Prince Rupert: Gateway to the Twin Cities and the Potential Value Added Intermodal Freight Service

Richard D. Stewart[1], Xiubin Wang and Adolph Ojard

The North American Pacific Rim Infrastructure: Capacity Issues

The expected doubling of world trade in US markets in the next 20 years will place demands on all transportation networks.[2] The Transpacific Stabilization Agreement (TSA) expects Asia-US cargo demand to continue growing in the foreseeable future; with traffic continuing at record levels, and new ship capacity continuing to be constrained by harbor and inland infrastructure limitations along the intermodal freight corridor. Many US West Coast ports are operating at or near capacity, and are experiencing significant delays and/or the inability to fully serve markets. A 2003 study found that of the 16 major US ports studied 75% will have capacity problems by 2010.[3]

Along with the pressuring shortage of capacity is the reliability of intermodal services from the West Coast to inland USA, including the Midwest region. A reliable network is essential in order to support the expanding international trade with Asian countries such as China. The Pacific Maritime Association (PMA) lockout in 2003 highlighted the vulnerability of the transportation network; any problems within the limited number of US ports that can handle the newer 10,000 to 12,000 twenty-foot equivalent unit (TEU) container ships would have serious ramifications on the economy of the Midwest.

The addition of new harbor(s)/capacity and new intermodal corridors would best serve the regional interest strategically, as carriers and shippers are seeking routes to move imports and exports to and from distribution centers that supply major markets. A stable and profitable intermodal transportation takes place in high-volume corridors.

New Asia-North America Container Port and Freight Corridor

The West Coast port congestion and the acquisition of British Columbia rail by CN Rail in 2004 set the stage for a unique opportunity: the creation of a new container port with excellent

intermodal connections to the center of Canada and the US Midwest. CN Maher terminals of Canada, CN Rail, and the Prince Rupert Port Authority have joined forces to create a state of the art container port that will launch in 2007. Three large container cranes capable of servicing super-post-panamax vessels of 12,500 TEU will be installed. Initial throughput will be 500,000 TEUs per year, with the potential expansion to at least 2,000,000 TEUS per year.[4] Maher has facilities in the Port of New York and New Jersey, where it has operated since 1946, and currently operates one of North America's largest marine terminals. The Government of Canada is backing the development and expansion of Prince Rupert as part of their "Pacific Gateway Strategy."[5]

Prince Rupert has a number of distinct advantages as a port of entry: a natural ice free deep draft harbour with landside room for expansion; the shortest ocean line-haul routes between Asia and North America with significant expansion potential; no US Harbor Maintenance Tax (HMT); and no port congestion for the lack of cargo for the immediate area[6].

The advantages of the infrastructure linking Prince Rupert to Canada and the US are clear. First, there is a high capacity rail line to the interior of Canada and US with minimal grade. Second, Canadian National, a Class 1 rail, provides an extensive network connection to the market in North America, through many heartland intermodal terminals in Winnipeg, Chicago, and Memphis. Third, CN Railroad's mainline that connects Prince Rupert to the Midwest markets is not operating at capacity. Fourth, this corridor has backhaul revenue potential to ship containerized agricultural and forest products from the heartland to Asia.

This paper analyzes two alternative routes serving the Twin Cities area of Minnesota with cargo coming from Asia through the Prince Rupert Port. The research team has defined the Twin Cities Market as all cargo origin-destination points within a distance of 250 miles of the Twin Cities. This distance represents a roundtrip dray that can be accomplished in one day. The Chicago Market would be a radius of 250 miles out from Chicago.

The first alternative is to carry Twin Cities intermodal cargo from

Prince Rupert directly to Chicago, bypassing the Twin Ports area of Duluth, MN, and Superior, WI. This route would include a 350 mile (7 hour one-way) drayage operation from Chicago to the Twin Cities. The second alternative proposed is for the Twin Cities cargo bound to and from Prince Rupert to stop in the Twin Ports. This route would include a 150 mile (3 hour) drayage operation to the Twin Cities. Chicago cargo to and from Prince Rupert would go either directly to Chicago in unit trains from Prince Rupert or, if the stopping time were compatible with system design, to continue from the Twin Ports as part of a multi-load train.

Twin Cities Region: Intermodal Capacity

The Twin Cities will see a continuous population growth in the foreseeable future, and will be a growing trade partner with countries in the Far East. The population of the Twin Cities seven county Metropolitan area is projected to grow to 3,005,000 by 2010, an increase of 13.7% from the 2,642,056 population in the 2000 Census.[7] In addition, there is a population base of approximately 4.3 million people within a 250 mile drayage distance from the Twin Ports, see Figure 1.

Twin Ports Intermodal Terminal Marketing Region

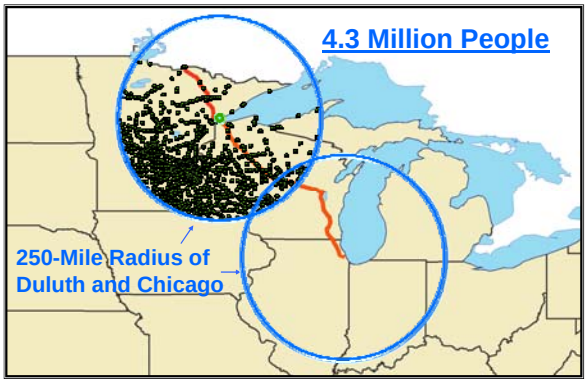

Figure 1: Population Base within 250 Miles of the Twin Ports[8]

The current two Twin Cities terminals have the potential to move 285,000 of the forecasted lifts leaving 175,000 lifts that need to move

through other routes. This is due to capacity issues facing the rail carriers that operate intermodal transportation in the Twin Cities. Currently, Burlington Northern Santa Fe (BNSF) Railroad has its Midway Hub Terminal in St. Paul (Twin Cities), serviced by rail from the ports of Tacoma and Seattle. Canadian Pacific's (CP) intermodal facility in Minneapolis is serviced by rail from the port of Vancouver, BC.

There is concern about the limited growth potential for the existing Twin Cities intermodal terminals. Although there have been several studies on developing additional freight terminals[9], no new freight terminals appear to have been concluded as feasible and put into construction. BNSF is considering expanding its intermodal capabilities with a facility on its rail line near the Midway terminal. Nevertheless, terminal expansion in the Twin Cities has historically been thwarted by zoning restrictions and land use conflicting with suburban sprawl.[10] Opening new intermodal corridors with freight terminals located within easy drayage distance to the Twin Cities would undoubtedly relieve pressure for expanding the Twin Cities intermodal terminal capacity.

With many class 1 rail road corridors and West Coast US ports approaching capacity, a regional increase in intermodal traffic provides opportunities for alternate routes. The Prince Rupert route has the potential to serve the Twin Cities region through two gateways: Chicago, Illinois, and the Twin Ports. The potential of providing this alternative route by CN to serve the Twin Cities market warrants this study.

Study Questions and Methodology

Opening of the Prince Rupert port and establishing new freight corridors from the West Coast to inland North America presents new opportunities of serving the numerous markets in the Midwest region of America, undoubtedly bringing the need for changes to infrastructure and operational plans of carriers.

- How much would be the potential savings from the new intermodal service through Prince Rupert for the trade with China?

What are feasible intermodal operational plans along this new freight corridor for serving the Twin Cities region?

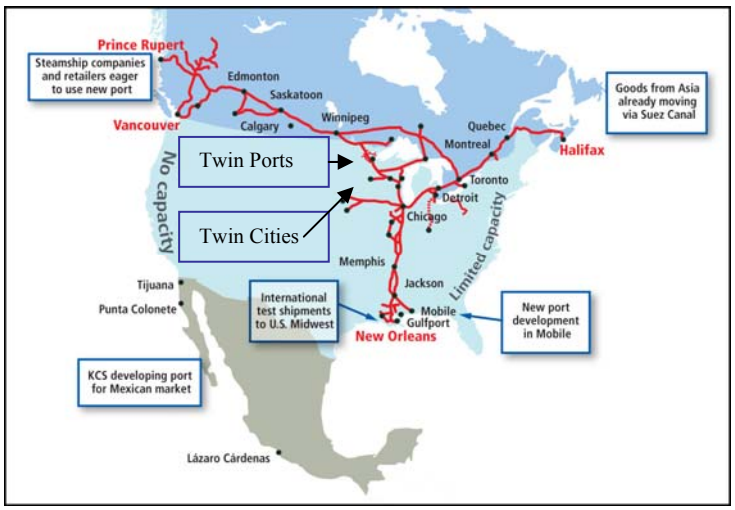

Figure 2: CN Rail Network with Principal Intermodal Terminals Named - Courtesy of CN Railroad

Intermodal traffic data is mostly from carriers such as BNSF and Canadian National Railroad (CN) as noted. Ocean travel times and trade forecasts are obtained from government sources and price estimates from industry sources. The methodology adopted is simply based on developing feasible operational plans for CN, which will solely operate on the new freight corridor. We adopt two perspectives: the first is a conservative one, in which the new route will take on the extra demand to the current volume that the current capacity will not be able to handle; and the second perspective is based on the simple logit model for stochastic route choice which assumes that the current corridors can have traffic shifting to the new intermodal corridor after reaching equilibrium. The latter also adopts a conservative approach regarding the total future traffic forecast.

Two Intermodal Alternatives to Serve the Twin Cities

The new CN service would be competing for Asian cargo moving through Burlington Northern Santa Fe (NSF), Canadian Pacific (CP), CN's Vancouver route and Union Pacific (UP)'s ports of entry with

intermodal service to the region. Two potential alternatives by CN would be competitive in the market.

Alternative I: A Prince Rupert - Chicago - Twin Cities
The CN line haul rail service from Prince Rupert would provide 10,000 foot intermodal trains to Chicago, carrying traffic destined to the Twin Cities and Chicago, and passing the Twin Ports. This corresponds to CN's initial network design that has the Twin Cities being served from CN's Moyer Intermodal Terminal in Chicago. Cargo would be moved by truck drayage to the Twin Cities or possibly transfer to the BNSF's shuttle train that leaves from Chicago to Midway Terminal in St. Paul.

To put the routes' physical differences in perspective, CN currently operates a route from Vancouver that must go through mountain passes that are higher and steeper than the Prince Rupert route. Trains on the Vancouver route require more locomotive power and a longer time. Once the intermodal train arrives in Chicago, routing to the Twin Cities would be no different than current intermodal service from Vancouver**.**

Advantages of a Prince Rupert-Chicago-Twin Cities service:
- Reduced transit time: The new route reduces the time from a west coast port of entry to the Chicago intermodal terminal and then to the Twin Cities. (Transit time reductions could be as significant as 143 hours over the longest route.) The reduction in time savings translates to a reduction in inventory costs.
- Elimination of Harbor Maintenance taxes: The United States imposes the Harbor Maintenance Tax (HMT), an Ad Valorum tax of .0125% of the value of the cargo. This tax would not be charged on cargo coming through Prince Rupert in Canada.

Derived benefits include improved asset utilization by rail and ocean carriers, as well as potentially lower freight rates due to the in-transit time savings.

Disadvantages of a Prince Rupert-Chicago-Twin Cities service:

- Drayage along the increasingly congested Twin Cities-Chicago I-90/94 corridor (between the two largest metropolitan areas in the upper Midwest region of the US): As freight and traffic increase there could be significant delays on this route, as well as increased surface road maintenance costs for Wisconsin, Illinois and Minnesota.
- Backtracking along route to return to the Twin Cities: The CN intermodal terminal in Chicago is south of the Twin Cities requiring backtracking north after the train has come south to Chicago costing time, money and energy. This route provides no savings in drayage over the current CN Vancouver to the Twin Cities route.
- Increase in Chicago congestion: The trains from Prince Rupert will add to the rail traffic in the United States' most congested rail center. There will also be an increase in truck traffic in Chicago highways when cargo is drayed by truck. In 2005, an estimated 13,980,000 TEUs were handled in the Chicago area. The expected growth by 2020 of just the Port of Los Angeles and Long Beach will add approximately 260 trains and 21,700 truck trips a day.[11]

Alternative II: Prince Rupert – Twin Ports - Twin Cities

An ideal route structure would capture the advantages of the Chicago option and eliminate the disadvantages. The CN main line from Vancouver and Prince Rupert to Chicago goes through the Twin Ports, where CN intermodal trains on the Vancouver to Chicago route currently stop for crew changes. After the intermodal train departs from the Pokegama Rail Yard in Superior, WI, the intermodal train travels another 16 hours to cover the approximately 490 miles to reach the Chicago intermodal terminal in Harvey, IL. The Chicago intermodal terminal is approximately 425 miles from the BNSF intermodal terminal (as a reference point) in St. Paul for a truck drayage time of approximately 7 to 8 hours. In contrast, the CN Pokegama Rail Yard in Superior, Wisconsin, is approximately 153 miles north of the BSNF intermodal yard in St. Paul for a truck drayage of approximately 3 hours. This alternative produces a savings of 4 to 5 hours each way.[12]

The 250 mile Twin Ports regional market not only serves consumption centers but has access to major production centers for paper, windows, wood products, dairy products, potatoes, grains products, packing, and poultry products. Demand for many of these value-added products is rapidly growing in Asian markets. This demand could provide back haul cargo in empty containers bound for Asia. Currently four out of ten containers return to Asia empty so there would be the potential for back haul cargo at reduced rates if there was minimal impact when serving the route. Major Midwest distribution centers in Tomah, WI, and the Twin Cities are within 250 miles of the Twin Ports by four lane highways. These distribution centers would have an alternative and less costly route than backtracking north from Chicago.

The Twin Ports are served by three major highway corridors, I-35, US-53 and US-2. The shorter rail distance to and from Prince Rupert via a Twin Ports route would allow for an increase in productivity from rail assets in delivering containers to the drayage area. Terminal space and other rail assets would be freed up for increased Chicago traffic. This supply chain results in a 450 mile shorter rail distance compared to alternative route 1 when not hauling regional cargo beyond the Twin Ports to Chicago.

The apparent potential for savings in time and energy using this alternate route raises the question: Can the Twin Ports serve as an intermodal terminal to service for the Twin Cities and surrounding region from Prince Rupert? This paper examines the potential Twin Ports alternative in terms of distance and time savings, terminal opportunities, and railway operational considerations.

A Significant Potential Savings in both Distance and Time

Markets	**Distance from Twin Ports**	**Distance from Chicago**
Duluth	5 Miles	490 Miles
Cloquet, MN	25 Miles	548 Miles
Hibbing, MN	76 Miles	574 Miles

Ashland, WI	71 Miles	460 Miles
Hayward, WI	76 Miles	441 Miles
Grand Rapids, MN	81 Miles	617 Miles
Ironwood, MI	106 Miles	422 Miles
St. Cloud, MN	144 Miles	492 Miles
St. Paul, MN	150 Miles	425 Miles
Bemidji, MN	150 Miles	652 Miles
International Falls, MN	163 Miles	649 Miles
Rhinelander, WI	188 Miles	357 Miles
Tomah, WI	234 Miles	259 Miles
Wausau WI	236 Miles	300 Miles

Table 1: Drayage Distances from Twin Ports or Chicago (2006 Mapquest.com Distances)

Significant savings in mileage can be found with markets in the region served by the Twin Ports (see Table 1). The shorter travel time allows a trucking firm to greatly increase productivity. In addition, the shorter drayage distances would be an advantage for hours of service restrictions on drivers allowing better utilization of driver resources. There would also accrue environmental benefits from less air pollution and fuel consumption with the shorter drayage distance. Environmental benefits, however, are not included in the calculated savings.

Potential Twin Ports Intermodal Terminal Locations

To establish an intermodal terminal, the proximity of a railroad's main line is vital but equally important in establishing an intermodal terminal is the existence of rail yards with suitable space for a terminal and easy access to other modes. There are four existing yards in the Twin Ports that have potential to be used as intermodal terminals with normal infrastructure improvement. A 2003 study rank ordered the four selected yards for intermodal terminal development.[13] Adding to its advantage is that each of these yards has adjacent property available for development and access to major highways including the I-35 system. Three of these yards are on or near the CN main line.

The following shows the existing rail yards in the Twin Ports with intermodal potential:

Rail Yard	Owner-Operator	State
1. Pokegama Yard	CN	WI
2. Steelton Yard	CN	MN
3. Proctor	CN	MN
4. 17th & 28th Street Yards	BNSF	WI

The Minnesota rail yards have the potential for substantial tax savings for new development through Job Z Zones, and the Wisconsin sites have available county land and tax incentives. A Foreign Trade Zone status can be obtained through the Duluth Seaway Port Authority for some of the potential intermodal sites, and the Twin Ports is a Customs port of entry.

Clearly there are challenges for the Twin Ports alternative. Currently there is no intermodal handling equipment at any of the potential terminals. There will be capital requirements for new container handling equipment and parking areas. Nevertheless, as investment in infrastructure will be returned over a long period, its equivalent yearly cost allocated to each container movement could be very small. Furthermore, addition of an intermodal terminal could also benefit other traffic, and help improve the network performance to achieve other savings as well.

Significant cost savings could accrue if a transloading and distribution park was developed where the international containers were reloaded to 53' trailers. Drayage capacity would be increased and international containers would be available for a speedy return to steamship companies. The transloading/distribution center could also load outbound international containers. A separate study is needed to assess and quantify the costs and benefits of a new intermodal terminal, as the potential additional cost due to the new terminal has not been calculated as part of this study. Cost of terminal operations have been calculated using existing intermodal terminal costs with an additional drayage added. Other operational considerations include

directional balance of both freight and container movements, which is not discussed in details in this paper.

Train Operations: Prince Rupert – Twin Ports – Chicago Route

Train operational plans are available and viable along the Prince Rupert – Twin Ports – Chicago route. The outbound traffic from Prince Rupert bound for Chicago and the Twin Cities area consists of two groups: that destined to the Twin Ports for a shorter drayage to the Twin Cities (called Twin Ports cargo) and that destined to Chicago (called Chicago cargo). On this potential intermodal freight corridor, the blocking plan would be as simple as having only two blocks and two distinct train plans. Plan I consists of running trains with only Twin Ports' cargo that would terminate in the Twin Ports, and trains with only Chicago cargo destined for Chicago. Plan II has two flexibilities: the first block switches out cars with containers destined for the Twin Ports region and attaches cars with cargo bound for Chicago, with the second block proceeding directly to Chicago without stopping, Depending on the traffic mix and volume, Plan II allows Chicago cargo to be on both trains destined to the Twin Ports and trains destined to Chicago.

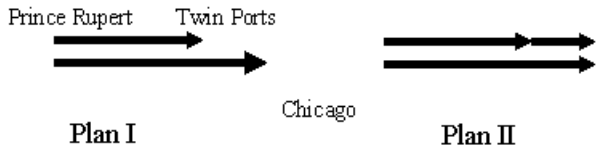

Figure 3 Train Plans: Prince Rupert – Twin Ports – Chicago

The two train plans are illustrated in Figure 3. Utilization of Plan II would impact Twin Ports cargo through shorter dwell times, more frequent deliveries, lower drayage costs but higher switching costs, while Chicago cargo might have a longer in-transit time than it otherwise would have, due to switching operation at the Twin Ports. Nevertheless, an opportunity exists to reduce dwell time for Chicago cargo if it is combined into trains with local traffic originating out of the Twin Ports and bound to Chicago.

Analysis of the alternative train plans depends on traffic data such as volume and mix, and the operational efficiency of the new CN rail intermodal terminal in the Twin Ports area. Therefore, we do not make an effort to quantify the trade-offs. One of the key questions would be how much traffic could be attracted to the Prince Rupert – Twin Ports –Twin Cities route? The 1995 MIRTS study concluded that "the current [1994] 250,000 container (unit) 'lifts; x 2 per year at the two existing Twin Cities terminals will increase to the year 2012 with a forecast of 530,000 lifts." The two Twin Cities terminals have the potential to move 285,000 of the forecast lifts leaving 175,000 lifts predicted for 2012 that need to move through other routes.[14] The analysis that the Twin Cities was short of intermodal terminal capacity was echoed again in the 2001 Twin Cities Transportation Audit.[15] Assuming that the projection in container service to the Twin Cities is true and that a gap of 175,000 lifts will occur, then the Prince Rupert – Twin Ports route would be poised to capture that market share. The impact of gaining market share from the Twin Cities is reflected in Table 2. This table does not reflect any container traffic that comes through Chicago or Kansas City that might be diverted to a Prince Rupert – Twin Ports route. Once the route is operational and proven, additional lifts would be expected from other producers and consumers in the region. Note that each container corresponds to two lifts.

PR-TP Market Share Forecasted Container Growth	Lifts	Annual Trains @ 400 containers per train	Trains per week
75%	131,250	328	6 trains per week
50%	87,500	219	4 trains per week
25%	43,750	109	2 trains per week

Table 2: Estimate of Traffic through Prince Rupert Port

Initially rail service may be limited to two or three times a week due to lower cargo volumes and the need for sufficient Twin Ports cargo to make up a train if Plan I was used. This would result in longer

dwell times in Prince Rupert with corresponding inventory interest, storage and handling costs. Note that this longer dwell time may be offset by its less congestion delays for cargo being drayed from Chicago.

Case Study: Time and Freight Rate Comparisons of Intermodal Container Freight from Hong Kong to the Twin Cities

In this case study, cargo comes from Hong Kong to the Twin Cities. All potential intermodal routes are compared including a theoretical one from Vancouver to the Twin Cities via the Twin Ports on CN's line.

Data and Methodology

In the attached sample freight rate comparison, the basis for distances and speeds to establish transit times are noted on the bottom. In most cases, the times given are based on goals established by carriers, so actual use will vary based on seasonality and other factors. Ocean distances were obtained from nautical routing charts and converted to times at an average speed of 24 knots. The research team made several conservative assumptions developing the model to reflect a worst case scenario: container value is set at $75,000 reflecting lower value cargo; rail service to the Twin Ports is only twice a week resulting in dwell times of 72 hours in Prince Rupert; drayage rates between the Twin Ports and the Twin Cities reflect no backhaul for the six hour trip at $50 per hour; and the terminal charges for the Twin Ports are the same rate as Chicago's.

This modal comparison reflects average freight rates, line haul times, dwell times, HMT, and in-transit inventory costs. This model does not compare external costs such as environmental impacts or fuel savings.

Time & Freight Comparison Model

Model based on a 40 foot ISO container with a cargo at a declared value of $750,000 US

$ 75,000 Declared Value 10.0% Cost of Capital

	Origin	Ocean Line Haul	Gateway	Rail Line Haul	Intermodal Terminal	Drayage Destination	Taxes	Intransit Inventory Cost	Total Hours and Total Cost
City	Hong Kong		Long Beach BNSF		Chicago	MSP			
Hours		288	96	103	37	7			531
Cost		$2,650		$1,000	$275	$1,485	$94	$455	$5,958
City	Hong Kong		Seattle BNSF		St. Paul	MSP			
Hours		265	24	113	24	1			427
Cost		$2,650		$1,550	$90	$175	$94	$366	$4,924
City	Hong Kong		Prince Rupert CN		Chicago	MSP			
Hours		226	24	107	24	7			388
Cost		$3,475			$225	$1,400		$332	$5,432
City	Hong Kong		Prince Rupert CN		Twin Ports	MSP			
Hours		226	72	90	24	3			415
Cost		$3,475			$225	$300		$355	$4,355
City	Hong Kong		Vancouver CN		Twin Ports	MSP			
Hours		247	24	92	24	3			390
Cost		$3,475			$225	$300		$334	$4,334

Total Time = (Ocean Line Haul Time) + (Gateway Dwell Time) + (Rail Line Haul Time) +(Intermodal Terminal Dwell Time) + (Drayage Time)
Total Rate = (Ocean Line Haul Rates + (Gateway Port Rates) + (Rail Line Haul rates) + (Intermodal Terminal Dwell Rates) + (Drayage Rates) + (All Taxes)[1] + (Intransit Inventory Cost)[2] Approximate Freight costs provided by 3PL Company March 2006 and may not reflect all costs..

Note: Port and Terminal rates should include all fees, lift charges and duties.

[1] Note: All imports through US Ports will pay a Harbor Maintenance Tax of 0.125% of the declared value of the good I.R.C. § 4461 . T HMT shall be paid by the "importer".
[2] Intransit Interest Inventory Cost = Declared Value of the goods x the Cost of Capital x the hours in transit divided by days in a year (365) * hours in a day (24). The cost of capital is assumed to be 10%. ($500,000 x 10%) x (total travel time in hours/
[3] Ocean Line Haul Speed = 24 knots per hour. Ocean line Haul distances obtained from - Somerville, Boyle T. (1950). Ocean Passage
[4] Rail Line Haul times obtained from railroad company websites: www.up.com; www.cn.ca/customer_centre/shipping_tools/en_index.s www8.cpr.ca/cms/English/Customers/New+Customers/What+We+Ship/Intermodal/default.htm; http://www.bnsf.com/bnsf.was5/siiswe

No ocean line volume freight rate exists for containers on the route from Hong Kong to Prince Rupert so we elected to use the 2nd quarter 2006 combined ocean/rail rate of $3,745, quoted for the route from Hong Kong to Vancouver. The competitive overall freight rates for the route from Hong Kong to the Twin Cities is estimated to be

$5,958 Via HK LB CHI TC on BNSF

$4,924 via HK-	SEA-	TC		on BNSF
$5,439 via HK – VC-		CHI-	TC	on CN
$5,432 via HK-	PR-	CHI-	TC	on CN
$4,334 via HK –	VC-	TP-	TC	on CN
$4,355 via HK-	PR-	Twin Ports-TC		on CN

The Vancouver-Twin Ports-Twin Cities route has the lowest freight price because of an assumed longer dwell time at Prince Rupert. If the Twin Ports terminal becomes a transload/distribution center moving international cargo to and from 53' trailers then the dwell time in Prince Rupert may be reduced to 24 hour making that route the lowest estimated price.

Logit Estimate of Traffic Volume along the Prince Rupert – Twin Ports – Twin Cities Route

We apply Logit model to predict the aggregate traffic volume that would be shifted to the Prince Rupert-Twin Ports route when the market reaches its equilibrium. To be conservative, we assume hypothetically that the new Hong Kong - Prince Rupert-Twin Ports route and the existing route Hong Kong - Tacoma (or Seattle) – Twin Cities as well as Hong Kong - Vancouver – Twin Ports route are equally competitive. In this hypothetical case, we are able to obtain a conservative estimate of the potential traffic volume. In addition, this hypothetical case does not require calibration of the sensitivity parameter θ. In this case, we may roughly say that the new Prince Rupert route has one third of the total traffic.

The estimate is calculated using 2001 data from Table 3.

Year	BNSF: Annual Lifts	CPRS Annual Lifts
1997	195,000	85,000
1999	180,000	71,200
2000	163,842	83,440
2001	165,175	74,828

Table 3: Twin Cities Intermodal Terminals' Annual Lifts (Data from CP, BNSF annual Intermodal lift reports and interviews.

The Prince Rupert – Twin Ports – Twin Cities route will serve as an alternative route to compete with the CP and BNSF intermodal routes. The estimated market share on the Prince Rupert – Twin Ports – Twin Cities route could be at least one third of the total volume, as the Prince Rupert route is more competitive than either of the other two alternatives. Therefore, the conservative estimate is (165,175+74828)/3=80,001. Considering that shifts from other routes serving the Twin Cities and other markets are possible, this estimate becomes even more conservative. In this scenario, our rough estimates would be about 5-6 trains each week via Prince Rupert destined to the Twin Cities through the Twin Ports, further reducing the dwell time at Prince Rupert. If potential growth is considered, a reasonable market share of the Prince Rupert route would amount to a significantly larger volume to the Twin Cities.

This estimate is conservative in several senses. First, it does not consider the opportunity that this new route may attract traffic from other routes that serve other markets than the Twin Cities. Second, traffic could also be shifted from other routes that currently serve the Twin Cities, such as routes through Kansas City or Long Beach. Third, it has not considered backhaul export opportunities that may further lower costs.

Conclusions

As the Asian trade grows, the demand to have that cargo reach the Heartland will increase. We studied two alternative plans to serve the growing Twin Cities market based on a developing rail freight corridor operated by CN. We find that there are significant savings in terms of time and freight charges when going through the port of Prince Rupert. The use of this port in serving the Asian market would result in increased asset utilization for the ocean line haul, truck and rail segments. The analysis of using the Prince Rupert gateway corridor indicates compelling advantages over competing alternatives currently available in the market. The Twin Ports, with its history as a transportation hub, is in a unique position to capitalize on Prince Rupert's development as a container port.

Freight rates for carrying containers from Asia to the US West Coast are expected to increase by 7% next year, according to the Transpacific Stabilization Agreement (TSA) carrier discussion group. There have also been predictions of a 25% hike in both inland rail and trucking transport rates, and an 11% increase for basic empty container repositioning and non-terminal container handling fees. The rate hikes are due in part to increasing demand, limited port capacity, and rising fuel and operational costs. The authors feel that rate increases will play a role in driving freight onto the studied routes.

The opening of a new container port with access to the Asia market from the US and Canadian heartland is a rare event and this opportunity needs to be explored to see where the best options are for shippers, carriers and the citizens of Canada and the US.

---

[1] Dr. Stewart is a professor of Transportation and Logistics, Department of Business and Economics, University of Wisconsin – Superior. Mr. Ojard is the Director of Duluth Seaway Port Authority, MN. Dr. Wang is an assistant professor of Transportation and Logistics, Department of Business and Economics, University of Wisconsin – Superior.

[2] US Department of Transportation, Freight Analysis Framework, National Summary: thttp://ops.fhwa.dot.gov/freight/freight_news/FAF/talkingfreight_faf.htm

[3] Trade and Transportation: A Study of North American Port and Intermodal Systems, National Chamber Foundation and US Chamber of Commerce, March 2003.

[4] Railway Age, April 2005.

[5] "Government of Canada Announces Pacific Gateway Strategy", Government Canada News Release, GC No 013/05, October 21, 2005.

[6] Vickerman, Zachar, Miller, Intermodal/Container Terminal Planning and Design, AAPA, 1990, The potential productivity of a rail-ship direct interchange would minimize rail car movement and maximize loading and unloading capability. P. 11.

[7] "Twin Cities Population Forecast Fact Sheet", Metropolitan Council, 2004

[8] US Census Data for 2000

[9] Railway Age, June 1996.

[10] "Need for Intermodal Railroad Terminal Facilities in the Twin Cities Metropolitan Area." Minnesota Intermodal Railroad Terminal Study" (MIRTS). National Transportation Library, February, 1995.

[11] Rawling, Gerald, "Intermodal Volumes III: Serial Measuring", Working Paper 06-01, Chicago Area Transportation Study, April 2006

[12] All Distances are based on 2006 Mapquest.com routing using highway miles.

[13] Richard Stewart, Robert Eger III, Libby Ogard and Frank Harder, Twin Ports Intermodal Freight Terminal Study, Midwest Regional Transportation Research Center, National Transportation Library Catalog Number DFDA 20.701, Washington, DC. July 2003.

[14] "Need for Intermodal Railroad Terminal Facilities in the Twin Cities Metropolitan Area." Minnesota Intermodal Railroad Terminal Study" (MIRTS). National Transportation Library, February, 1995

[15] 2001, Twin Cities Transportation Audit, Metropolitan Council, http://www.metrocouncil.org/planning/transportation/Audit2001/Audit2001.htm