adversely affect total freight forecasts.

Highway traffic consists principally of general merchandise traffic (68%) and vehicles, machinery and equipment (16%). Other commodities include household goods, agricultural commodities, petroleum products, construction materials, and iron pipe and steel products.

Table 11 – Commodities Handled via Highway Movement

<u>Commodity</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>
Agricultural Products	2,389	2,386	1,552	2,138
Bus and Taxi Service	81	669	176	248
Construction Materials	3,947	4,783	3,589	5,279
General Merchandise	48,795	88,033	75,585	79,195
Household Goods	1,731	2,738	2,902	3,037
Iron, Pipe & Steel	4,409	6,854	6,062	4,142
Livestock	-	90	100	55
Mine Ore	-	343	-	-
Mobile Homes	153	151	108	235
Mobile Homes - Residential	381	305	550	744
Not specified	855	503	488	592
Petroleum Products	1,602	1,092	2,091	2,981
Timber	46	21	-	156
Vehicles, Machinery & Equip.	7,762	12,099	18,179	18,915
Other (misspecified data)	85	58	55	-
Total Inbound to Alaska	72,235	120,124	111,438	117,715

3.0 Transportation Rates

3.1 Methodology

Estimated transportation rates have been developed for movements via highway, container vessel, and trailer barge movements. No freight rate estimates have been able to be developed for the movement of railcars by rail barge either through the ARM or Aquatrains services. Further attempts will be made to secure rates for these movements in the Logistics Evaluation of Regional Re-supply movements in a subsequent phase of the market analysis.

Principal sources for transportation rate information include:

- Rate quotations from Totem Ocean Trailer Express for the movement of dry and refrigerated goods in trailers from Tacoma to Anchorage; and
- Review of publicly available tariffs for the movement of containerized cargo between Tacoma and Anchorage with Horizon Lines.

3.2 Estimated Transportation Rates

Full Trailer Loads Via TOTE

Two rate requests were submitted to Totem Ocean Trailer Express as follows:

1. 30,000 lb trailer load of dry goods Tacoma to Anchorage using TOTE supplied 40' trailer
2. 25,000 lb reefer load of frozen goods Tacoma to Anchorage using TOTE supplied equipment

Rate quotations provided by TOTE for these movements are shown in Table 12 below.

Table 12 – TOTE Freight Rate Quotations

Freight Charge Description	Dry Goods	Frozen Goods
Ocean Freight	\$ 3,450.0	\$ 4,400.00
Ocean Fuel Surcharge	\$ 603.75	\$ 770.00
Tacoma Arbitrary (drop and pick)	\$ 165.00	\$ 165.00
Local P&D Fuel Surcharge	\$ 28.88	\$ 28.88
Port Security Charge	\$ 40.00	\$ 40.00
Terminal Handling	\$ 132.00	\$ 110.00
Total Freight Charges USD	\$ 4,419.63	\$ 5,513.88
Per CWT	\$ 14.73	\$ 22.06
Total Freight Charges CDN@ \$0.825	\$ 5,357.13	\$ 6,683.49
Per CWT	\$ 17.86	\$ 26.73

The rate quotations solicited and provided by TOTE do not presume the origin of traffic outside the immediate Tacoma, WA region.

Container Movements Via Horizon

Transportation rates for the movement of containers via Horizon Lines were estimated based on review of Horizon’s publicly available tariffs accessible through its Internet website. A total of fifteen Horizon tariffs were reviewed covering a range of commodities including general merchandise, paper products, frozen goods, liquid in bulk tankers, foodstuffs, and groceries. Table 13 below provides sample rates for selected commodities. A full listing of rates reviewed are contained in Appendix A of this report.

Table 13 – Horizon Lines Sample Tariff Rates USD

Commodity	20 Ft Container			40 Ft Container		
	MWT	Per CWT	Container	MWT	Per CWT	Container
Paper Articles, NOS	30,000	\$ 8.26	\$ 2,478	40,000	\$ 8.26	\$ 3,304
Building Materials	36,000	\$13.72	\$ 4,939	40,000	\$ 13.72	\$ 5,488
Groceries Articles	36,000	\$11.38	\$ 4,097	40,000	\$ 11.38	\$ 4,552
Foodstuffs, Canned	36,000	\$11.02	\$ 3,967	40,000	\$11.02	\$ 4,408
<u>FAK Shipments</u>						
10+ shipments / mth	22,000	-	\$ 2,201	-	-	-
5-6 shipments / mth	22,000	-	\$ 2,260	-	-	-
2-4 shipments / mth	22,000	-	\$ 2,283	-	-	-
1 shipment / mth	22,000	-	\$ 2,339	-	-	-

These tariff rates do not include costs of inland transportation from origin to the Port of Tacoma (US Inland Arbitrary), applicable ocean and inland fuel surcharges (17% and 24% respectively), port security charges (\$40 per container), and terminal handling charges (\$0.44 cwt). Rates include free delivery to local Anchorage destinations with other inland destinations subject to Alaska Arbitrary Inland Charges.

By way of example Table 14 below shows the construction of an estimated through charge for movement of a 40 ft container of grocery articles from Tacoma to Anchorage assuming a minimum payload weight of 40,000 lbs. As the calculation shows the rates via Horizon are reasonably comparable to those quoted by TOTE for a similar movement falling within 6% of one another.

Table 14 – Sample Rate Calculation – Horizon Lines

Freight Charge Description	Dry Goods
Ocean Freight	\$ 4,552.00
Ocean Fuel Surcharge	\$ 773.84
Tacoma Arbitrary (drop and pick)	\$ -
Local P&D Fuel Surcharge	\$ -
Port Security Charge	\$ 40.00
Terminal Handling	\$ 176.00
Total Freight Charges USD	\$ 5,541.84
Per CWT	\$ 13.85
Total Freight Charges CDN@ \$0.825	\$ 6,717.38
Per CWT	\$ 16.79

Source Origins

With the exception of railcar barge traffic data provided by the Alaska Railroad there our research has not identified any publicly available data that reflects the true origin of containerized commodities moving via marine services from the Seattle / Tacoma area to Alaska. Given the nature of these commodities (general merchandise) it is reasonable to assume that they originate primarily within the Pacific Northwest, Oregon, and Northern California markets.

Freight charges for traffic originating in non local (Seattle/Tacoma) markets are priced by carriers using inland freight charges based on zip code definitions. Inland freight charges are in addition to the ocean freight charges shown earlier and can result in incremental charges ranging from \$200 USD per container to \$2500 USD per container. Specific origin-destination competitive rate assessments will be examined in the ensuing logistics evaluation for re-supply movements.

APPENDIX A

<u>Commodity</u>	<u>Origin</u>	<u>Via</u>	<u>Destination</u>	<u>Type</u>	<u>Size</u>	<u>Min Wt</u>	<u>Rate (CWT)</u>		<u>Total Freight</u>	
							<u>USD</u>	<u>CDN</u>	<u>USD</u>	<u>CDN</u>
Paper Articles, NOS	Tacoma WA	-	Anchorage AK	PC	20 FT	30,000	\$ 8.26	\$ 10.01	\$ 2,478	\$ 3,004
				IN	40 FT	40,000	\$ 8.26	\$ 10.01	\$ 3,304	\$ 4,005
				PC	40 FT	36,000	\$ 8.26	\$ 10.01	\$ 2,974	\$ 3,604
				IN	40B	40,000	\$ 8.26	\$ 10.01	\$ 3,304	\$ 4,005
				PC	40B	40,000	\$ 8.26	\$ 10.01	\$ 3,304	\$ 4,005
				PC	45B	45,000	\$ 8.26	\$ 10.01	\$ 3,717	\$ 4,505
Department Store Merchandise	Tacoma WA	-	Anchorage AK	PC	40B	18,000	\$ 25.82	\$ 31.30	\$ 4,648	\$ 5,633
Building Materials / Other Articles	Tacoma WA	-	Anchorage AK	PC	20 FT	36,000	\$ 13.72	\$ 16.63	\$ 4,939	\$ 5,987
				PC	20 FT	17,500	\$ 21.73	\$ 26.34	\$ 3,803	\$ 4,609
				FR	40 FT	41,000	\$ 13.72	\$ 16.63	\$ 5,625	\$ 6,818
				FR	40 FT	22,500	\$ 21.73	\$ 26.34	\$ 4,889	\$ 5,926
				IN	40	40,000	\$ 13.72	\$ 16.63	\$ 5,488	\$ 6,652
				IN	40	22,500	\$ 21.73	\$ 26.34	\$ 4,889	\$ 5,926
				PC	40	39,600	\$ 13.72	\$ 16.63	\$ 5,433	\$ 6,586
				PC	40	22,500	\$ 21.73	\$ 26.34	\$ 4,889	\$ 5,926
				IN	40B	40,000	\$ 13.72	\$ 16.63	\$ 5,488	\$ 6,652
				IN	40B	22,500	\$ 21.73	\$ 26.34	\$ 4,889	\$ 5,926
				PC	40B	44,000	\$ 13.72	\$ 16.63	\$ 6,037	\$ 7,317
				PC	40B	25,000	\$ 21.73	\$ 26.34	\$ 5,433	\$ 6,585
				PC	45B	46,000	\$ 13.72	\$ 16.63	\$ 6,311	\$ 7,650
				PC	45B	28,100	\$ 21.73	\$ 26.34	\$ 6,106	\$ 7,401
Horticultural Supplies / Other Articles	Portland, OR	Tacoma WA	Anchorage AK	PC	40B	38,000	\$ 11.16	\$ 13.53	\$ 4,241	\$ 5,140
	Woodland, WA	Tacoma WA	Anchorage AK	PC	40B	38,000	\$ 11.16	\$ 13.53	\$ 4,241	\$ 5,140
Nursery Stock and Other Articles	Tacoma WA	-	Anchorage AK	PC	20	-	\$ 2,989.00	\$ 3,623.03	\$ 2,989	\$ 3,623
Poultry, Frozen / Chicken Parts	Tacoma WA	-	Anchorage AK	RE	40	39,250	\$ 21.01	\$ 25.47	\$ 8,246	\$ 9,996
				RE	40B	42,000	\$ 21.01	\$ 25.47	\$ 8,824	\$ 10,696

<u>Commodity</u>	<u>Origin</u>	<u>Via</u>	<u>Destination</u>	<u>Type</u>	<u>Size</u>	<u>Min Wt</u>	<u>Rate (CWT)</u>		<u>Total Freight</u>	
							<u>USD</u>	<u>CDN</u>	<u>USD</u>	<u>CDN</u>
Groceries / Other Articles	Tacoma WA	-	Anchorage AK	PC	20	36,000	\$ 11.38	\$ 13.79	\$ 4,097	\$ 4,966
				IN	40	40,000	\$ 11.38	\$ 13.79	\$ 4,552	\$ 5,518
				PC	40	39,600	\$ 11.38	\$ 13.79	\$ 4,506	\$ 5,462
				IN	40B	40,000	\$ 11.38	\$ 13.79	\$ 4,552	\$ 5,518
				PC	40B	44,000	\$ 11.38	\$ 13.79	\$ 5,007	\$ 6,069
				PC	45B	46,000	\$ 11.38	\$ 13.79	\$ 5,235	\$ 6,345
Foodstuffs, Canned	Tacoma WA	-	Anchorage AK	PC	20	36,000	\$ 11.02	\$ 13.36	\$ 3,967	\$ 4,809
				IN	40	40,000	\$ 11.02	\$ 13.36	\$ 4,408	\$ 5,343
				PC	40	39,600	\$ 11.02	\$ 13.36	\$ 4,364	\$ 5,290
				IN	40B	40,000	\$ 11.02	\$ 13.36	\$ 4,408	\$ 5,343
				PC	40B	44,000	\$ 11.02	\$ 13.36	\$ 4,849	\$ 5,877
				PC	45B	46,000	\$ 11.02	\$ 13.36	\$ 5,069	\$ 6,144
Fertilizer, Feed & Other Articles	Tacoma WA	-	Anchorage AK	PC	20	36,000	\$ 11.12	\$ 13.48	\$ 4,003	\$ 4,852
				FR	40 FT	41,000	\$ 11.12	\$ 13.48	\$ 4,559	\$ 5,526
				IN	40	40,000	\$ 11.12	\$ 13.48	\$ 4,448	\$ 5,392
				PC	40	39,600	\$ 11.12	\$ 13.48	\$ 4,404	\$ 5,338
				IN	40B	40,000	\$ 11.12	\$ 13.48	\$ 4,448	\$ 5,392
				PC	40B	44,000	\$ 11.12	\$ 13.48	\$ 4,893	\$ 5,931
				PC	45B	46,000	\$ 11.12	\$ 13.48	\$ 5,115	\$ 6,200
FAK - Refrigerated, NOS	Tacoma WA	-	Anchorage AK	RE	40	42,250	\$ 18.65	\$ 22.61	\$ 7,880	\$ 9,551
				RE	40	33,000	\$ 20.55	\$ 24.91	\$ 6,782	\$ 8,220
				RE	40B	44,000	\$ 18.65	\$ 22.61	\$ 8,206	\$ 9,947
				RE	40B	36,000	\$ 20.55	\$ 24.91	\$ 7,398	\$ 8,967
Fak Mixed Shipments	Tacoma WA	-	Anchorage AK	PC	20	22,000	\$ 2,201.00	\$ 2,667.88	\$ 2,201	\$ 2,668
				PC	20	22,000	\$ 2,260.00	\$ 2,739.39	\$ 2,260	\$ 2,739
				PC	20	22,000	\$ 2,283.00	\$ 2,767.27	\$ 2,283	\$ 2,767
				PC	20	22,000	\$ 2,339.00	\$ 2,835.15	\$ 2,339	\$ 2,835
FAK All Kinds, Frozen	Tacoma WA	-	Anchorage AK	RE	40	42,250	\$ 18.42	\$ 22.33	\$ 7,782	\$ 9,433
				RE	40	33,000	\$ 20.33	\$ 24.64	\$ 6,709	\$ 8,132
				RE	40B	44,000	\$ 18.42	\$ 22.33	\$ 8,105	\$ 9,824
				RE	40B	36,000	\$ 20.33	\$ 24.64	\$ 7,319	\$ 8,871