The Corporation of Delta
COUNCIL REPORT
Regular Meeting

F.02

To: **Mayor and Council**

From: **Human Resources and Corporate Planning Department**

Date: **September 4, 2014**

Inland Port Study

The following report has been reviewed and endorsed by the Chief Administrative Officer.

- **RECOMMENDATION:**

THAT the Inland Port Study be provided to members of the Inland Port Stakeholder Group and:

i. The Honourable Todd Stone, Minister of Transportation & Infrastructure

ii. The Honourable Shirley Bond, Minister of Jobs, Tourism & Skills Training

iii. The Honourable Teresa Wat, Minister of International Trade

iv. The Honourable Norm Letnick, Minister of Agriculture

v. The Honourable Kerry-Lynne D. Findlay, PC, QC, MP Delta-Richmond East, and Mark Strahl, MP Chilliwack-Fraser Canyon

vi. Scott Hamilton, Member of the Legislative Assembly, Delta-North, and Jackie Tegart, Member of the Legislative Assembly, Fraser-Nicola

vii. Robin Silvester, Chief Executive Officer, Port Metro Vancouver

viii. Robert Landucci, CEO, Ashcroft Terminal

- **PURPOSE:**

The purpose of this report is to bring forward the *Inland Intermodal Cargo Facility Study* prepared by Cargo Velocity, and to provide a summary of the findings of the report for Council's information.

- **BACKGROUND:**

Delta Council has been supportive of the concept of inland terminals since 2008 when Council endorsed a motion to support the continued development of Ashcroft Terminal. Subsequently, in early 2013, Mayor Jackson spearheaded two multi-stakeholder meetings to look at the potential benefits of inland ports for the lower mainland region - specifically, the potential role Ashcroft Terminal could play in relieving truck traffic congestion and land development pressures from Deltaport and the proposed Roberts Bank Terminal 2.

During the 2013 UBCM annual convention, Mayor Jackson met with several provincial Ministers who expressed interest in exploring this issue further. Some studies on inland ports have already been done; however, they provide a more general assessment of the benefits of inland terminals for British Columbia and Canada as a whole. It became apparent, therefore, that a more focused assessment would be required in order to present the benefits of an inland port, such as Ashcroft Terminal, for the Delta and Metro Vancouver area.

Consequently, staff undertook a review of consultants with expertise in the field of cargo logistics and, at the March 10, 2014 Regular Meeting, Council approved a contract with Cargo Velocity Inc. to undertake a study of the potential benefits of an inland port for Delta and the Metro Vancouver region as a whole.

- **DISCUSSION:**

A copy of the final report entitled *Intermodal Cargo Facility Study* is provided as Attachment 'A'. The report was prepared by a consulting team of experts from Cargo Velocity Inc., CH2M Hill, and InterVistas and involved extensive consultation with business and industry representatives, including Port Metro Vancouver, Ashcroft Terminal, natural resource companies and transportation stakeholders. The key assumptions of the study are outlined below.

Single Export Commodity:
The study examines the impact of an inland terminal on truck volumes for a single export commodity – lumber and wood pulp – which, combined, are one of the largest containerized commodities exported through Port Metro Vancouver (accounting for **47%** of all containerized exports in 2013). The manufacturing base for lumber and wood pulp is in the same region as the proposed inland terminal.

Location:
The study assumes that the inland port would be located in the BC interior, close to Kamloops or Ashcroft, in order to fulfill the following success factors identified in the BC Government's report on inland ports[1]:

- Adequate catchment area – lumber and wood pulp arrive at the facility from sites in BC and Alberta.
- Availability of suitable land – a large area of land is needed for industrial development. For context, Ashcroft Terminal is 130 hectares in size, Deltaport Third Berth 20 hectares, and Terminal 2 is proposed to be 115 hectares.
- Reliable and competitive rail service – both CN and CP have main lines running through the area. **Ashcroft is the last location westbound and the first location eastbound at which mainline traffic can stop to or from Metro Vancouver.**
- Good access to highway network – Highways 1 and 5 offer fast, efficient access to Vancouver, the BC interior and Alberta.

[1] BC Ministry of Transportation, *Inland Container Terminal Analysis* (2006)

Although Ashcroft Terminal is within the study area, the study does not preclude the siting of an inland port or ports at other locations that fulfill the optimal site requirements.

Data and Modelling:
The study uses Port Metro Vancouver data for current and predicted export volumes to 2031 (when T2 is expected to be fully operational) with supporting data from lumber and pulp mills.

By 2031, lumber shipments through Port Metro Vancouver are expected to increase from the current 144,000 containers to 292,000, and wood pulp shipments are expected to increase from 93,000 to 133,000 containers in the same period, for a total volume of 425,000 containers annually of wood products. The study assumes that the majority of this cargo would by-pass the inland port for continued transloading in the Lower Mainland since the inland terminal would only take a small percentage of the projected growth to 2031. This is important to note when considering potential impacts on jobs and employment.

The most recent version of the Gateway Sub-Area Model EMME regional transportation model was used to conduct the truck traffic analysis. Four different scenarios were modelled - the most conservative scenario being **1 train per week being loaded at an inland terminal** (217,000 truck trips removed annually) and the most optimistic scenario being **4 trains per week** (868,000 fewer truck trips annually to 2031).

Study Limitations:
Given the time and budgetary constraints, and the sheer complexity of goods movement and transportation logistics, this study was not intended to be an exhaustive assessment of the economic feasibility of inland ports. The study does not assume that there is a stand-alone business case for an inland terminal. While the business case is an important consideration, it is not the only requirement to justify an inland port.

STUDY RESULTS

The report clearly demonstrates that an inland terminal in the interior region of British Columbia, such as Ashcroft, could achieve the following traffic, economic, social and environmental benefits:

1. **Fewer Truck Trips:**

   Based on the most conservative scenario, where 1 truck out of 28 is replaced by rail, by 2031 there would be **360 fewer one-way truck trips per day** (or 217,000 trips annually) to/from Deltaport and T2. This represents a 5% decrease in truck traffic. This equates to **12 million** fewer truck kilometres driven annually.

   Based on a more optimistic scenario where 1 truck out of 9 is replaced by rail, by 2031 there would be **1,080 fewer one-way truck trips per day** (650,000 fewer trips annually) and **36 million** fewer truck kilometres driven.

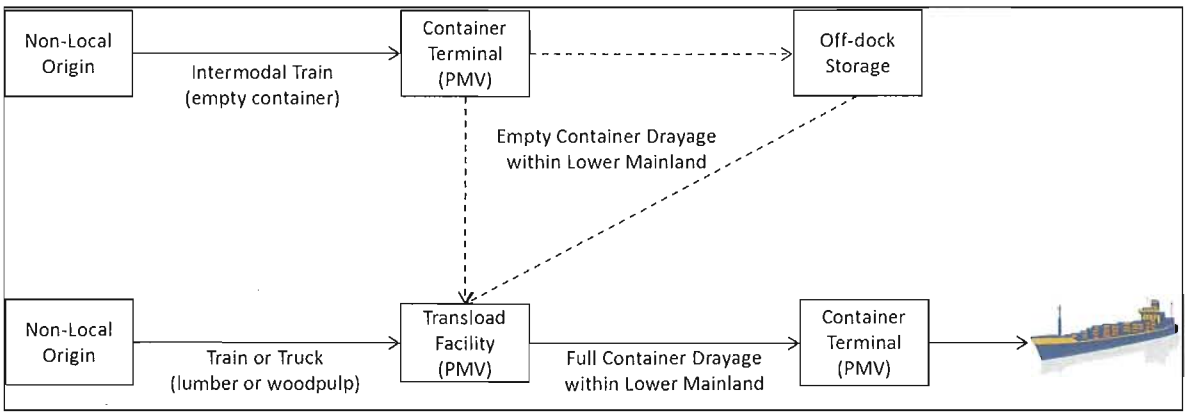
Based on 2011 data from the American Transportation Research Institute, the average cost to run a truck is $1.70 per mile. The costs savings for 36 million km (22 million miles) is considerable - **$37.4 million**. Recognizing that this transportation will still have to occur by rail and there are costs associated with this, the savings are nevertheless still substantial.

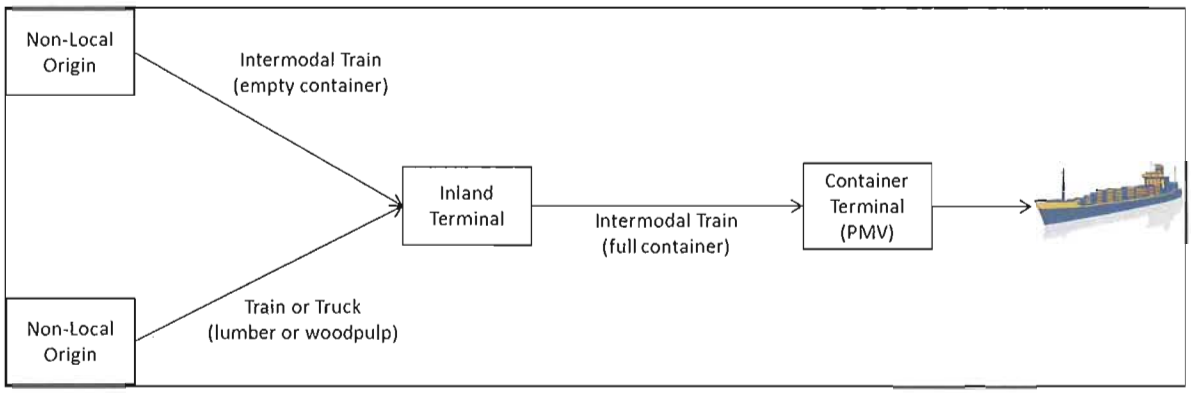
2. **Fewer Truck Transfers and Movement of Empty Containers:**

The existing trade imbalance with Asia leads to a logistics situation in the Lower Mainland **where 60% of all westbound rail containers are empty.** Since container terminals have limited storage space, many of these empty containers are delivered to Deltaport and subsequently trucked to an off-dock location. The movement of containers throughout the lower mainland is such that **each exported container requires 2-3 container truck transfers**:

- Empty containers move to an off-dock location (50% of such facilities are located in Tilbury and Annacis Island)
- Possible repositioning move from the off-dock location to a transloading facility.
- Full container move from transloading facility to a container terminal.

An inland terminal would ship full containers via rail to Port Metro Vancouver, thereby eliminating those 2-3 container transfers. The effective throughput of a container terminal in the land-constrained port area of Vancouver could be increased by storing "depot" empty containers inland from the Port. Depot empties are used for loading locally, and could be returned to an off-dock empty depot instead of the Port terminal. The impact of having an inland port by 2031 would be the **avoidance of 140,000 truck trips annually within the Lower Mainland.** The following diagrams illustrate this effect:





3. **Faster turnaround of rail equipment:**

The current shortage of railcars would be alleviated by turning equipment around in the Kamloops/Ashcroft area rather than at Vancouver container terminals. It is estimated that the railcar turnaround could be improved by one to two weeks per trip.

4. **Improved service to shippers at a potentially reduced cost:**

Shippers would benefit from being able to drop off export cargo closer to their location, and terminal operators would benefit from the ability to schedule train loads of this export cargo for arrival at the Port during non-peak terminal hours. The seaport operator could also plan for the cargo load list associated with the train.

5. **Reduced pressure to develop agricultural land near the port:**

Delta has some of the finest farmland in Canada and 42% of Delta is in the ALR. Prime agricultural land in Delta could be conserved for farming purposes, while the unproductive land in the Kamloops/Ashcroft area would be ideal for industrial purposes. Agricultural land is a finite resource and farmland conservation is an important strategic goal for Delta.

6. **Economic investment and job creation in the Ashcroft/Kamloops region:**

The economic benefits of port activity are spread more equitably through the Lower Mainland and the BC interior – the development of the inland port would attract investment to the area and generate much-needed jobs and economic development opportunities for the region.

7. **Fuel Savings and Reduced carbon emissions:**

The reduction in truck trips and mileage driven means lower fuel consumption and reduced carbon emissions of approximately **10,000 tonnes** a year based on the conservative scenario and almost **38,000 tonnes** a year based on the optimistic scenario. **Associated fuel savings would be 3.5 million litres and 14 million litres of diesel annually.**

8. **Employment:**

The report shows that there will be significant cost savings in terms of trucking employment with the development of an inland terminal. For scenario 1, there will be a savings of 147 person years of employment, and with scenario 4, 611 person years saved. This translates to a **savings for the trucking companies of $8 million and $34 million per year respectively by 2031**. It is important to note that this does not represent lost jobs since the inland port is only taking a small percentage of the forecasted container growth – no jobs will be lost, but there will be less need for more truck drivers to handle the additional containers.

The table below compares the relative types of costs of current operations with those using an inland terminal:

Type of Cost incurred, Current Model	**Type of Cost incurred, Inland Terminal**
Rail Transportation of empty container from origin (e.g. Toronto/Montreal) to Port of Vancouver.	Rail Transportation of empty container from origin (e.g. Toronto/Montreal) to Kamloops/Ashcroft: **Reduction of 400 km**
Rail/truck Transportation of lumber/woodpulp from manufacturing site to transloading facility in Lower Mainland.	Truck/rail Transportation of lumber/woodpulp from manufacturing site to Kamloops: **Reduction of 350 km**
Truck Empty container move from container terminal.	N/A
Truck Empty container repositioning move (if applicable)	N/A
Transloading costs in Lower Mainland.	Transloading costs at Ashcroft.
Truck Full container move to container terminal	Rail Full container move to container terminal.
Demurrage/empty container storage charges in Lower Mainland and at container terminals.	Demurrage/empty container storage charges at Ashcroft.

Global Context:

The benefits of inland ports are increasingly being recognized around the world. Delta is facing similar pressures to those of other port communities with respect to the impact of rapidly growing container volumes and related port infrastructure. The study provides some examples of inland ports that service many US ports for export transloading, including Portland, Oregon, Long Beach, California, the Port of Charleston in South Carolina and the Port of Virginia. **Many European countries are using legislative or contractual tools to oblige container terminals to transport more by barges and trains and less by truck.** With the massive Maasvlakte 2

expansion, the Port of Rotterdam will double its container capacity to 34 million TEUs. Currently 58% of cargo leaves the port by truck. By 2033, this must be reduced to 35%. This will be achieved by contractual obligations requiring the use of inland ports to manage the cargo.

Inland Port Stakeholder Meeting:
The preliminary findings of the study were presented to the Inland Port Stakeholder Group on June 19, 2014. The report was well received and critical peer review feedback supported the assumptions and general approach of the study. The meeting included presentations by Dr. David Fung, Director of Centreport Canada (the inland port in Winnipeg) and Mr. Johannes Vervloed, Consul General of the Netherlands. Both were strong advocates for inland ports and were very supportive of the development of an inland port in BC. Copies of their presentations are included as Attachments B and C.

Last week, Ashcroft Terminal provided the following update:

"There are a plethora of meetings going on with decision makers across a multitude of industries looking at how Ashcroft Terminal is a strategic inland solution. Without a doubt Mayor Jackson and Delta council's initiative to push forth and highlight Ashcroft Terminal as a cost effective, sustainable and efficient logistical solution throughout the gateway, has led to the increased attention, and continues to lead to greater awareness throughout industry."

Next Steps:
As previously noted, Delta is proposing to meet with the same four provincial Ministers as at last year's UBCM to provide copies of the report and to provide an update on the issue. It is also recommended that the report be circulated to the Federal Minister of Transport as well as members of the Inland Port Stakeholder Group, MPs Kerry-Lynne Findlay and Mark Strahl, MLAs Scott Hamilton, Delta-North and Jackie Tegart, Fraser-Nicola, Port Metro Vancouver and Ashcroft Terminal.

The limitations of the study have been discussed earlier in this report. Subject to funding availability, there may be an opportunity to undertake a second phase of the report which looks more closely at the benefits of inland ports to user groups and the economic drivers that support inland port use. The use of regulatory tools is also an issue to consider since many of the European inland ports rely on legislated requirements for goods movement rather than a simple economic justification.

It should also be noted that Metro Vancouver is in the process of preparing a terms of reference for an inlands port study. The study is part of an ongoing effort to support "broad-based understanding of goods movement in relation to land use and transportation decisions, and impacts on the regional economy, environment, and livability".

Implications:
Financial Implications – the study cost $45,000 US and was funded from within existing engineering traffic study budgets.

- **CONCLUSION:**

The inland port study clearly demonstrates that there are significant traffic, economic, social and environmental benefits of an inland terminal. The study is an important first step; however, additional work is required to better understand the impacts on all parties (shippers, receivers, railways, shipping lines, trucking companies etc.) including quantitative analysis of improved efficiencies of the inland port model. Delta provided funding for this first step. Collaboration and funding from other levels of Government is required to take the concept to the next level.

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Sean McGill
Director of Human Resources and Corporate Planning

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- **ATTACHMENTS:**

A. Inland Intermodal Cargo Facility Study
B. Perspectives from Winnipeg Inland Port
C. Inland Ports in the Netherlands



Inland Intermodal Cargo Facility Study
for the Corporation of Delta

Draft 1.6
August 15, 2014

Audience: Public review, with prior review by Corp. of Delta.

Summary: Provides a review of the possible traffic and community impacts of one or more inland intermodal terminals considered for the Ashcroft/Kamloops area of B.C., Canada. Impacts are considered in the Lower Mainland, BC, as well as in the facility region.

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1 EXECUTIVE SUMMARY

The Corporation of Delta commissioned a study into the potential impacts and benefits of an inland intermodal cargo facility (inland port) for the community of Delta, the Metro Vancouver region, and the inland port host community.

In many countries and regions of North America, inland ports have been developed to improve cargo logistics as well as mitigate near-port congestion. Depending on cargo flow in a region, these terminals can transfer many waterfront activities inland and thus reduce some of the undesirable impacts on the local community. Examples of logistics activities that can move inland include storage of a portion of surplus empty containers, "Transload" (unload and re-load) of cargo between box sizes, accepting export cargo for shipment at a location remote from the regional port, and delivery of import cargo inland from that port. This report assumes that an inland port within the Kamloops/Ashcroft area of B.C. will focus on all but the last activity[i].

INLAND PORT BENEFITS

The report shows that an inland terminal in the interior region of British Columbia, such as Ashcroft, could achieve traffic, economic, social, and environmental benefits.

1. Traffic Benefits

Section 3.4 and Chapters 4 and 5 focus on cargo flow, modelling assumptions, and traffic impacts to help determine the traffic benefits of an inland port like the Kamloops/Ashcroft area.

a. Fewer Truck Trips

- Based on the most **conservative scenario**, where 1 truck out of 28 is replaced by rail, by 2031 there would be **360 fewer one-way truck trips per day** to/from Deltaport and T2. This represents a 5% decrease in truck traffic.

- **217,000 fewer truck trips annually** in the Lower Mainland – the inland port would ship full containers by rail to Deltaport thereby eliminating 2-3 container movements by truck between the container terminals and various container handling facilities in the Lower Mainland.

- **12 million fewer truck kilometres** driven annually.

Based on a more **moderate scenario**, where 1 truck out of 9 is replaced by rail, by 2031 there would be:

- **1,080 fewer one-way truck trips per day** to/from Deltaport and T2.

- **650,000 fewer truck trips annually** in the Lower Mainland.

- **36 million fewer truck kilometres** driven annually.

These figures translate into reduced traffic congestion and the more efficient movement of cargo. The cost benefits of reduced truck transfers are provided in Table 22.

The proposed inland container terminal will have the potential to significantly reduce truck trips from the region's roadway network. This will provide benefits to other roadway users and neighbouring communities. The regional transportation EMME model was used to assess the potential impacts of removing 217,000 annual truck trips from the Lower Mainland roadway network. A total of twelve million truck kilometres travelled will be removed from the region's roadways which will provide congestion benefits to other road users. To put these numbers into perspective, one out of every 28 trucks forecast to be travelling to and from Deltaport in 2031 will be eliminated. Also, considering that truck trips region-wide are forecast to grow by 2.2% annually to 2031, this reduction in truck trips is equivalent to off-setting growth in the trucking sector by four months. Additional scenarios described in this report consider the potential to double, triple and quadruple the throughput of containers at the inland container terminal.

The study analysis indicates that the related benefits exceed that of the base case.

b. Fewer Empty Containers

Reduction of empty containers at container terminals – the effective throughput of a container terminal in the land-constrained port area of Vancouver could be increased by storing "depot" empty containers inland from the Port. Depot empties are used for loading locally, and could be returned to an off-dock empty depot instead of the Port terminal. Empty containers staged for export must still be stored at the terminal.

c. Faster Turnaround of Rail Equipment

The current shortage of railcars would be alleviated by turning equipment around in the Kamloops/Ashcroft area rather than at Vancouver container terminals. It is estimated that the railcar turnaround could be improved by one to two weeks per trip.

d. Improved Service to Shippers at a Potentially Reduced Cost

Shippers would benefit from being able to drop off export cargo closer to their location, and terminal operators would benefit from the ability to schedule train loads of this export cargo for arrival at the Port during non-peak terminal hours. The seaport operator could also plan for the cargo load list associated with the train.

2. Economic, Social, and Environmental Benefits

a. Reduced Pressure to Develop agricultural Land near the Port

Prime agricultural land in Delta could be conserved for farming purposes, while the unproductive, arid land in the Kamloops/Ashcroft area would be ideal for industrial purposes. Farmland conservation is an important strategic goal for Delta. The agricultural industry is a strong contributor to provincial GDP and provides fresh produce. High quality farmland is a finite resource of which a notable percentage is located in the Lower Mainland.

b. Economic Investment and Job Creation in the Ashcroft/Kamloops Region

The economic benefits of port activity are spread more equitably through the Lower Mainland and the BC interior – the development of the inland port would attract investment to the area and generate much-needed jobs and economic development opportunities for the region.

c. Reduced Carbon Emissions

The reduction in truck trips and mileage driven means lower fuel consumption and reduced carbon emissions of approximately **10,000 tonnes a year** with the conservative scenario.

The primary environmental benefit is from a reduction in greenhouse gas emissions. Secondary benefits include reduced vehicle idling from less traffic congestion and lower air pollution. The fewer truck kilometres driven in the BC Interior and the elimination of truck trips in the Lower Mainland results in significantly less diesel fuel consumed and, therefore, a sizable reduction in carbon emissions. If the inland port handles 56,000 containers in 2031 (i.e. Scenario 1), then carbon dioxide equivalent (CO_2e) emissions are reduced by 9,471 tonnes per year. This represents 169 kilograms of CO_2e saved per container processed through an inland terminal. For comparison, the average Canadian produces 20 tonnes of carbon emissions (i.e. from vehicle commuting, air travel, household heating, electricity usage, etc.) annually. So, the reduction is equivalent to the yearly carbon emissions of about 500 Canadians.

[1] Facility Overview

The proposed inland facility would have the following capabilities:

a) "Hook and haul" service to mainline rail operators. This means that the facility does not delay the locomotives, and therefore must be able to exchange car strings from full-length intermodal trains in less than one hour. The facility's design, equipment, and staffing must enable this level of service.
b) Supporting design - the facility must be secured with fencing and have on-site security enabling storage of international cargo. The facility must have a cargo transfer warehouse that allows transloading from trucks, trains, and shipping containers.
c) Inventory - the facility must effectively manage a range of empty containers and operate in close coordination with the customers, terminals, and the rest of the supply chain. This implies investment in technology, management staff, and nearly 24-7 operations.

Facility Operation

A typical day at the inland port would involve:

a) Receiving a west-bound train and cutting a section of cars full of empty containers.
b) Using a local switch engine to connect a prepared string of loaded containers to the same train, and assisting with departing the train.
c) Unloading the empty containers from the disconnected car string, and storing them in an empty yard.
d) Receiving a string of loaded boxcars or other train car with "break-bulk" (non-containerized) forest products.
e) Transloading breakbulk forest products to appropriate empty shipping containers by line and type.
f) Loading full containers to disconnected waiting intermodal cars.

2 INTRODUCTION TO THE STUDY

2.1 Project Scope

In March 2014, the Corporation of Delta (Delta) approved funding for an inland intermodal cargo facility impact assessment[1] to be undertaken by independent consultants, Cargo Velocity and their subconsultants Intervistas and CH2M Hill. This assessment examines, at a high level, the benefits of using inland container terminals to:

- Relieve traffic congestion in host communities
- Limit empty container movements (by both road and rail)
- Match labor/land/zoning opportunities with need
- Create benefits in the community that is hosting the inland terminal
- Move some of the traffic pressure away from host port communities

The report includes commentary relating to the benefits, drivers and changing popularity of inland container terminals and, at a more specific level, looks at how Ashcroft Terminals and other inland container terminals would help to (i) relieve pressure on the road network in Delta and Metro Vancouver, and (ii) reduce the demand to industrialize agricultural land in the vicinity of the Port. The report examines at a high level the economic benefits related to this and extrapolates the environmental and social benefits that would result from reduced traffic congestion and preservation of farmland. The work was limited in scope, and excluded analysis of the expected utilization of such a facility.

Appendix B provides a summary of interviews and document references used for this study.

2.2 Background

A common definition of an inland port is: "...a physical site located away from traditional land, air and coastal borders with the vision to facilitate and process international trade through strategic investment in multi-modal transportation assets and by promoting value-added services as goods move through the supply chain" (Center for Transportation Research, University of Texas). A more general term for an inland port is an inland intermodal cargo facility. In this report, the terms are used interchangeably.

An inland port can speed the flow of cargo between ships and major land transportation networks, creating a more central distribution point. Inland ports can improve the movement of imports and exports, moving the time-consuming sorting and processing of containers inland, away from congested seaports.

The benefits of inland ports are being increasingly recognized in countries around the world and, for Delta specifically, the concept of moving freight by rail rather than road appears to make sense. Currently, there are an estimated 3,000 trucks per day servicing the Port, with projections up to 8,200 truck trips daily for the proposed Roberts Bank Terminal 2 port expansion. In addition, the development of Tsawwassen First Nation land for retail, industrial and residential uses is expected to generate significant traffic volumes.

[1] Corporation of Delta, Council Report, Inland Port Impact Study (March 4, 2014)

Delta is facing similar pressures to those of other port communities around the world in regard to the impact of rapidly growing container volumes and related port infrastructure. A comparison to Rotterdam reveals some interesting insights. Rotterdam is already the largest port in Europe. With the massive Maasvlakte 2 expansion, the Port of Rotterdam will double its capacity to 34 million twenty-foot container equivalent units (TEUs). Sustainable transport is a key strategy of the expansion. The Port Authority is implementing various measures. The principal one is the modal shift, obliging container terminals to transport more by inland vessels (barges) and trains and less by truck. Its website[2] states the following:

> *It is reasonable to expect that Maasvlakte 2 will lead to an enormous increase in traffic intensity on the roads around Rotterdam. However, extensive research shows that around 2033, Maasvlakte 2's contribution to traffic on the busiest roads in the region will only be a few percent.*
>
> *To ensure Maasvlakte 2's accessibility in the future, the Port Authority is already working towards distributing the cargo flows from and to the Port better between the various modes of transport. The aim is to increase the capacity of the most efficient and environmentally friendly modes of transport. This involves making more use of inland shipping and rail transport and transporting as few containers as possible via road haulage. This will prevent both congestion and pressure on the environment.*
>
> *To achieve this, the Port Authority has made concrete agreements with the operators of the container terminals on Maasvlakte 2 regarding freight transport to the hinterland. At present, over 58% of the cargo still leaves the port area on a truck. By 2033, this figure needs to be reduced to 35%. Companies will therefore be required to transport more cargo using rail and inland shipping. This measure will lead to less congestion on the motorways and lower emissions of harmful substances. This redirecting of transport from trucks to trains and inland vessels is called the modal shift.*
>
> *Accessibility is not only an issue for the Port Authority. That is why various parties in the region work together on the transport issue in a Verkeersonderneming (Traffic Management Company). In this organisation, the existing road authorities - including the Port Authority, Rijkswaterstaat and the Municipality of Rotterdam, bundle their forces to ensure the optimum circulation of road traffic in the port area.*

Inland terminals can help to relieve traffic congestion near marine terminals and relieve pressures to develop land near marine terminals for industrial and other port-related uses. This is especially concerning in Delta where much of the land close to the terminal is prime agricultural land. There are also economic investment benefits for the host community in the development of an inland terminal.

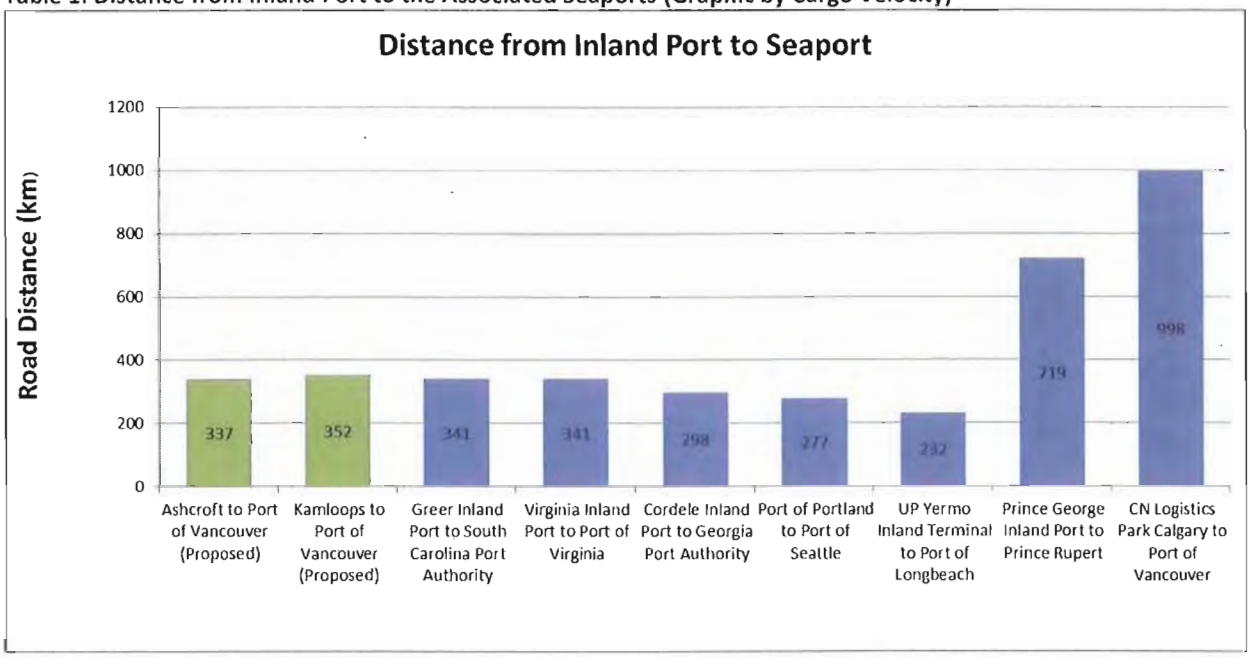
[2] Road Transport, Maasvlakte 2 (see Appendix B)

3 Review of Comparable Existing Inland Cargo Facilities

3.1 Inland Ports in Canada and the US

The concept of inland terminals is increasingly being accepted and implemented in Canada and the US. Various port authorities on the US East and South Coasts have recently added inland terminals to their portfolios. Figure 1 provides a summary of various inland ports and the associated distance to the associated seaport. **The figure shows that Kamloops and Ashcroft are a similar distance inland compared to the other facilities noted.**

Table 1: Distance from Inland Port to the Associated Seaports (Graphic by Cargo Velocity)



Appendix A provides a summary of the facilities being used for comparison in **Table 1**.

CN announced in 2007 that it will build a CAN $20-million transload centre and intermodal yard in Prince George[3]. Note the similarity between the business plan (***bold italics)*** of this facility and that of Ashcroft Terminal. ***"The Prince George facility is ideally located to tap backhaul export opportunities, filling empty containers moving to Asia via Prince Rupert with lumber, panels, woodpulp and paper, as well as ores, plastics and some metals products. It will help CN maximize revenue potential generated from the new terminal at Prince Rupert, and create new economic and employment opportunities in northern B.C."***

It has been reported that China Ocean Shipping (COSCO) and Canfor have started working together with CN Intermodal in Prince George to transload up to 350 containers a week for rail shipment to Prince Rupert's Fairview terminal.

[3] CN Memo (March 30, 2007)

3.2 Success Factors for an Inland Port Location

In 2006, the BC government released a report[4] which identified 5 key success factors for inland container terminals. They are:

1. An adequate catchment area
2. Availability of suitable land
3. Reliable and competitive rail service
4. Good access to a highway network
5. Phased development to limit initial capital investment

An inland terminal in the BC Interior would be in close proximity to one or both major Canadian railways (CN Rail shown in red and CP Rail shown in brown). A facility within the black circle in the figure below would have excellent rail and highway access (e.g. Highways 1 and 5).

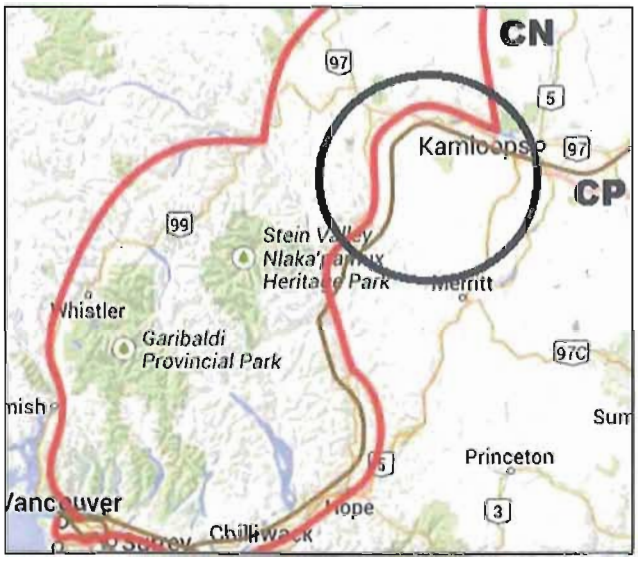


Figure 1: Proposed Location of Inland Terminal

Between now and 2031 (when Terminal 2 is projected to reach full capacity), one or more facilities could potentially be developed. They might be operated by the railroads themselves, or by private parties. The specific location of the inland terminal is also not important, since the result is similar for most inland port locations in the region considered.

The main opportunity for an inland terminal would be the transloading of export cargo into containers and shipment of these containers directly to container terminals in PMV via rail. Import cargo opportunities are expected to be limited, and were not studied, due to the following factors:

1. About 65% of all import containers are loaded directly onto eastbound trains that would bypass an inland terminal altogether.
2. Some 20 and 40-foot long import containers are trucked off the terminals and are transloaded into larger 53 foot long domestic containers to reduce transportation costs. The critical factor

[4] BC Ministry of Transportation, Inland Container Terminal Analysis (Final Report December 12, 2006)

for import demand is the size of the local market. There would be limited benefits in performing this activity in more remote locations.

3. There are an estimated 20,000 containers that are trucked annually to the Kamloops/Okanagan area. This volume would be too low to justify a scheduled rail service. This volume will grow by 2031 and may provide some opportunities for an inland terminal; however they would more likely be a complimentary offering to the main export cargo business.

PMV identifies total tonnage for 2013 by outbound containerized commodity[5]:

Table 2: Outbound containerized commodities in 2013

Commodity	2013 Metric Tonnage	% of Total
Lumber	4,499,128	30.8%
Specialty Crops	2,509,091	17.2%
Wood pulp	2,455,145	16.8%
Waste Paper	587,322	4.0%
Meat, Fish & Poultry	543,619	3.7%
Other Products of Chemical Industries	476,586	3.3%
Basic Metals	453,887	3.1%
Paper & Paperboard	409,829	2.8%
Other Cereals	320,638	2.2%
Animal	319,684	2.2%
Others	2,044,314	14.0%
Total Outbound	**14,619,244**	**100.0%**

Lumber and wood pulp are two of the largest containerized export commodities through Port Metro Vancouver. The manufacturing base for these two commodities is in the same region as the proposed inland terminals. An inland terminal in the BC Interior would therefore have an excellent catchment area for lumber and woodpulp arriving by both truck and rail.

An inland terminal in the BC Interior would therefore meet the five critical success factors:

1. An adequate catchment area: lumber and woodpulp arrive at the facility via truck or rail from manufacturing sites in BC and Alberta;
2. Availability of suitable land: the Kamloops/Ashcroft area offers extensive areas of suitable land that can be used for industrial purposes;
3. Reliable and competitive rail service: both Canadian National (CN) Rail and Canadian Pacific (CP) Rail have their main lines running through the area;
4. Good access to a highway network: Highways 1 and 5 offer fast, efficient access to Vancouver and Calgary; and
5. Phased development to limit initial capital investment: an initial investment to provide some critical mass for container and railcar handling with future phases for growth and development.

[5] PMV 2013 Statistics Overview

3.3 Export Transloading at Inland Ports for US West Coast Ports

Export transloading at inland ports is common practice at many US West Coast ports. Below are a few examples:

- Northwest Container Service (NCS) manages a service and facility in Portland, OR, that allows Matson Navigation customers to drop Hawaii-bound cargo in Portland. Cargo drop-off times, tied to vessel departures, are published to Matson customers. NCS then provides just-in time night-time rail service to Matson's facility in Seattle. In the past, Matson sailed ships to Portland. The use of this service provides Matson's customers the same Oregon drop off service that they had before. The service reduces highway truck trips between the Portland area and Seattle. This distance is about 4 hours which is similar to the distance considered in subject study.
- UP Railway has an inland terminal about 140 miles North East of Long Beach in Yermo, CA. Union Pacific offers Plant-to-Port, a transportation and transload service delivering Dried Distiller's Grains with Solubles (DDGS), grain and grain products from the Midwest to Southern California. This export program utilizes unit train hopper car shipments to a dedicated transload facility in Yermo. From there, double-stack intermodal trains will transport loaded 40-foot marine containers to Union Pacific served on-dock terminals at the Ports of Los Angeles/Long Beach.

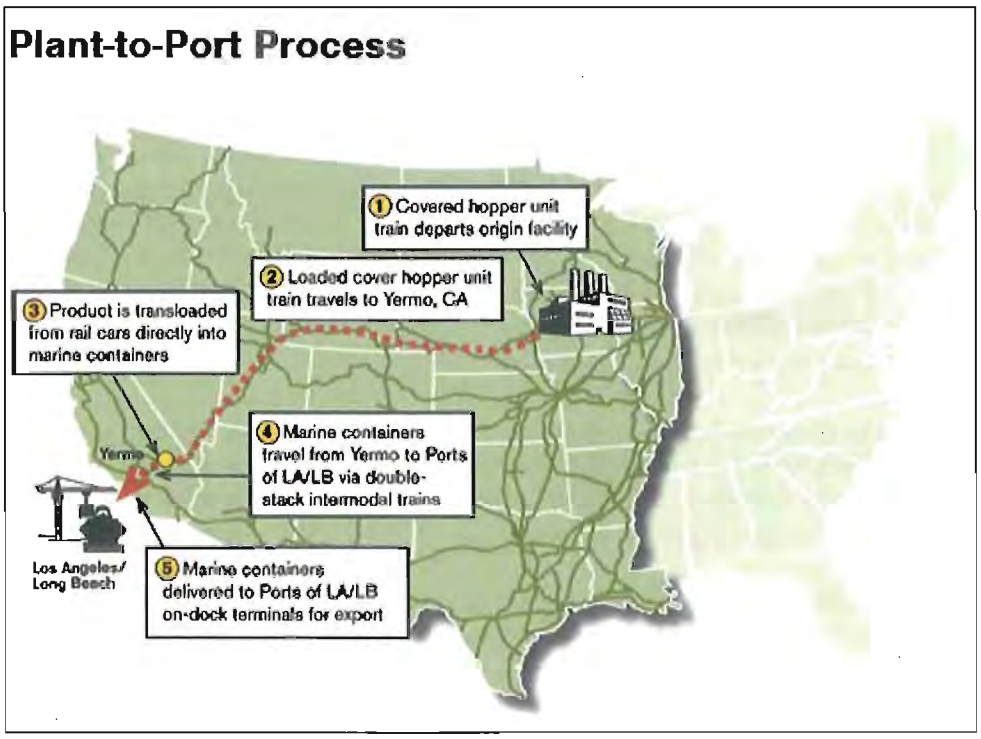


Figure 2: Plant-to-Port Process[6]

[6] Union Pacific website (see Appendix B)

3.4 Cargo Flow

Assuming that sufficient volume can be aggregated to a single link, this rail move would eliminate a portion of the following container transfers via truck (drays) within the Lower Mainland:

- Empty container move to an off-dock empty storage depot.
- Possible repositioning move to a transloading facility.
- Full container move back to a container terminal.

The current cargo flows for lumber and woodpulp are shown in the diagram below:

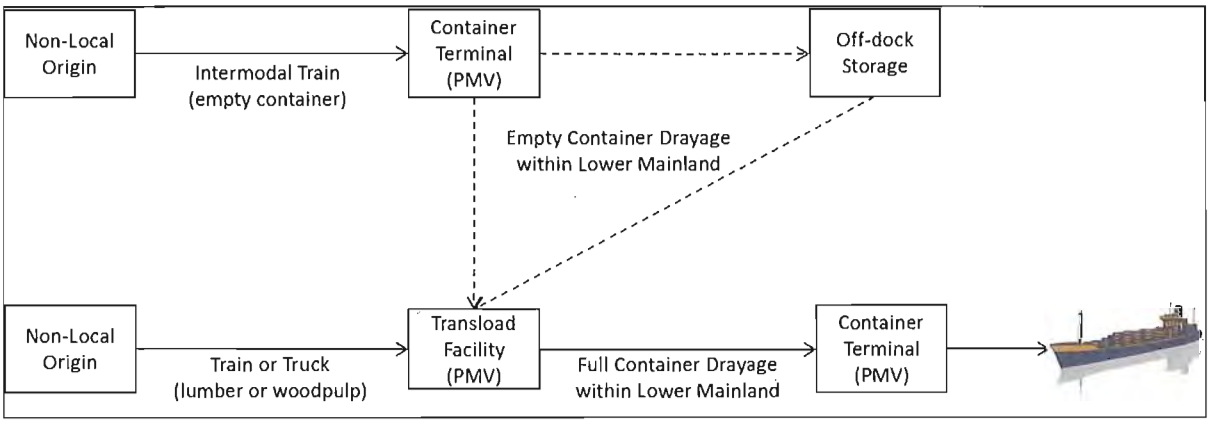


Figure 3: Cargo flows for lumber and woodpulp

The existing trade imbalance with Asia leads to a logistics situation **where 60% of all westbound rail containers are empty**. These empty containers are shipped together with export containers on intermodal trains to the container terminals. Container terminals receive these empty containers and store them in the yard. Due to space constraints on the terminals, ocean carriers typically have quotas of how many empty containers can be kept on the terminal at any point in time. Some containers are therefore trucked to an off-dock location such as an empty storage depot to manage the empty container inventory within the quota thresholds.

There are various transload facilities in the Lower Mainland that receive lumber and woodpulp from manufacturing sites via rail or truck and load them into containers for export to Asia. These transload facilities order empty containers directly from the container terminal or from an off-dock location. The stuffed containers are then drayed to container terminals and then exported to Asian markets.

Each exported container therefore requires 2-3 container truck transfers within the Lower Mainland. An inland terminal would eliminate these truck transfers as shown in the diagram below:

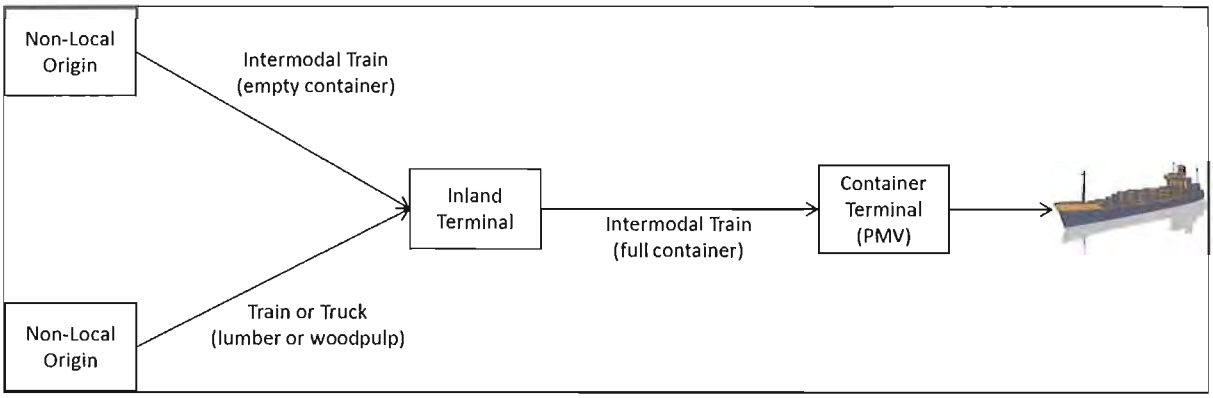


Figure 4: Cargo flow with inland terminal

In summary then, an inland terminal would have the following benefits:

- **Reduction of container truck transfers** within the Lower Mainland: An inland terminal would ship full containers via rail to PMV. This rail move would eliminate 2-3 container truck transfers between the container terminals and various container handling facilities within the Lower Mainland. The net result would be reduced congestion, pollution and accidents.
- **Faster turnaround of rail equipment** (e.g. center beam cars or boxcars): The current shortage of railcars would be alleviated by turning equipment around in the Kamloops/Ashcroft area rather than at Vancouver container terminals. It is estimated that the railcar turnaround could be improved by one to two weeks per trip.
- **Reduction of empty containers at container terminals**: The core business of container terminals is the loading of export containers to vessels and the unloading of import containers from vessels. The storage of empty containers conflicts with this core business due to limited storage capacity on the terminals. With increasing volumes, the pressure to limit empty containers on dock will also increase. Every container transloaded at an inland port would eliminate one empty container stored on container terminals.
- **Improved coordination between train arrival and vessel loading**: An inland port would enable the pre-planning of a train segment for vessel loading. An inland terminal with published cut-off times could load trains for arrival just in time for vessel loading. This would enable terminals to better plan vessel loading and to possibly load directly from rail to the vessels, e.g. during night shifts. Shippers would also benefit through better predictability of schedules and possibly lower demurrage charges.

Below is a comparison of cost categories between the two models. Note that it does not list the amount of the cost, but only the type and/or description of costs (or effort) related to the alternative.

Table 3: Relative Types of Costs of current operations vs. addition of inland terminal

Type of Cost incurred, Current Model	Type of Cost incurred, Inland Terminal
Rail: Transportation of empty container from origin (e.g. Toronto/Montreal) to Port of Vancouver	Rail: Transportation of empty container from origin (e.g. Toronto/Montreal) to Kamloops/Ashcroft • Reduction of 400 KMs
Rail/truck: Transportation of lumber/woodpulp from manufacturing site to transloading facility in Lower Mainland	Truck/rail: Transportation of lumber/woodpulp from manufacturing site to Kamloops • Reduction of 350 KMs
Truck: Empty container move from container terminal	N/A
Truck: Empty container repositioning move (if applicable)	N/A
Transloading costs in Lower Mainland	Transloading costs at Ashcroft
Truck: Full container move to container terminal	Rail: Full container move to container terminal
Demurrage/empty container storage charges in Lower Mainland and at container terminals	Demurrage/empty container storage charges at Ashcroft

This study does not assume that there is a stand-alone business case for an inland terminal. While the business case is an important consideration, the Corporation of Delta does not consider that it is the only requirement to justify an inland port. Community benefits in the face of higher truck congestion can also lead to support for the facility, and a shift in the status quo.

3.5 Inland Port Operating Principles

There are several operating principles for an inland terminal to be an effective and efficient partner in the supply chain.

Railways are on a tight schedule and cannot afford lengthy stops at an export transloading facility. An efficient and reliable service to rail operations is therefore critical to the success of such a facility. The main operating principle would be the pre-staging of railcars with full containers, ready to be hooked onto the train, and the provisioning of empty tracks to allow the quick decoupling of railcars with empty containers. The railway would simply cut railcars with empty containers from the train and pick-up pre-staged railcars with full containers. This assumption implies that the inland facility would have on-site equipment to prepare strings of railcars for departure, and to shift strings that are dropped off. If this process is streamlined, a reasonable expectation would be a stop of no longer than one hour for a west-bound train. For example, during a stop at the inland port, the railway would cut half a unit train loaded with empty containers, and add half a unit train loaded with full containers.

The inland terminal would have to keep a sufficient inventory of empty containers on hand. This could be for one shipping line or a consortium of lines. Those shipping lines would offer a service out of Kamloops/Ashcroft and offer a Kamloops/Ashcroft to Asia rate. This service would operate much like services offered at container terminals, including scheduled rail service and published cut-off times for export cargo.

Trains leaving the inland port would go directly to a single container terminal (e.g. to Deltaport).

Ashcroft Terminal and Venture Kamloops

There has been considerable private interest in the development of an inland terminal in the Kamloops/ Ashcroft area.

Ashcroft Terminal is in a unique strategic location. Every railcar traveling on the Class 1 mainlines must go directly through Ashcroft Terminal. Located at the eastern end of CP/CN mainline co-production, Ashcroft is the last location westbound and the first location eastbound at which mainline traffic can stop to or from Metro Vancouver.

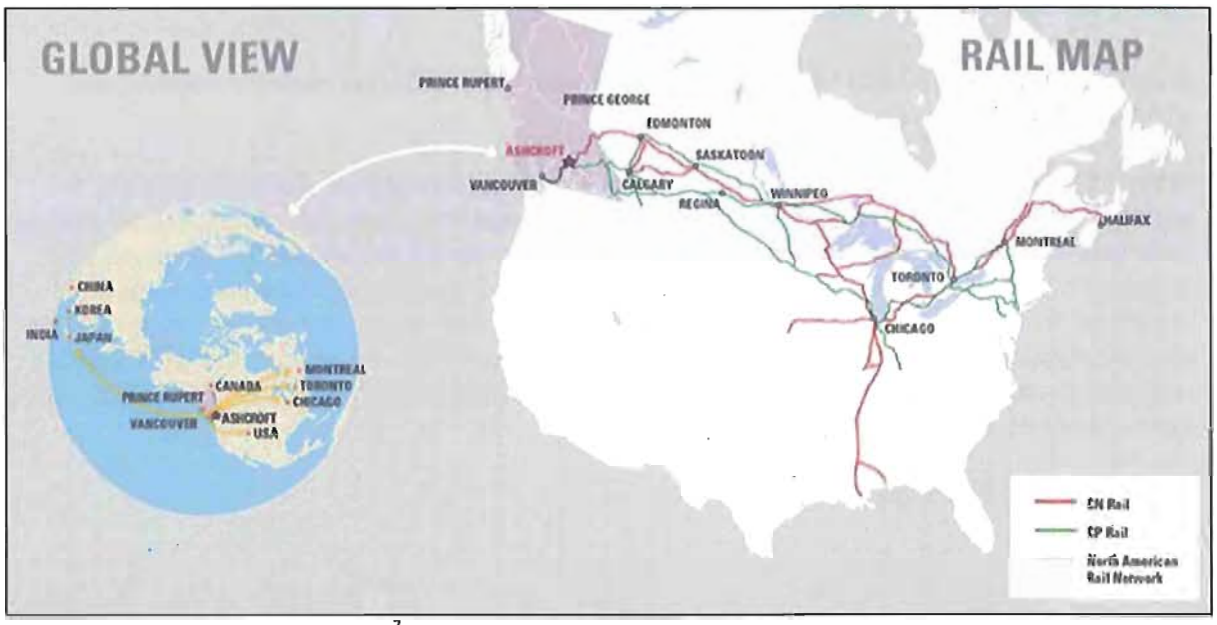


Figure 5: Ashcroft Terminal Rail Map[7]

Ashcroft's current business is focused on railcar and industrial storage, material handling, industrial transloading, and customized logistics solutions. There is an opportunity to expand the terminal and add container stuffing and handling operations. Terminal management has been working with various shippers and logistics operators to develop container transloading and handling facilities.

The Master Plan includes additional 25,000' of loop tracks and 35,000' of internal tracks on 320+ acres. The site would be accessible to all trains from the CNR and CPR mainlines (Canadian National & Canadian Pacific Railroad).

[7] Ashcroft Terminal Website (see Appendix B)

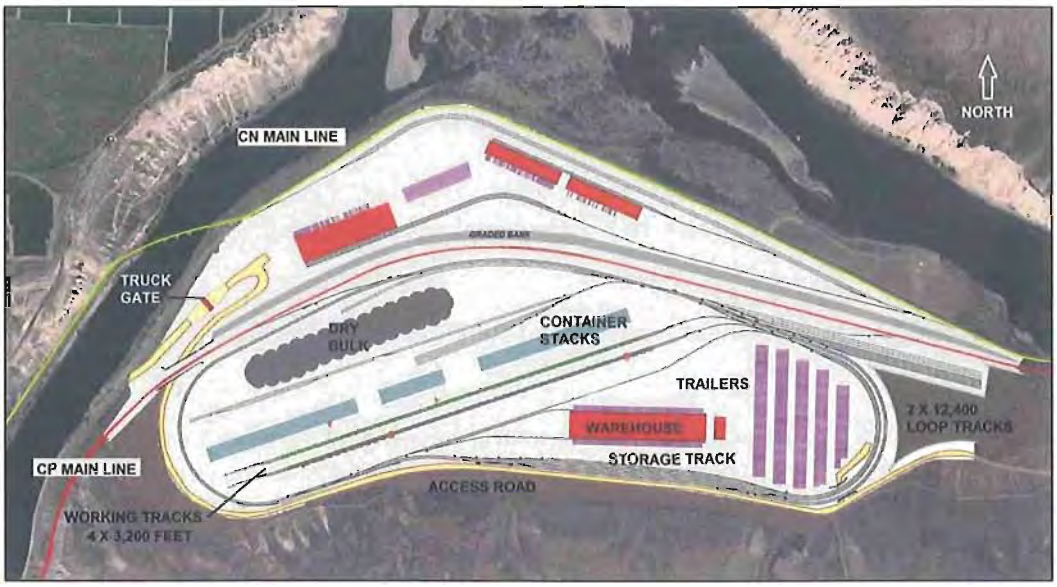


Figure 6: Proposed Ashcroft Terminal Master Plan

Intermodal trains up to 12,000 feet long would arrive from either direction, clear the mainline, and exchange car strings for hook and haul service.

Venture Kamloops, the economic development arm of the City of Kamloops, also recognizes the opportunity to develop an inland port in Kamloops. "Kamloops offers a unique opportunity for an inland intermodal container facility. The proposed location on the Trans-Canada and Yellowhead highways, combined with the line-haul efficiency of two national railways, would make it the best-situated intermodal facility in the province. It would also meet the growing need for reload and storage facilities for containerized, break-bulk, and bulk cargo moving by rail to the Vancouver Port. The community of Kamloops recognizes the value of an intermodal container facility, knowing that it will improve the city's regional and international competitiveness."[8]

[8] Venture Kamloops Website (see Appendix B)

4 MODELLING ASSUMPTIONS FOR AN INLAND PORT

The assumptions for the modelling are outlined below. The assumptions were developed in interviews with stakeholders, reviews of published documents and industry knowledge of the authors. Due to the nature of the study, some assumptions are based on references to specific documents, and others are based on projected proportions for the cases considered. The assumptions have been reviewed with key stakeholders including Port Metro Vancouver, the Corporation of Delta, and Ashcroft Terminal. In some cases, a calculation has been made for the future case considered, acknowledging the limited level of accuracy possible for such an estimate.

The numbers below are based on a 2031 scenario. At that time, it is assumed that Robert Bank Terminal 2 (RBT2) will be operating at full capacity. Our study requires that we make some assumptions about 2031 cargo volumes. Our approach is to use figures published by PMV for 2031, as well as to consider cargo volumes from 2013 and the trends moving forward. For example, the 2031 data did not include cargo tonnage by commodity, so these are extrapolated from 2013.

4.1 Volume Assumptions

Lumber and woodpulp are some of the largest export commodities through the Port of Vancouver. Assuming an average payload of 25,000 kg per container, these tonnages correspond roughly to the following container volumes:

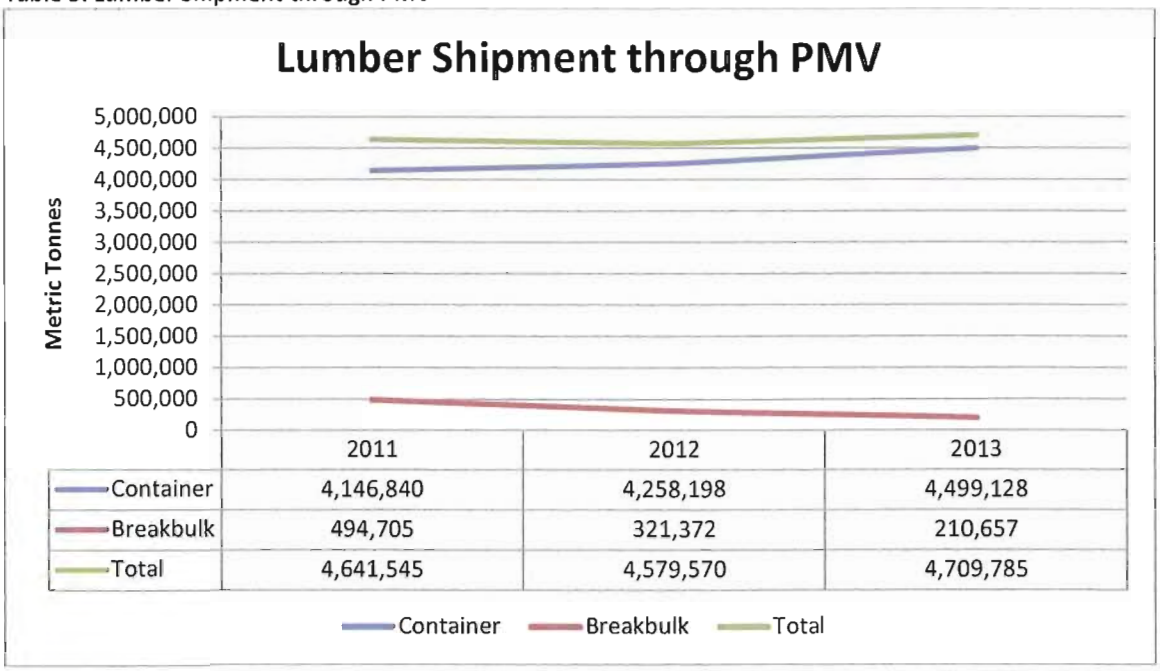
Table 4: Exports of Lumber and Woodpulp

Commodity	2013 Metric Tonnage (containerized volume)	Est. 2013 containers	Comments
Lumber	4,499,128	180,000	Primarily 40'
Wood pulp	2,455,145	98,000	Primarily 40'

Lumber

PMV's statistics show that lumber shipments grew at an average annual rate of 0.8% between 2011 and 2013. Container shipments have been growing by 4.2% and break-bulk shipments have been dropping by 34.7%. This trend is shown in the chart below:

Table 5: Lumber Shipment through PMV



	2011	2012	2013
Container	4,146,840	4,258,198	4,499,128
Breakbulk	494,705	321,372	210,657
Total	4,641,545	4,579,570	4,709,785

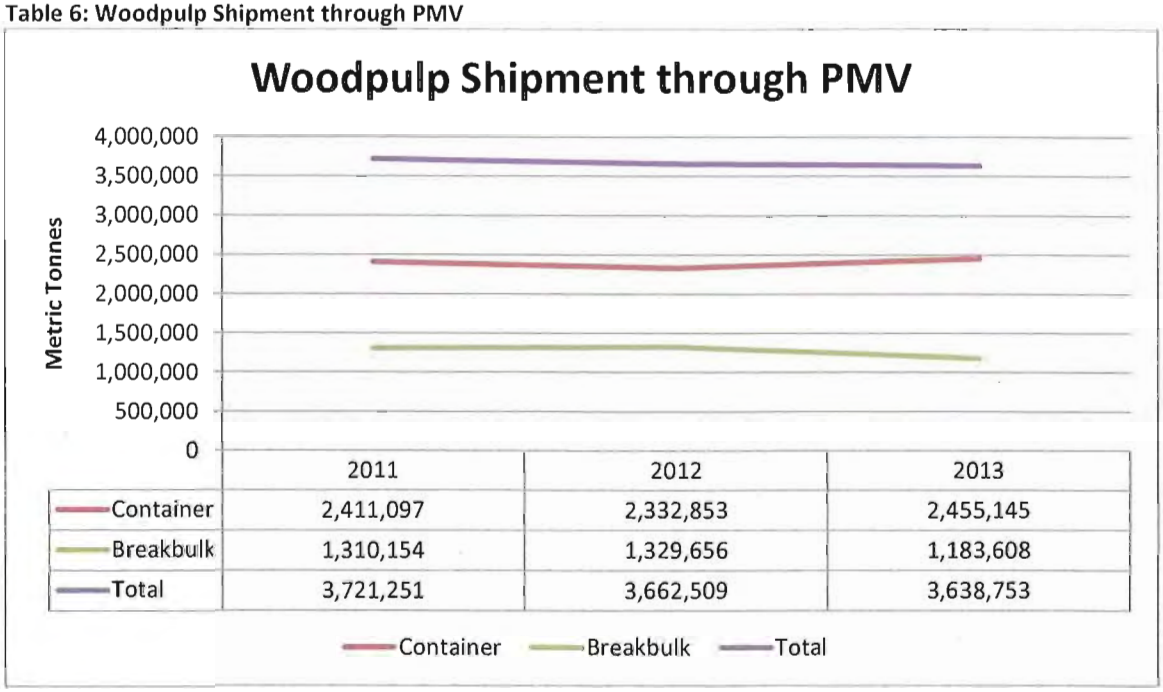
Not all lumber would pass through the inland terminal(s) for transloading. Lumber from Vancouver Island or coastal regions would not be included. For this study, it is assumed that 20% of all lumber bypasses this region. Therefore, the corresponding container volume of lumber passing through the inland terminal(s) would be approximately 144,000 = 180,000 * 80%.

A significant portion of the current export volume is driven by the temporary surge in products resulting from timber affected by the mountain pine beetle infestation. This surge is expected to fall off starting in 2016, while demand from China, India and other South East Asia countries is expected to continue to grow. It is assumed that there will be a continued average annual 4% increase in offshore shipments up until 2031. By 2031, the corresponding container volume of lumber passing through the inland terminal(s) would increase to approximately 292,000.

Wood Pulp

PMV's statistics show that wood pulp shipments through the Port of Vancouver have been decreasing at an average annual rate of 1.1% between 2011 and 2013. Containers have been growing by 1.0% and break-bulk has been dropping by 4.7% annually. This trend is shown in the chart below:

Table 6: Woodpulp Shipment through PMV



	2011	2012	2013
Container	2,411,097	2,332,853	2,455,145
Breakbulk	1,310,154	1,329,656	1,183,608
Total	3,721,251	3,662,509	3,638,753

The vast majority of Canada's pulp mills are located in the BC Interior, Alberta and Eastern Canada. There are only 3 pulp mills which are located in Coastal BC. These three mills would not ship their products through an inland terminal.

1. Howe Sound Pulp and Paper Ltd. (Paper Excellence)
2. Catalyst Paper's Crofton Mill
3. Harmac Pacific's pulp mill near Nanaimo

It is estimated that these mills represent less than 5% of the total export volume. Therefore, the corresponding container volume of woodpulp passing through the inland terminal(s) would be approximately 93,000 = 98,000 * 95%.

While wood pulp exports continue to grow, international competition will result in a lower growth rate than lumber exports. Growth regions are China and India. China has been investing in pulp mills (e.g. Paper Excellence) which will likely result in an increase in offshore container shipments to Asia. We can conservatively assume that we will see a 15-20% growth by 2020. We are assuming a continued averaged 2% increase in offshore shipments between 2013 and 2031. By 2031, the corresponding container volume of lumber passing through the inland terminal(s) would increase to approximately 133,000.

In summary, we are assuming a total 2031 equivalent container volume (lumber and wood pulp) of about 425,000 passing through the inland terminal(s). Only a small portion of that volume would actually by transloaded by the inland terminals. The vast majority of this cargo would pass by the inland terminals for continued transloading in the Lower Mainland.

4.2 Capacity Assumptions

It is difficult to accurately predict the capacity of inland terminals by 2031. There is a critical mass of containers that an inland terminal has to handle for trains to stop. For the purpose of this study, it is assumed that this volume is half a unit train. This would translate into approximately 180 containers for half a unit train with a total length of 12,000 feet.

A daily throughput of 180 containers for a 6 day work week (Monday – Saturday) would translate into 1,080 containers a week, or 56,160 containers a year.

A potential scenario would therefore be 56,000 containers per year. Higher or lower annual throughputs are possible, and would impact the results of this study linearly. For example, if the inland terminal handled a full unit train on a daily basis, the benefits would double. Conversely, if the terminal only handled half of a unit train every second day, the forecasted benefits would be halved.

PMV's 2013 statistics indicate a cargo split of roughly 65% lumber and 35% wood pulp. It is assumed that an inland terminal would handle a similar cargo mix.

The chart below summarizes assumed cargo volumes in 2013 vs. 2031, and the estimated share of the inland terminal.

Table 7: Lumber and Woodpulp Transfer via Vancouver 2013 vs. 2031

The study assumes that one or more inland terminals are developed and would handle the volumes of cargo indicated below. The specific total cargo volume handled by the inland facility is not important to justify for the purposes our study, because we assume a linear relationship between traffic impacts and actual cargo handled. So, if twice the cargo is handled in 2031 compared to what is assumed, then approximately twice the traffic impacts would accrue.

4.3 Impacts on Container Truck Transfers in the Lower Mainland

Each container transloaded at an inland facility would eliminate the following container truck transfers within the Lower Mainland:

- Empty container move to an off-dock location.
- Possible repositioning move from the off-dock location to a transloading facility.
- Full container move from transloading facility to a container terminal

If the inland terminal(s) has an annual throughput of 56,000 containers, then the same number of containers would not have to be drayed from container terminals to an off-dock location.

It is unknown where the containers would originate from, therefore, it is assumed that empty containers would originate from all container terminals and that the number of empty containers correlates to the annual throughput of each of the terminals. In reality, the volumes of an inland terminal will be more concentrated on 1 or 2 terminals. If the distribution changes, origin-destination pairs may change but the overall traffic impacts would be similar.

By 2031, it is assumed that Terminal 2 will be operating at full capacity. This is based on the following forecasted annual throughputs at full capacity:

- Deltaport (2.4 million TEUs)
- RBT2 (2.4 million TEUs)
- Centerm (1.8 million TEUs)
- Vanterm (1 million TEUs)

Fraser Surrey Docks may or may not handle containers by 2031; however it is excluded from the calculations as volumes are estimated to be too small for significant aggregation.

Therefore, by 2031, 31.5% of empty containers would therefore originate from Deltaport, 31.5% from RBT2, 24% from Centerm and 13% from Vanterm.

Another assumption is that half of the empty containers would go directly to the transloading facility and the other half would go to an empty storage depot or other off-dock location first. A repositioning move would then be required from the empty depot to the transloading facility.

The origin-destination pairs of these moves (cargo transfers) are unknown. Therefore, it is assumed that the off-dock locations are distributed based on current estimated volumes for empty containers:

- 40% Tilbury
- 35% Richmond Logistics Center
- 10% Annacis Island
- 10% Mitchell Island
- 5% Other locations

The trans-loading facilities are distributed based on current estimated volumes:

- 50% Richmond Logistics Center
- 25% Tilbury
- 15% Fraser Surrey
- 5% Mitchell Island
- 5% Other locations

Based on the above assumptions, the following single-shift truck transfers (drays) could be avoided in 2031:

Empty Containers from Container Terminals

Table 8: Empty Container Truck Transfers from Container Terminal to Off-dock Location (not transloading facility)

Origin / Dest.	Tilbury	RLC	Annacis	Mitchell	Other	Total
Deltaport	3,528	3,087	882	882	441	**8,820**
RBT2	3,528	3,087	882	882	441	**8,820**
Centerm	2,688	2,352	672	672	336	**6,720**
Vanterm	1,456	1,274	364	364	182	**3,640**
Total	**11,200**	**9,800**	**2,800**	**2,800**	**1,400**	**28,000**

Table 9: Empty Container Truck Transfers from Container Terminal Direct to Transloading Facility

Origin / Dest.	RLC	Tilbury	F. Surrey	Mitchell	Other	Total
Deltaport	4,410	2,205	1,323	441	441	**8,820**
RBT2	4,410	2,205	1,323	441	441	**8,820**
Centerm	3,360	1,680	1,008	336	336	**6,720**
Vanterm	1,820	910	546	182	182	**3,640**
Total	**14,000**	**7,000**	**4,200**	**1,400**	**1,400**	**28,000**

Empty Container Repositioning

Table 10: Empty Container Truck Transfers from Off-dock Location to Transloading Facility

Origin / Dest.	RLC	Tilbury	F. Surrey	Mitchell	Other	Total
Tilbury	5,600	2,800	1,680	560	560	**11,200**
RLC	4,900	2,450	1,470	490	490	**9,800**
Annacis	1,400	700	420	140	140	**2,800**
Mitchell	1,400	700	420	140	140	**2,800**
Other	700	350	210	70	70	**1,400**
Total	**14,000**	**7,000**	**4,200**	**1,400**	**1,400**	**28,000**

Full Containers to Container Terminals

Table 11: Full Container Truck Transfers from Transloading Facility to Container Terminal

Origin / Dest.	Deltaport	RBT2	Centerm	Vanterm	Total
RLC	8,820	8,820	6,720	3,640	**28,000**
Tilbury	4,410	4,410	3,360	1,820	**14,000**
F. Surrey	2,646	2,646	2,016	1,092	**8,400**
Mitchell	882	882	672	364	**2,800**
Other	882	882	672	364	**2,800**
Total	**17,640**	**17,640**	**13,440**	**7,280**	**56,000**

The total anticipated impact is the avoidance of 140,000 truck trips annually within the Lower Mainland.

In addition, it is assumed that the 2013 ratios of empty chassis (truck trailer) moves will not change significantly by 2031:

- 37% of truck trips to or from a container terminal are made without a container loaded on the chassis.
- 37% of truck trips to or from a container handling facility are made without a container loaded on the chassis.

4.4 Impacts on Truck Traffic to/from the Lower Mainland

At present, the vast majority of cargo is shipped in bulk to the Lower Mainland where it is transloaded into containers. Due to railcar shortages, lack of rail access and other factors, a significant portion of that bulk cargo is trucked to the Lower Mainland. If this cargo were transloaded at an inland terminal, the bulk truck trip to the Lower Mainland could be avoided.

Wood Pulp

Wood pulp is predominately shipped in boxcars or dry vans to the Lower Mainland. It is assumed that 85% of all shipments are by rail and 15% are by truck. The higher proportion of rail shipments is based on a high degree of rail access at both origins and destinations, and reduced railcar shortages due to mills owning all or some of their rail equipment.

It is also assumed that one dry van can carry 12 units of wood pulp and that a 40' container can carry 14 units. Therefore one dry van is equivalent to 86% of a fully loaded 40' container.

These shipments would originate at one of 11 pulp mills in the interior of BC. All truck loads would pass through Hope, BC. The table below calculates the reduction in travel distance outside of the Lower Mainland. If the assumed location of the inland terminal is Kamloops, BC, then the average reduction in travel distance is 117 km. On average, a truck would have to travel 117 km less to Kamloops for transloading in the BC interior than to Hope for transloading in the Lower Mainland.

Table 12: Transportation Savings

		Distance (in KM) to		
Company	Origin	Hope	Kamloops	Reduction
Canfor Taylor Pulp	Taylor	1,054.0	945.0	109.0
Cariboo Pulp & Paper (West Fraser)	Quesnel	514.0	405.0	109.0
Mercer International Celgar Mill	Castlegar	469.0	456.0	13.0
Intercontinental Pulp (CPLP)	Prince George	636.0	527.0	109.0
Northwood Pulp (CPLP)	Prince George	636.0	527.0	109.0
Paper Excellence Mackenzie Mill	Mackenzie	819.0	709.0	110.0
Prince George Pulp and Paper (CPLP)	Prince George	636.0	527.0	109.0
Quesnel River Pulp (West Fraser)	Quesnel	514.0	405.0	109.0
Paper Excellence Skookumchuck Mill	Skookumchuck	755.0	553.0	202.0
Chetwynd Pulp (Paper Excellence)	Chetwynd	937.0	828.0	109.0
Domtar Kamloops Mill	Kamloops	204.0	0.0	204.0
AVERAGE FOR ALL LOCATIONS		**652.2**	**534.7**	**117.5**

In addition, the truck trip between Hope and the transloading facility could be avoided completely. Based on the following assumptions, this would translate into roughly 3,400 dry van trips annually.

- Annual throughput of 56,000 containers
- 35% of the annual throughput is wood pulp (17,500)
- 15% of the annual wood pulp throughput is trucked in bulk to the Lower Mainland (equivalent of 2,625 containers)
- A dry van can hold the equivalent of 12/14th of a container load

These estimated 3,400 dry van trips would be distributed as follows:

Table 13: Distribution of Dry Van Trips

Origin / Dest.	RLC	Tilbury	F. Surrey	Mitchell	Other	Total
Hope, BC	1,700	850	510	170	170	**3,400**

In addition, these 3,400 dry vans would travel 117 km less on average in the BC interior.

Lumber

Lumber is predominately shipped in center beam railcars or B-trains to the Lower Mainland. We have assumed that 50% of all shipments are rail and 50% are truck. The lower proportion of rail shipments is based on limited rail access at origins and destinations, and higher levels of railcar shortages.

The maximum payload of a B-train is estimated at 96,000 lbs. or 43,500 kg which is the equivalent of about 1.75 40' containers.

These shipments would originate at different sawmills and solid wood manufacturing sites in BC. These sites are in the hundreds and so the calculation of the detailed travel distance reduction is outside of the scope of our study. For ease of calculations, we have assumed a similar 117 km reduction by transloading cargo in Kamloops rather than in the Lower Mainland.

In addition, the truck trip between Hope and the transloading facility could be avoided completely. Based on the following assumptions, this would translate into roughly 10,400 B-train trips annually.

- Annual throughput of 56,000 containers
- 65% of the annual throughput is lumber (32,500)
- 50% of the annual lumber throughput is trucked in bulk to the Lower Mainland (equivalent of 16,250 containers)
- A B-train can hold the equivalent of 1.75 container loads

These estimated 10,400 B-train trips would be distributed as follows:

Table 14: Distribution of B-train Trips

Origin / Dest.	RLC	Tilbury	F. Surrey	Mitchell	Other	Total
Hope, BC	5,200	2,600	1,560	520	520	**10,400**

In addition, these 10,400 B-trains would travel on average 117 km on in the BC interior.

For both dry vans and B-trains, there are limited backhaul opportunities. It is assumed that 90% of truck trips to the manufacturing sites are made without a load.

5 SUMMARY OF IMPACTS ON TRUCK TRAFFIC

Below is a summary of all truck transfers moves that could be avoided in the Lower Mainland if 56,000 containers were transloaded in the BC interior annually:

Table 15: Truck Trips and Travel Distance Reductions

Equipment Type	Annual Truck Moves Reduced in LM (with cargo)	% Truck Trips without a Backhaul	Annual Truck Moves in LM (without cargo)	Total Annual Truck Moves Reduced in LM	Travel Distance Reduction in BC Interior (in KMs)
Container Trucks	140,000	37%	51,850	191,850	0
Dry Vans	3,400	90%	3,060	6,460	755,820
B-Trains	10,400	90%	9,360	19,360	2,265,120
Total	**153,800**		**64,270**	**217,670**	**3,020,940**

In order to estimate the potential impact of removing these 217,670 truck transfers moves in the Lower Mainland, the regional transportation model was utilized. Four traffic scenarios with an inland cargo terminal, in addition to a base case scenario (without inland cargo terminal), were modelled for the horizon year 2031 as shown in **Table 16**.

The most recent version of the Gateway Sub-Area Model (GSAM) EMME regional transportation model was used to conduct this analysis. The GSAM model's scope covers the Lower Mainland (Lions Bay to Hope) and includes a private vehicle and a truck component. Trucks with three or more axles are classified as 'heavy trucks' in the model. As such, the truck trips described in **Table 15** are classified as heavy trucks. As the model is an AM peak hour (7:30-8:30 am) model, the potential number trucks removed from the network for each scenario were scaled down from annual figures[9]. A "lift" is a transfer of a cargo container, regardless of size.

Table 16: Description of the Traffic Scenario at Inland Cargo Facility

Scenario	Description
Base Case	2031, No Inland Cargo Terminal
Scenario 1	2031, Inland Terminal with 56,000 lifts (~217,000 truck trips removed per annum)
Scenario 2	2031, Inland Terminal with 2 times the lifts (~217,000x2 truck trips removed per annum)
Scenario 3	2031, Inland Terminal with 3 times the lifts (~217,000x3 truck trips removed per annum)
Scenario 4	2031, Inland Terminal with 4 times the lifts (~217,000x4 truck trips removed per annum)

The total truck moves described in **Section 4.3** were converted into am peak hour matrix form and batched into the EMME model for analysis. The truck trips associated with a potential inland container terminal were then assigned to the regional road network where they have to compete for the same road space as private vehicles. **Figure 7** shows the movement of 'removed' forest product trucks in the

[9] A factor of 1/3,120 was used to scale down trips from annual to peak hour based on the associated drayage trucks operating 6 days per week, 52 weeks per year and an am peak hour to daily equivalent of 10.

AM peak hour in Scenario 1. As expected, most of the movement is associated with Deltaport, Robert Banks 2, Centerm and Vanterm. A few key corridors such as South Fraser Perimeter Road, Knight St, portions of Highway 99 and Highway 91 and Highway 1 are highly utilized by these trucks.

Figure 7: Forest Products Trucks Movements (Scenario 1)

Table 17 summarizes the network-wide morning peak hour modelling results in terms of vehicle-kilometres (VKT) and vehicle-hours travelled (VHT) if these truck trips were removed from the road network. The transportation model is able to re-assign all other vehicle and truck trips which would utilize the freed up road space. Overall there is a travel time benefit for other road users if these truck trips were removed from the network. **Table 18** shows a similar summary table but with a specific focus on road links only in Delta, where a substantial amount of the truck activity occurs. Both of these figures show that there are substantial savings in truck VKT and VHT and associated savings in energy use and greenhouse gas emissions with a potential inland container terminal in operation.

Table 17: Morning Peak Hour Modelling Results

Network Statistic	Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	No Inland Cargo Terminal	(Main Scenario)	(Sensitivity Analysis)		
Vehicle Kms Travelled (includes passenger vehicles and trucks)	5,185,450	5,182,480	5,179,440	5,176,430	5,173,470
Vehicle Hrs Travelled (includes passenger vehicles and trucks)	136,420	136,240	136,070	135,870	135,690
Heavy Trucks Kms Travelled	284,980	282,060	279,120	276,190	273,320
Heavy Truck Hrs Travelled	9,620	9,550	9,480	9,410	9,350

Table 18: Morning Peak Hour Modelling Results - Delta Road Links Only

Network Statistic	Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Percent Change			
	No Inland Cargo Terminal	(Main Scenario)	(Sensitivity Analysis)			Sc 1 vs B.C.	Sc 2 vs B.C.	Sc 3 vs B.C.	Sc 4 vs B.C.
Vehicle Kms Travelled (includes passenger vehicles and trucks)	241,460	240,790	240,120	239,470	238,870	-0.30%	-0.60%	-0.80%	-1.10%
Vehicle Hrs Travelled (includes passenger vehicles and trucks)	4,270	4,240	4,200	4,180	4,140	-0.70%	-1.60%	-2.10%	-3.00%
Heavy Trucks Kms Travelled	40,690	39,890	39,200	38,440	37,780	-2.00%	-3.70%	-5.50%	-7.20%
Heavy Truck Hrs Travelled	660	640	610	590	570	-3.00%	-7.60%	-10.60%	-13.60%

To put these numbers into context, the results have been compared to other related metrics. Based on the 'Container Capacity Improvement Program, Road Traffic Distribution Report' (Sept. 2012), 7,400 daily heavy truck trips in and out of Deltaport and RB-2 are forecasted by 2031. With the scenario assumptions presented in this section, the expected ratio of trucks removed in and out of Deltaport and RB-2 to total trucks is as follows:

Table 19: Heavy Trucks Removed (Ratio to Total Trucks in and out of Deltaport and RB-2)

Scenario	Heavy Trucks removed
Scenario 1	1 out of 28
Scenario 2	1 out of 14
Scenario 3	1 out of 9
Scenario 4	1 out of 7

According to the GSAM model base and forecast figures, heavy truck trips will grow by 2.2% (CAGR) between 2011 and 2031. This translates to an extra 720,000 heavy trucks in the lower mainland on average annually. **Table 20** compares the expected number of truck trips removed as a ratio of the forecast and hypothetical growth scenarios (in months and years) for each of the four modelled scenarios. In other words, these metrics show how long a potential inland container terminal would offset growth in the regional trucking sector.

Table 20: Savings as Ratio of Annual Growth (2011 as Base)

	Scenario1	Scenario 2	Scenario 3	Scenario 4
Number of Annual Truck trips removed:	217,000	434,000	651,000	868,000
Growth Rate	**Savings as ratio of annual growth with 2011 as**			
2.2% (modelled)	**3 - 4 months**	**7 - 8 months**	**10 -11 months**	**1.2 -1.3 years**
0.5% (slow)	1.6 -1.7 years	3.3 -3.5 years	5 - 5.2 years	6.6 - 6.8 years
1.5% (moderate)	5 - 6 months	11 - 12 months	1.4 - 1.5 years	1.9 - 2 years
3% (aggressive)	2 - 3 months	5 - 6 months	7 - 8 months	10 - 11 months

6 Inland Cargo Facility Economic and Social Benefit Analysis

6.1 Economic Impact Results of Annual Vehicle Trip Savings

The following tables display the economic impact results for the four traffic scenarios shown in **Table 16** at the Inland Cargo Facility in 2031.

Table 21: Annuals Savings ~Kilometers Travelled and Vehicle Hours Travelled and Estimated Equivalent Employment

Savings Metric	Scenario1 vs Base Case	Scenario 2 vs Base Case	Scenario 3 vs Base Case	Scenario 4 vs Base Case
Heavy Truck Kilometers Travelled	9,250,800	18,744,960	28,123,680	37,371,360
Vehicle Hrs Travelled (includes passenger vehicles and trucks)	320,320	637,910	995,540	1,328,600
Estimated Person Years of Employment*	147	293	458	611

***Note:** Annual vehicle hours travelled converted to person years of employment based on 2,176 hours of work per annum per person year. Truck drivers, on average, work nearly 48 hours per week[10] compared to 40 hours per week for other occupations.

The following economic impact results for each scenario are based on the estimated person years of employment saved due to the operations at Ashcroft Inland Port in 2031.

Table 22: Direct Economic Impact of Trucking Employment Savings in 2031 by Scenario

Scenario	Type of Impact	Employment (Person Years)	Wages ($ Millions)	GDP ($ Millions)	Economic Output ($ Millions)
1	Direct	147	8	10	28
2	Direct	293	16	20	55
3	Direct	458	25	31	86
4	Direct	611	34	41	114

Note: Wages, GDP and Economic Output are presented in 2014 dollars.

An inland terminal will create new jobs in the area in which it is located. Venture Kamloops studied the job impacts of a terminal associated with that project in 2006 and developed the following employment projections[11]:

[10] Service Canada Website (see Appendix B)
[11] Opportunity Assessment for an Inland Intermodal Container Facility in Kamloops, September 2006

Table 23: Direct Economic Impact of Inland Terminal

Type of Employment	Number of Jobs Projected	Comments
Terminal Operations	20 per shift	Up to 3 shifts per day, depending on volumes
Manufacturing Sector	75	Plant expansions and new plants
Transportation Sector	50	New trucking operations

The potential job impacts at Ashcroft terminal have not been estimated by that project. However, we anticipate that terminal operations employment would be in the range of ten to twenty persons per shift worked.

6.2 Social Benefits of Reducing Truck Traffic to Communities

Reducing truck traffic to communities may result in a number of social benefits, as follows:

- **Increased road safety**. According some statistics from the National Highway Traffic Safety Administration in the U.S, heavy trucks account for 0.5% to 1% of the traffic on most roads, but account for up to 8% of fatal vehicular accidents.[12] Thus, any reduction of truck traffic would likely yield a greater reduction is accident rates and increase road safety.

- **Reduced road degradation**. Road damage is a function of the weight they bear. As a truck can weigh many times that of a commuter vehicle it can do proportionally more damage. Thus, any reduction of truck traffic would decrease the damage to roads and the cost of repairing them.

- **Environmental Benefit - Carbon Footprint**. As a result of their inefficiencies, truck transport has a noticeable carbon footprint. By reducing the number of vehicle trips, correspondingly reduces the carbon footprint and thus lessens the negative impact on the environment.

6.3 Social Benefits of Farmland Retention

- **Economics**. In 2012, BC's agriculture industry had a GDP of $1.1 billion, a 2.7% increase over 2011.[13] Moreover, $1.6 billion in product was exported.[14] The agriculture industry is both financially sound and competitive but is dependent on the continual existence of land to farm.

- **Availability of local produce**. Imported food must overcome several logistics problems associated with their transport. Imported food items are picked green in order to maximize their shelf life, which decrease their flavor and nutrition.[15] Also transporting food several thousand kilometers, primarily via trucks, adds an additional dollar and carbon costs to their production. Both of these problems are not present in locally grown food items. Also buying local produce supports the local economy and is normally cheaper than their imported counterparts. Due to these benefits, local farmland retention should be encouraged.

[12] NHTSA Traffic Safety Facts 2008, Washington
[13] Source: Ministry of Agriculture. Fast Stats 2012. Victoria: Ministry of Agriculture: Province of British Columbia.
[14] Ibid.
[15] Source: Kathleen, F. (2007). Is local more nutritious? Boston: Harvard School of Public Health.

- **Farmland is a finite resource**. Due to its geography, approximately 4% of BC's land is viable for farming, a notable percentage of which is in the Lower Mainland.[16] However, this viable farmland is also prime real-estate leading to potential conflict between land developers and farmers. As a result, the Greater Vancouver Area losses 1.5 square kilometer of farmland per year.[17] A possible benefit of shifting a portion of cargo-handling inland includes reducing industrial use of farmland. Prime agricultural land in Delta could be conserved for farming purposes, while the more arid land in the Kamloops/Ashcroft area would be ideal for industrial purposes. The Delta Agricultural Profile, as part of the Delta Agricultural Plan[18], concludes the following: "Incremental conversions of farmland to non-farm uses continue to this day despite the fact that the ALR was instituted in 1973. Incremental losses of land to transportation projects, port expansion, and treaty settlements are reducing the land base for farming and jeopardizing the ability to continue existing crop rotations."

[16] Source: Agricultural Land Commission (2013). Annual Report 2012/2013. Victoria: Minister of Agriculture.
[17] Ibid.
[18] Delta Agricultural Plan, Phase 1: Delta Agriculture Profile (June 2011)

7 ENVIRONMENTAL BENEFIT ANALYSIS

The primary environmental benefit calculated from the analysis was the reduction of carbon dioxide (CO_2) and other greenhouse gas (GHG) emissions from diesel fuel combustion. The fewer heavy truck kilometres travelled throughout the Lower Mainland and in Interior British Columbia means that less diesel fuel is consumed.

There are also a number of secondary benefits including a decrease in congestion/vehicle idling within the Lower Mainland and corresponding reduction in air contaminants.

The primary carbon emissions calculation was completed in the following manner:

1. Sum total distance reduced broken down by road grade[19] and weight of truck (i.e. empty or loaded)[20].
2. Multiply by fuel efficiency of Class 8 freight trucks for truck weight and road grade[21] to obtain total volume of diesel fuel saved.
3. Multiply by Environment Canada emissions factors[22] for diesel (Heavy-duty on Road Vehicles) to obtain greenhouse gas emissions savings (in carbon dioxide equivalent).

The following results were obtained for 56,000 containers per year in 2031 (Scenario 1):

Table 24: Fuel Savings and Greenhouse Gas Emissions Reductions

Result	Fuel Savings (litres diesel)	Greenhouse Gas Emissions Reduction (tonnes CO_2e)
Shorter distance driven in Interior British Columbia	1,161,061	3,124
Elimination of truck trips in Lower Mainland	2,358,620	6,347
Total annual reduction/benefit	3,519,681	9,471

The carbon emissions savings per container if processed through an inland terminal instead of at a transloading facility in the Lower Mainland is 169 kilograms of carbon dioxide

For each scenario, against the base case, the following are the estimated results:

[19] Source: Google Earth elevation profile analysis of possible routes.
[20] Source: Hajek, Hein, Swan. Transportation of Raw Forest Products in Northern Ontario by Trucks. International Conference on Heavy Vehicles HVParis 2008.
[21] Source: Franzese, Oscar. Effect of Weight and Roadway Grade on the Fuel Economy of Class-8 Freight Trucks, Oak Ridge National Laboratory, ORNL/TM-2011/471, October 2011. And, The National Academies, Technologies and Approaches to Reducing the Fuel Consumption of Medium and Heavy-Duty Vehicles, 2010.
[22] Source: Environment Canada National Inventory Report 1990-2010.

Table 25: Carbon Emissions Reductions by Scenario

Activity	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Containers through inland terminal	56,000	112,000	168,000	224,000
Number of Annual Truck trips removed	217,000	434,000	651,000	868,000
Carbon emissions reductions (tonnes CO2e)	**9,471**	**18,942**	**28,413**	**37,884**

8 Conclusions and Next Steps

This study showed that there are significant traffic, economic, social and environmental benefits of an inland terminal.

- Traffic benefits of the inland terminal over status quo:
  - More efficient cargo & empty container movements
  - Fewer trucks on the road/reduced traffic congestion
  - 360 fewer one-way truck trips/day to/from Deltaport and RBT2 (5%)
  - 218,000 fewer truck trips annually in Lower Mainland
  - 12 million fewer truck kilometres driven
- Economic, social and environmental benefits include:
  - Reduced carbon emissions (about 10,000 tonnes per year)
  - Economic investment & job creation in the Ashcroft/Kamloops region
  - Industrial property development to sustain port traffic is developed on inland property
  - Reduced pressure to develop local farmland
  - Distributing economic benefits of port activity inland

The results were presented at the June 19th Ashcroft Terminal Stakeholders Meeting to about 50 stakeholders.

NEXT STEPS

While this study is an important step in the right direction, additional work is required to operationalize an inland terminal and to understand the full impacts, including:

- The EMME transportation model is currently updated by Translink with inputs from Port Metro Vancouver. The traffic impacts should be updated with the latest findings once the Translink update is completed in late summer 2014.
- Further work is required to better understand the impacts of an inland terminal on all parties (shippers, receivers, railways, shipping lines, trucking companies, etc.) including quantitative analysis of improved efficiencies of the inland port model.
- This report assumed a linear relationship between the container volumes at an inland terminal and the related benefits. In reality, this relationship will be cumulative. With decreased congestion on Lower Mainland roads, the overall transportation network will become more efficient and reduce travel times for all vehicles. For example, a truck driver may be able to increase the amount of trips in a working day due to decreased wait times and be more productive in a less congested road network. This relationship needs to be explored further to better plan volume targets for inland terminals.

The Corporation of Delta provided funding for the first step. Collaboration and funding from other levels of Government (Federal, Provincial, PMV) is required to take this concept to the next level and to move forward with developing an inland port infrastructure in BC.

APPENDIX A – OVERVIEW OF INLAND TERMINALS

South Carolina Port Authority: The South Carolina Inland Port (http://www.port-of-charleston.com/Cargo/Facilities/sc_inland_port.asp) opened in October 2013, extending the Port of Charleston's reach 212 miles inland to Greer, S.C., and providing shippers with access to more than 95 million consumers within a one-day drive. The inland port boosts efficiency for international freight movements between the Port of Charleston and companies located across the Southeast, and the project is expected to create additional economic investment in the South Carolina Upstate, where BMW, Michelin and other international manufacturers already operate.

Figure 8: South Carolina Inland Port

Norfolk Southern serves the inland port through its main rail line, and the facility is positioned along the Interstate 85 corridor between Charlotte and Atlanta, where Norfolk Southern operates additional rail yards. Norfolk Southern will take 25,000 truck moves off I-26, saving fuel and emissions as well as alleviating congestion. The inland port adds an additional benefit – access to empty containers – for regional shippers who can send trucks to Greer for the containers they need to move their goods.

The Port of Virginia: The Virginia Inland Port (VIP) (http://www.portofvirginia.com/facilities/virginia-inland-port.aspx) just west of Washington, D.C. in Warren County, Virginia, is 220 miles inland and effectively brings the benefits of The Port of Virginia 220 miles closer to U.S. markets. Five-days-a-week rail service between VIP and the marine terminals in Hampton Roads allows direct access to the trade routes of 50 international shipping lines.

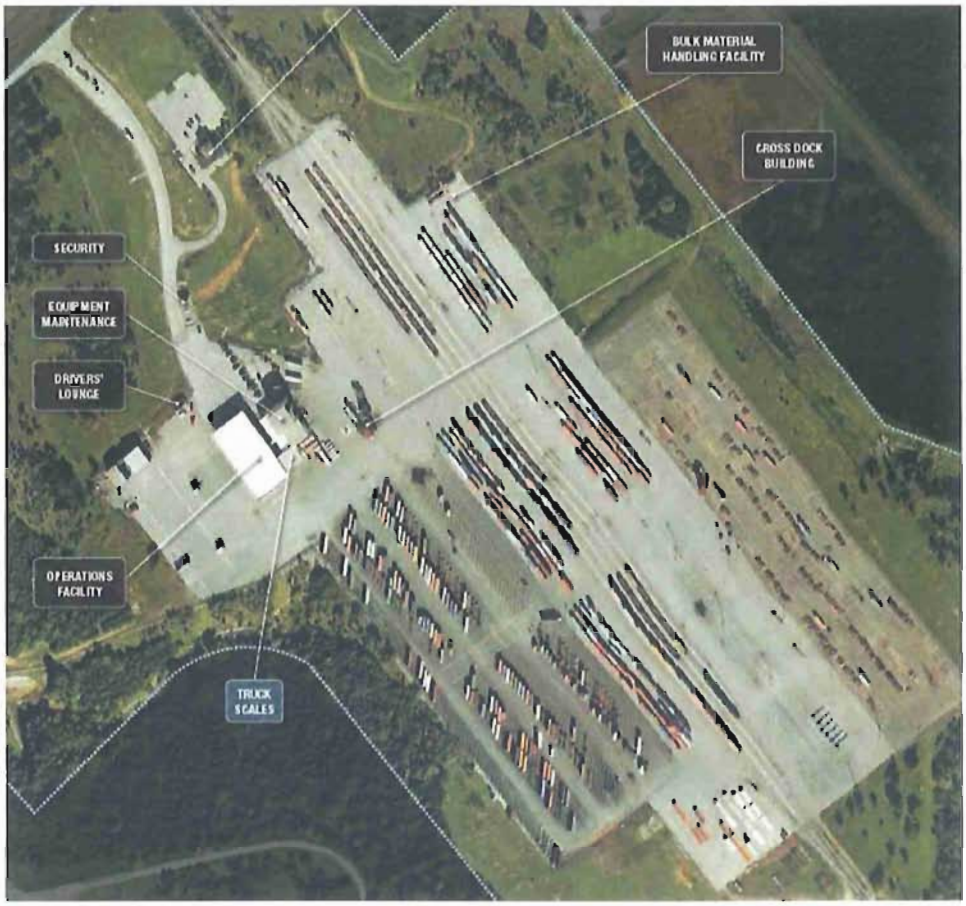


Figure 9: Aerial View of Port of Virginia

The facility contains 17,820 feet of on-site rail serviced by one of the largest railroads in the U.S., Norfolk Southern. The Virginia Inland Port was one of the first inland ports to be designed specifically to remove pressure from a marine port—in this case, the Port of Virginia's Hampton Roads terminal. The extra-urban setting of the Virginia Inland Port has allowed the noise and congestion associated with port traffic to be moved to a setting where there are minimal potential conflicts with other land uses.

Georgia Ports Authority

(http://www.logisticsmgmt.com/article/georgia_ports_authority_moves_forward_with_inland_port_development) announced last year that it will move forward with inland port development. A new inland port agreement signed by Governor Nathan Deal, the Georgia Ports Authority and Cordele Intermodal Services will create and expand international markets for regional business. The agreement will ensure a direct 200-mile rail route to and from GPA's Garden City Terminal in Savannah, which will serve as a gateway to Southwest Georgia and adjacent regions of Florida and Alabama. By reducing the number of truck miles into Savannah, the Cordele operation saves on shipping, reduces highway traffic, and provides new service offerings to benefit shippers, truckers, and steamship lines.

CN's Intermodal Terminal map is shown below.

Figure 70: CN's Intermodal Terminal Map

This map indicates the locations of existing intermodal terminals on the CN network.

CN announced in 2007 that it will build a C$20-million transload centre and intermodal yard in Prince George. Note the similarity between the business plan ***(bold italics)*** of this facility and that of Ashcroft Terminal.

"Prince George, situated 500 miles east of Prince Rupert, is in close proximity to British Columbia's large fibre reserves and other natural resources and is CN's divisional headquarters and main operations hub in northern B.C.

"The Prince George facility is ideally located to tap backhaul export opportunities, filling empty containers moving to Asia via Prince Rupert with lumber, panels, woodpulp and paper, as well as ores, plastics and some metals products. It will help CN maximize revenue potential generated from the new terminal at Prince Rupert, and create new economic and employment opportunities in northern B.C.," says Marshall.

CN's new Prince George transload facility, with an 84,000 square-foot warehouse and 10 acres of outside storage, is expected to open in fall 2007. It will load containers with products arriving at the facility by rail or truck. The loaded containers will then be lifted onto railway flatcars at CN's new adjacent intermodal rail yard, and daily service will be offered from this terminal to the Port of Prince Rupert."

The fully automated intermodal terminal in Calgary opened in 2003 and is co-located with the Calgary Logistics Park at Conrich, AB. The Calgary logistics park offers 170 acres of fully serviced and zoned warehouse distribution sites and has an initial capacity of 3 million square feet of new warehouse space with an additional 200 acres available for future expansion. This new park could offer potential opportunities for transloading of import and export cargo, including forest products cargo.

APPENDIX B – SUMMARY OF INTERVIEWS AND DOCUMENT REFERENCES

Interviews

- Patrick Lo, Canaan
- Jeff Banks, Domtar
- Dennis Bickel, Port Metro Vancouver
- Peter Geldreich, Port Metro Vancouver
- Kleo Landucci, Ashcroft Terminals
- Wayne Robins, WRC Freight Services
- Chris Shubert, Ashcroft Terminals
- Brian Zak, All Forest Solutions
- Jim Charles, Berry & Smith Trucking

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Facility Overvie

The proposed inland facility would have the following capabilities:

a) "Hook and haul" service to mainline rail operators. This means that the facility does not delay the locomotives, and therefore must be able to exchange car strings from full-length intermodal trains in less than one hour. The facility's design, equipment, and staffing must all must enable this level of service.
b) Supporting design - the facility must be secured with fencing and have on-site security enabling storage of international cargo. The facility must have a cargo transfer warehouse that allows transloading from trucks, trains, and shipping containers.
c) Inventory - the facility must effectively manage a range of empty containers and to operate in close coordination with the customers, terminals, and the rest of the supply chain. This implies investment in technology, management staff, and nearly 24-7 operations.

Facility Operation

A typical day at the inland port would involve:

a) Receiving a west-bound train, and cutting a section of cars full of empty containers.
b) Using a local switch engine to connect a prepared string of loaded containers to the same train, and assisting with departing the train.
c) Unloading the empty containers from the disconnected car string, and storing them in an empty yard.
d) Receiving a string of loaded boxcars or other train car with "break-bulk" (non-containerized) forest products.
e) Transloading breakbulk forest products to appropriate empty shipping containers by line and type.
f) Loading full containers to disconnected waiting intermodal cars.

CENTREPORT CANADA

Canada's Centre for Global Trade
WINNIPEG, MANITOBA

Ashcroft Terminal Inland Port Stakeholder Meeting

Dr. David Fung, Director
CentrePort Canada Inc.
June 19, 2014

Global Trends

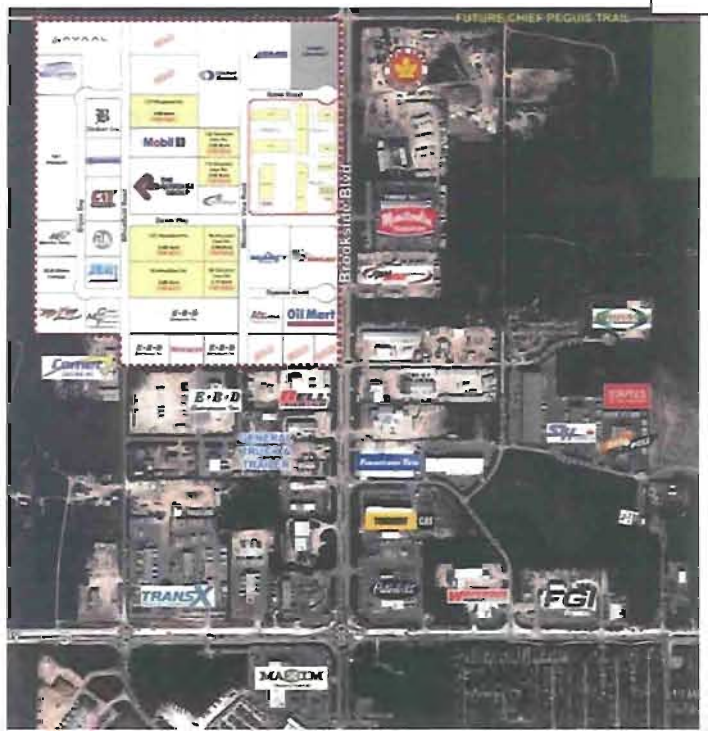
- ✓ Transportation and logistics costs continue to climb.
- ✓ Shift to lower cost transportation modes.
  - Rail is becoming increasingly efficient. The break-even point for rail over truck is now at 1,000 miles and expected to decline to 500 miles.
  - Railways are also speeding up delivery times.
- ✓ Omnichannel – continued implementation of new logistics solutions.
- ✓ Containers are back-hauling.
- ✓ Increased focus on environmental sustainability and efficiency.
- ✓ Near-shoring and re-shoring.

What is an Inland Port?

"A physical site located away from traditional coastal borders with the vision to facilitate and process international trade through strategic investment in multi-modal transportation assets and by promoting value-added services as goods move through the supply chain."

Alliance Texas

CentrePort



(Center for Transportation Research, The University of Texas at Austin)

CENTREPORT CANADA

Canada's Centre for Global Trade
WINNIPEG, MANITOBA

The Five "L"s of Inland Port Development

- ✓ **Location** - Proximity to suppliers and customers.
- ✓ **Land** - Large acreages of certified shovel ready land with necessary infrastructure in place to allow companies to go vertical ASAP.
- ✓ **Logistics** - Sufficient demand for intermodal and manifest rail freight transportation (work with the railroads); local supply of competitive motor carrier services; and air cargo can be an advantage. Many companies manage their supply chains through all three modes.
- ✓ **Labour Pool** - Available, skilled workers still a top attraction factor. Partnerships with post-secondary institutions to support training can be a bonus.
- ✓ **Love** - Basis for successful community relationships; adequate public/private-sector capital to fund development; political, tax and incentive considerations (FTZ?). Does your community support the development?

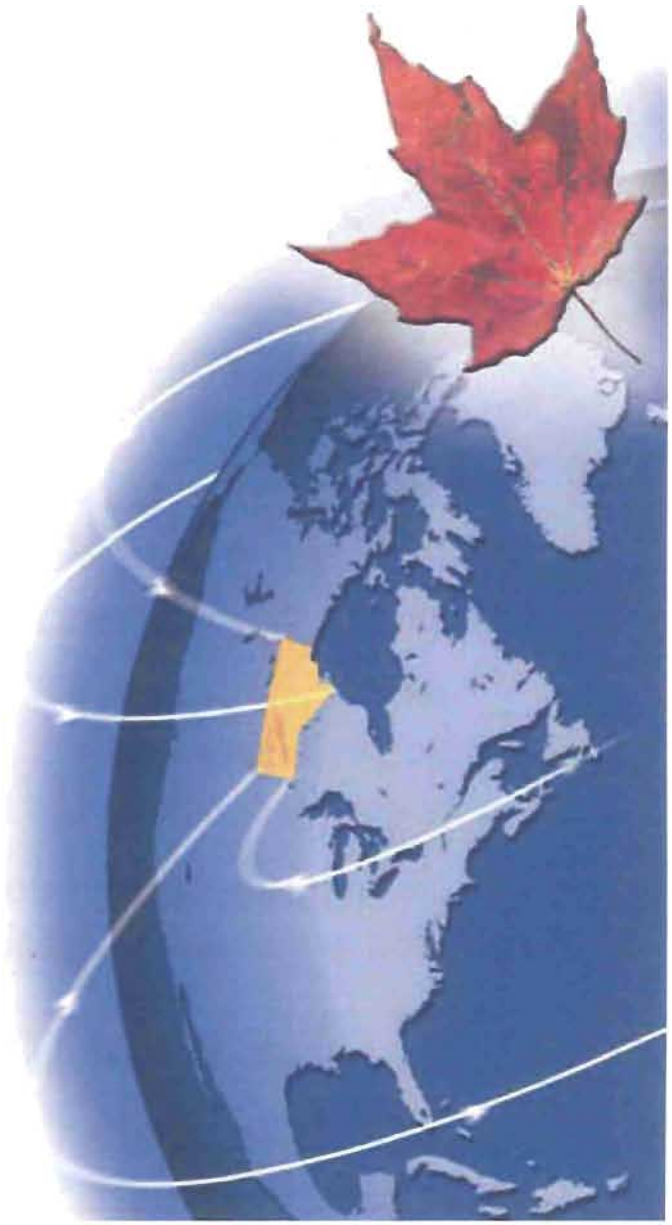
CENTREPORT CANADA

Canada's Centre for Global Trade
WINNIPEG, MANITOBA

CentrePort: Canada's Centre for Global Trade

CentrePort Canada offers **20,000 acres** of high-quality industrial land, adjacent to a major urban centre and the **Canada-US border**, with on-site access to **tri-modal** transportation options. It will incorporate live-work-play components.

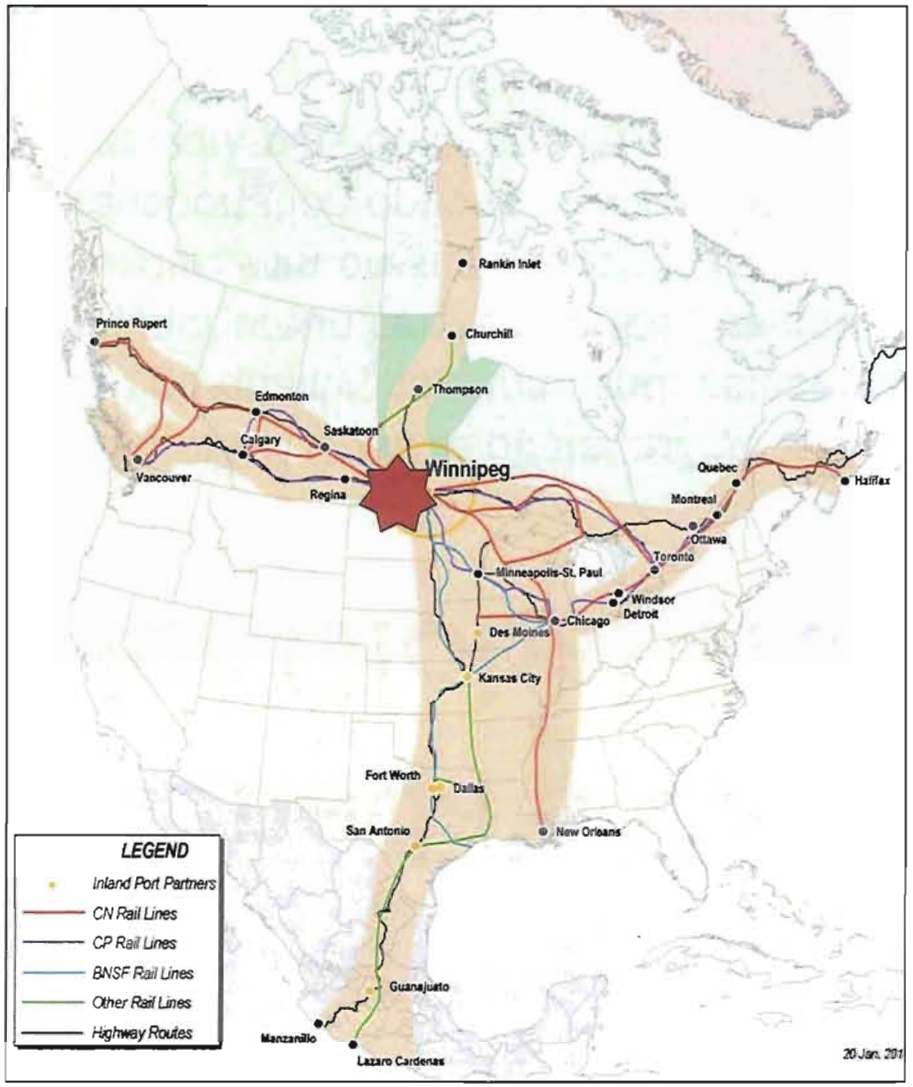
CentrePort Canada Inc. is a business, logistics and development **facilitator**.



CENTREPORT CANADA

Canada's Centre for Global Trade
WINNIPEG, MANITOBA

At the Hub of Key Rail and Highway Corridors



CentrePort Canada is connected to important global markets:

- **Asia Pacific Gateway**
  - Trans Canada Corridor
  - Northwest Corridor
- **Quebec-Ontario Gateway**
  - Trans Canada Corridor
  - Windsor/Detroit
- **NAFTA Gateway**
  - Mid-Continent Corridor
  - Eastern USA Seaboard
  - Mexico
- **Atlantic Gateway**
  - Halifax Port
- **Arctic Gateway**
  - Air Polar Routes
  - Marine Polar Routes4

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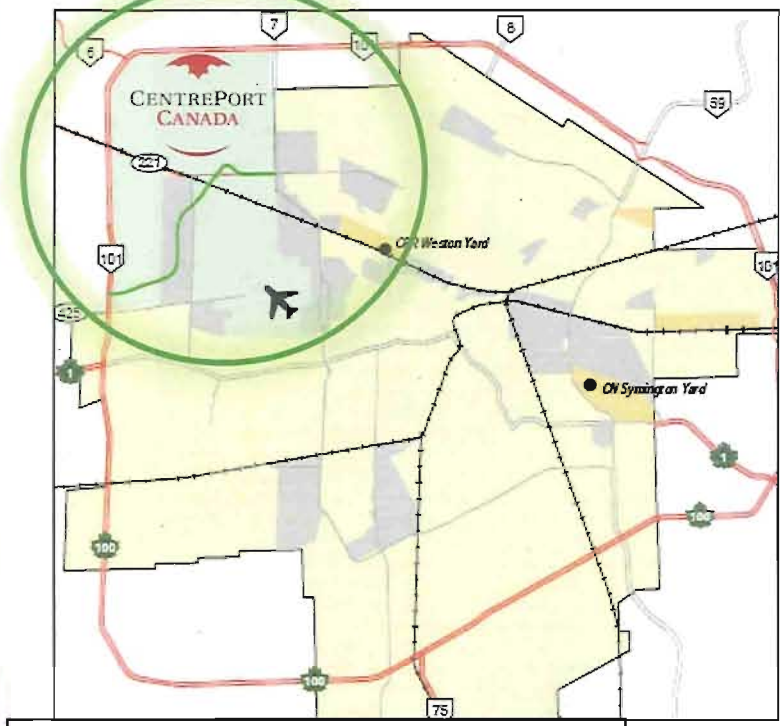
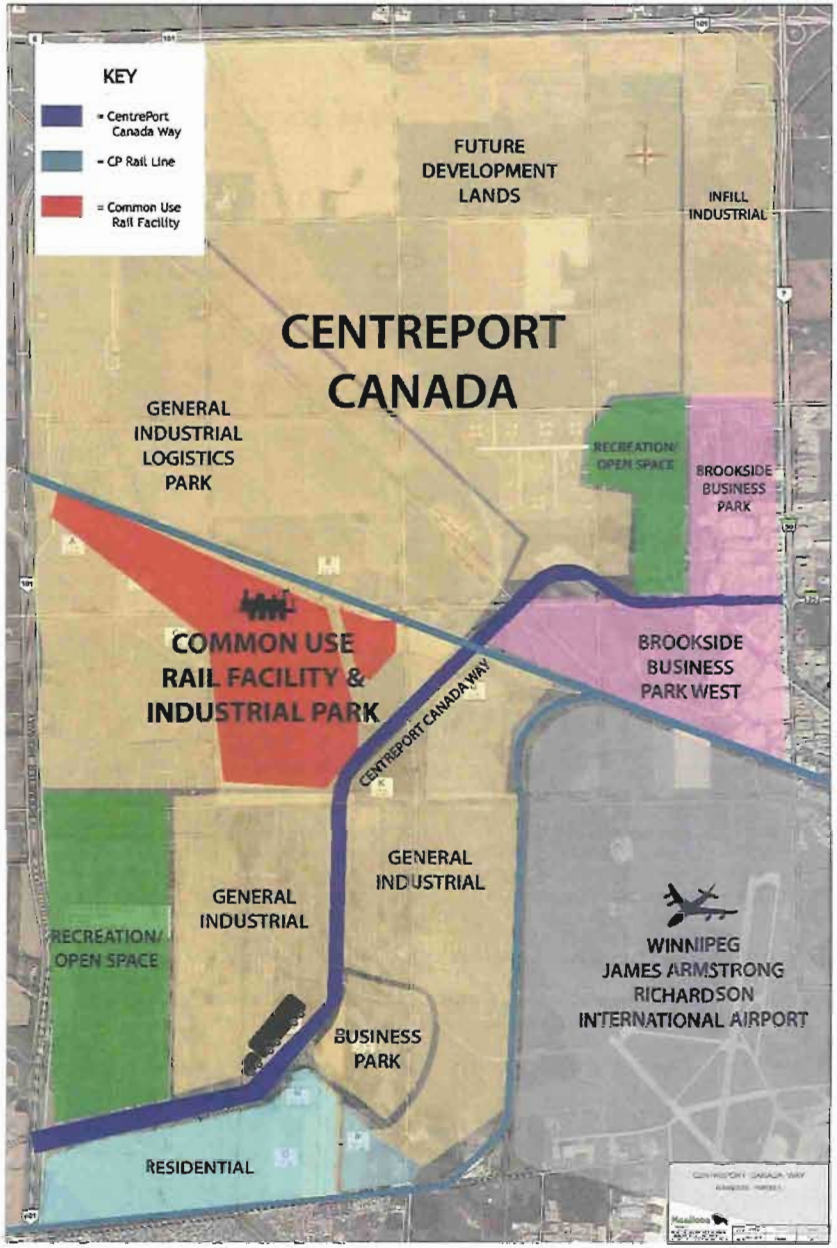
WINNIPEG, MANITOBA

The CentrePort Model



- A private-sector led, non-share capital corporation
- Start-up funding from the Governments of Manitoba and Canada
- By legislation to be self-sustaining over time.
- Collaboration and partnerships with business development agencies, the real estate community and governments.
- Limited land ownership, but focus on development with the private and public sector.



Master Planning Approach to Developing the 20,000 Acre Trimodal Inland Port

Tri-modal Transportation

- Conceptual design work complete for on-site common use rail facility with access to 3 class I railways. Winnipeg is the only Canadian city on the prairies served by 3 class I carriers.

- 70% of Manitoba's trucking industry located at CentrePort. CentrePort Canada Way, a $212.4 million expressway

- James Armstrong Richardson International Airport is #1 in Canada for dedicated freighter aircraft movements and operates 24/7.

The airport has a late (7pm) cut off for overnight parcel delivery to major Canadian / US cities.

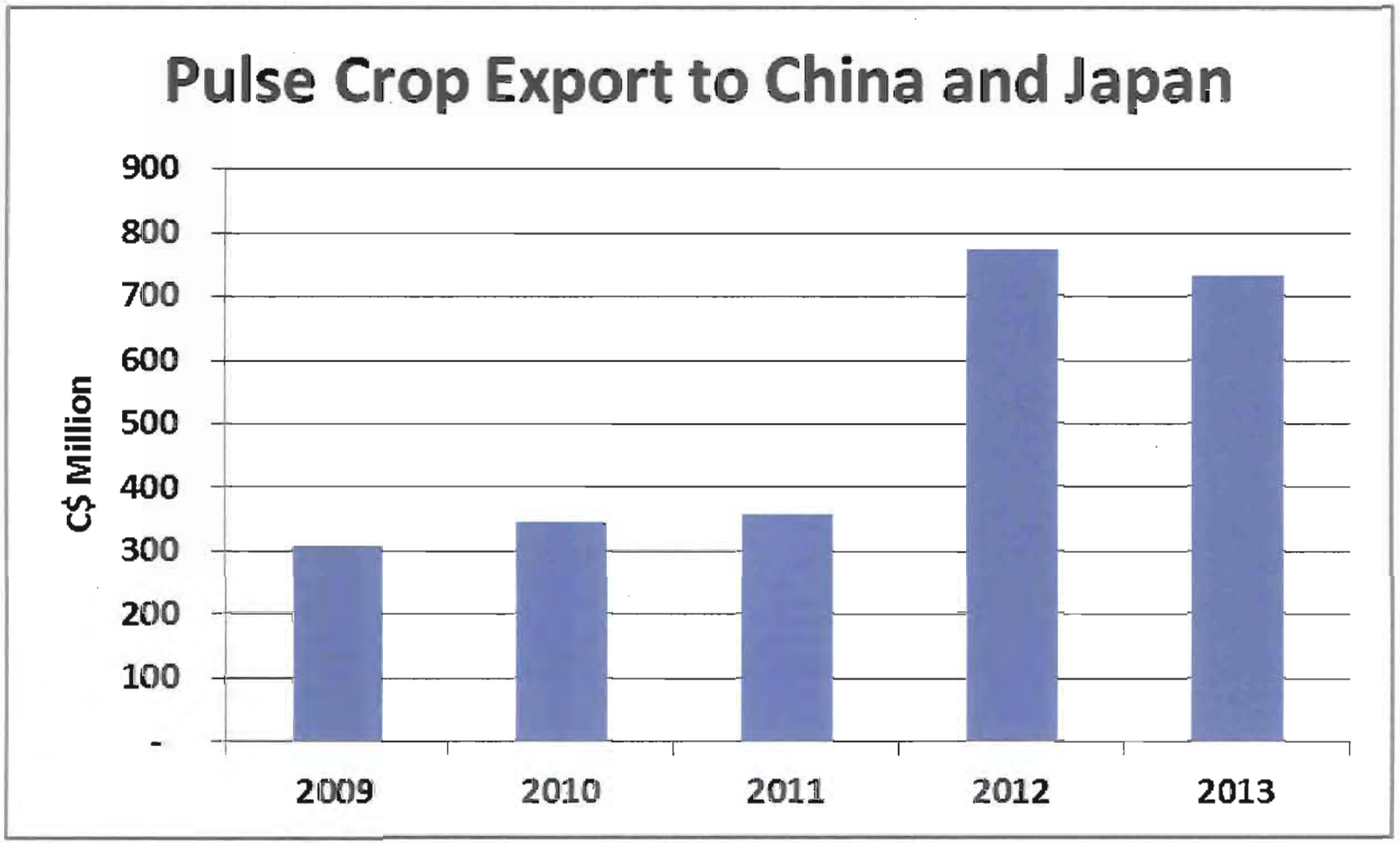
Key Challenges

- Competition from U.S.-based inland ports that offer fiscal/ financial incentives.
- Traditional planning/ legislation doesn't facilitate inland port development
  - The CentrePort footprint crosses multiple jurisdiction, creating a unique planning situation that requires innovative thinking.
- Canada is a large country with a small population base. It is important to understand the business case for your development.
- Co-locating and co-production with multiple rail partners.
- Access to empty containers for the backhaul.

Room for Inland Ports to Grow

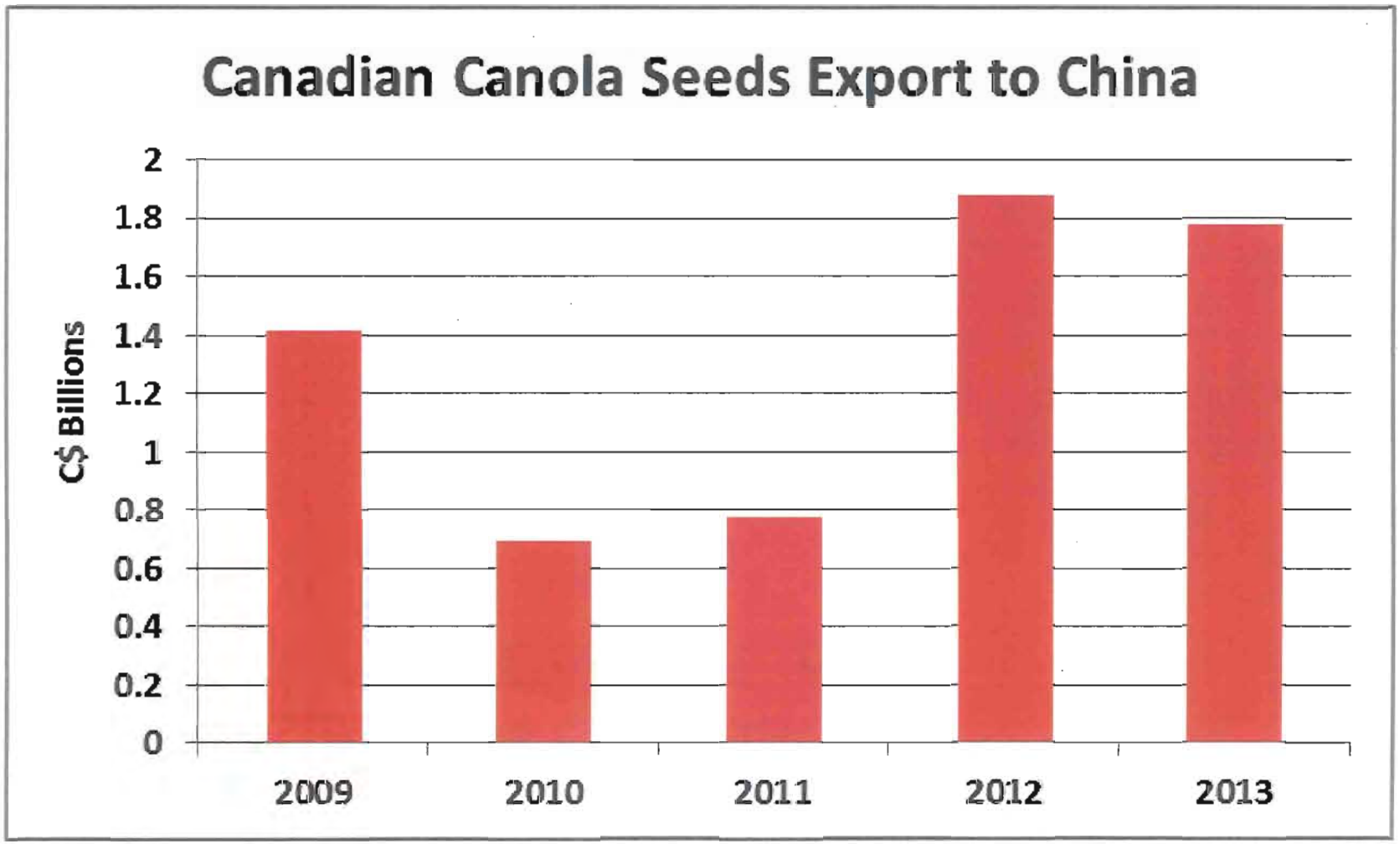
- Demand for large-scale industrial footprints connected to logistics is strong.
- Canada can benefit from the high demand for natural resources globally.
  - Agriculture is in demand more than ever before (exports, food security).
  - Opportunities to ship oil by rail.
  - Product identity preservation containerized shipments.
- Must have a competitive offering. Rail access is essential.

Canadian Pulse Crop Export Growth Opportunity



Source: Statistics Canada

Canadian Canola Seeds Export Growth Opportunity



Source: Statistics Canada

CENTREPORT CANADA

Canada's Centre for Global Trade
WINNIPEG, MANITOBA

CentrePort Canada: Canada's Centre for Global Trade

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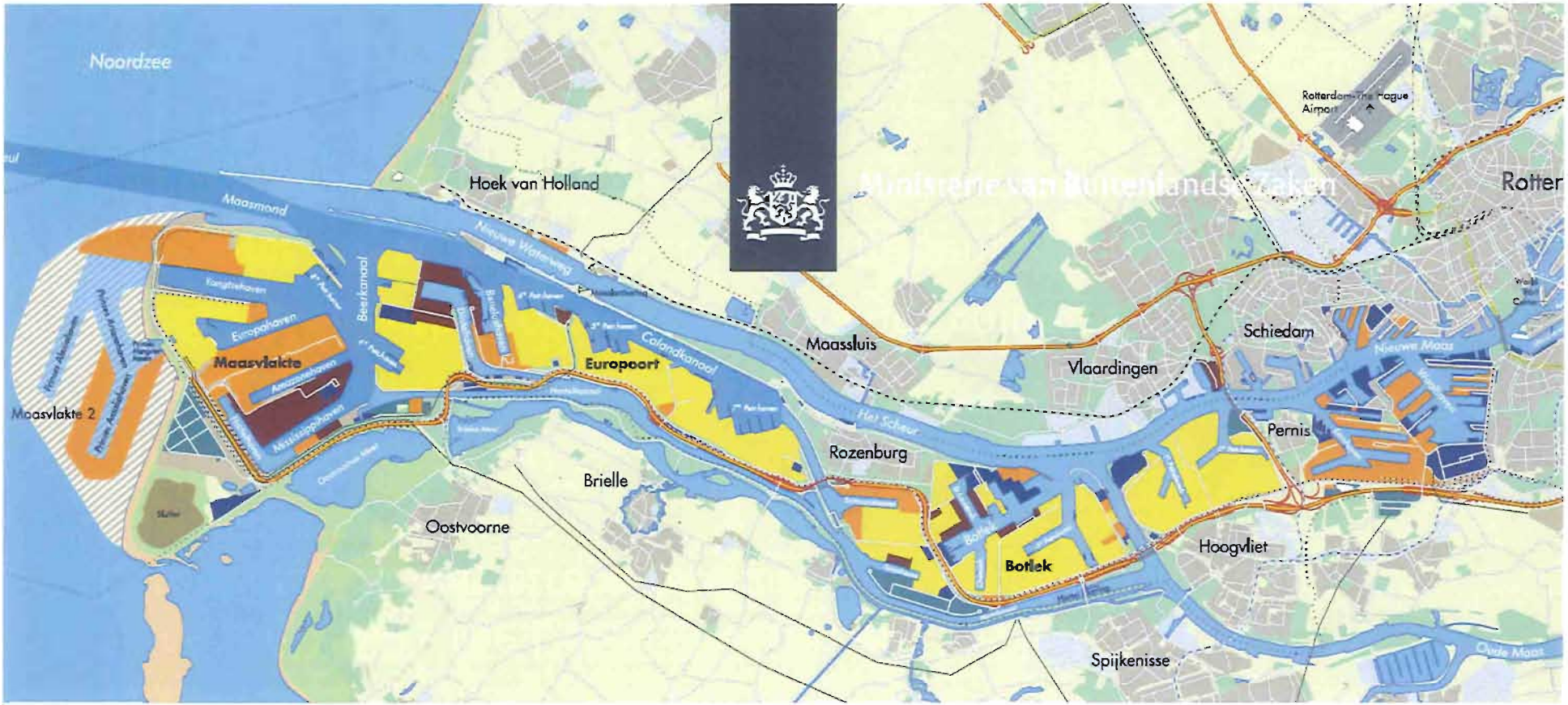


Experiences with inland ports in the Netherlands

Consulate General of the Netherlands, Vancouver

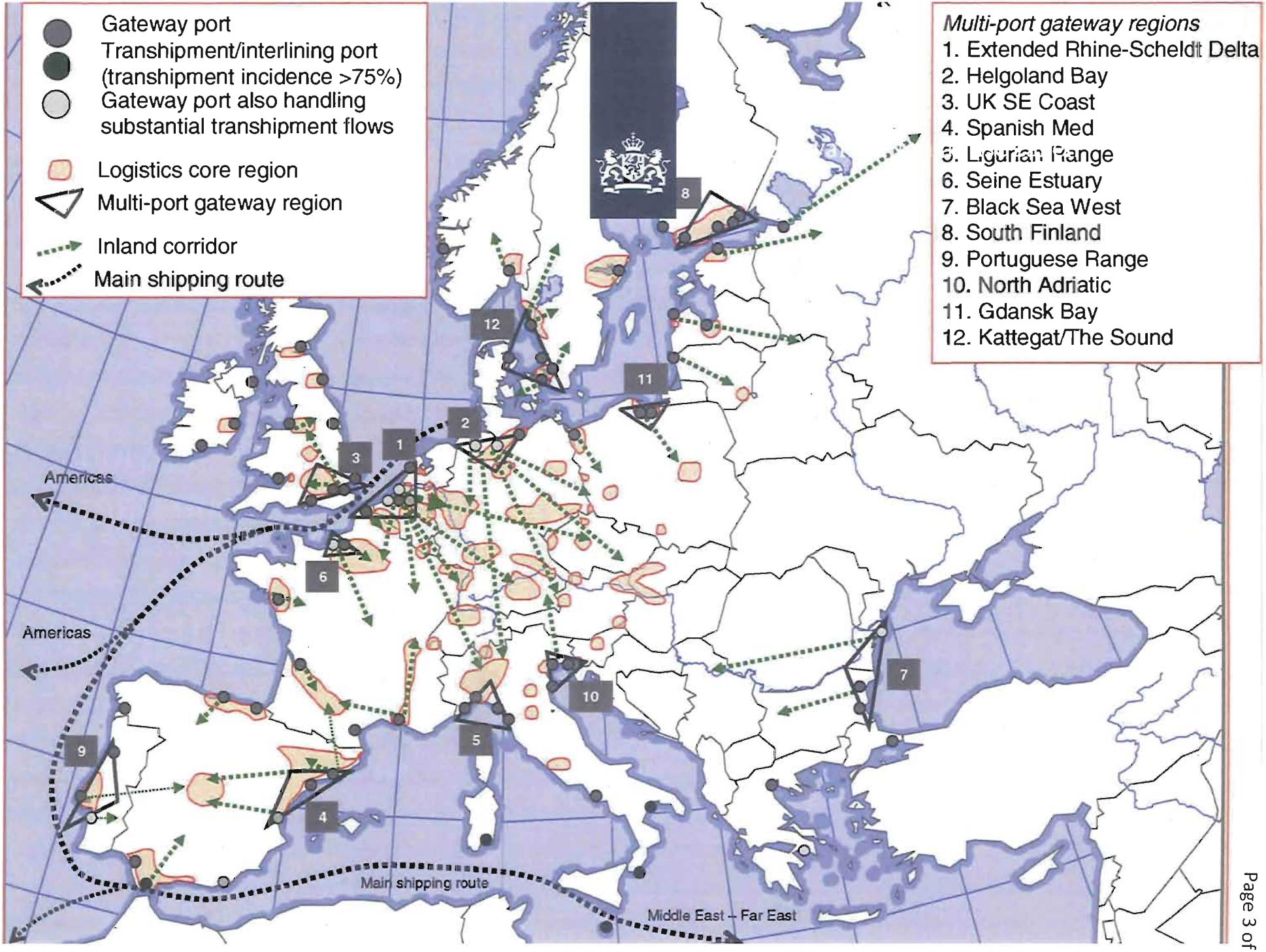
Ministerie van Buitenlandse Zaken

Background: the Netherlands as Gateway to Europe

Since the 1980's the Dutch government has initiated the European Gateway strategy. Many similarities to the Canadian Gateway strategy

This has led to

- Strong growth in cargo and container volumes
- Strong investments in port development and infrastructure
- Long term port planning


Gateway port
Transhipment/interlining port
(transhipment incidence >75%)
Gateway port also handling
substantial transhipment flows
Logistics core region
Multi-port gateway region
Inland corridor
Main shipping route
Multi-port gateway regions
1. Extended Rhine-Scheldt Delta
2. Helgoland Bay
3. UK SE Coast
4. Spanish Med
5. Ligurian Range
6. Seine Estuary
7. Black Sea West
8. South Finland
9. Portuguese Range
10. North Adriatic
11. Gdansk Bay
12. Kattegat/The Sound
Americas
Americas
Main shipping route
Middle East – Far East

Ministerie van Buitenlandse Zaken

Inland ports: the Netherlands - Canada

Differences: geography, population density, long history inland ports

Similarities

- ports are located in congested metropolitan area
- Agricultural lands close to busy port area
- Both regions see strong growth in cargo volumes

Ministerie van Buitenlandse Zaken

Inland ports: the Netherlands

Over the years many different inland terminals in the Netherlands have been set up: many located on waterways, also new rail terminals

- Total employment in inland ports: 66,700 employed
- Total added value CAD $ 19 billion (direct and indirect added value)

Different type of inland terminals

- Hub and spoke location in logistical network: examples like Venlo/Hengelo or Winnipeg/Ashcroft
- Link in production/consumption supply chain: like the German Ruhr area or terminals around Chicago

Figuur 4.1 Binnenlandse intermodale terminals

Barge Terminals
1. Oosterhout
2. Waalwijk
3. Den Bosch
4. Gorinchem
5. Wanssum
6. Nijmegen
7. Utrecht
8. Alkmaar
9. Harderwijk
10. Twente
11. Meppel
12. Groningen
13. Urk
14. West-Friesland
15. Ridderkerk
16. Gennep
17. Helmond
18. Kampen
19. Veghel
20. Bergen op Zoom
21. Roosendaal
22. Breda
23. Ekkersrijt
24. Roermond
25. Nederweert

Rail-Barge Terminals
26. Tilburg
27. Oss
28. Venlo (TCT)
29. Born
30. Stein
31. Moerdijk (v.d. Vlist)
32. Moerdijk (CCT)

Rail Terminals
33. Venlo (Cabooter)
34. Eindhoven
35. Coevorden
36. Veendam
37. Leeuwarden

Maritieme knooppunten
38. Scheldebekken
39. Rijn- en maasmondgebied
40. IJmondgebied
41. Noordelijke zeehavens

Bron: NEA, 2010

Figuur 7.5: Netwerk van extended gates van ECT

Bron: ECT

Ministerie van Buitenlandse Zaken

Trimodal Container terminal Venlo

Trimodal Container Terminal Venlo

Located only a couple of kilometres from the Dutch-German border, the Trimodal Container Terminal Venlo (TCT Venlo) is the perfect inland hub for the Dutch region of Venlo and the German Rhine/Ruhr area. Düsseldorf is a mere 55 kilometres away, Cologne 90 kilometres.

Advantages

Time and again, customers can convey their containers in the most efficient manner possible. Read more

Connections

TCT Venlo has already been the ideal link between the North Sea and the densely populated Rhine/Ruhr area for 25 years. Read more

TCT Venlo

Rail and barge terminal

Total area	8.0 ha
Quay length	155 m
Reefer plugs	18

Equipment

Reach stackers	4
Terminal tractors	2
Container chassis	40
Reefer connections (electric)	12
Barge/stacking crane	1
Rail track	3 x 600 m

Ministerie van Buitenlandse Zaken

Benefits of inland ports

Advantages in general

- best suited to transfer containers fast out of congested seaport
- financial advantages to shipping companies: lower land values of inland terminals offer lower cost transport and warehouses

Advantages for inland ports close to customers

With concepts of "extended gates": the "customs process" is delayed
Shipping companies pay for these services much later.

Ministerie van Buitenlandse Zaken

Benefits for the ports

- Seaports have not lost customers as result of new inland ports

- Inland ports are a strong asset in the region.

In international competition in Europe, shipping companies choose for seaports with well developed network.

Ministerie van Buitenlandse Zaken

Traffic around port area

inland port as tool to reduce congestion

- Strong growth cargo volumes, especially containers
- Strategy to curb congestion: change of modal split
- Inland ports play a role in future

Milion TEU	Port of Rotterdam
1970	0.4
1980	1.9
1990	3.7
2000	6.3
2010	11.1

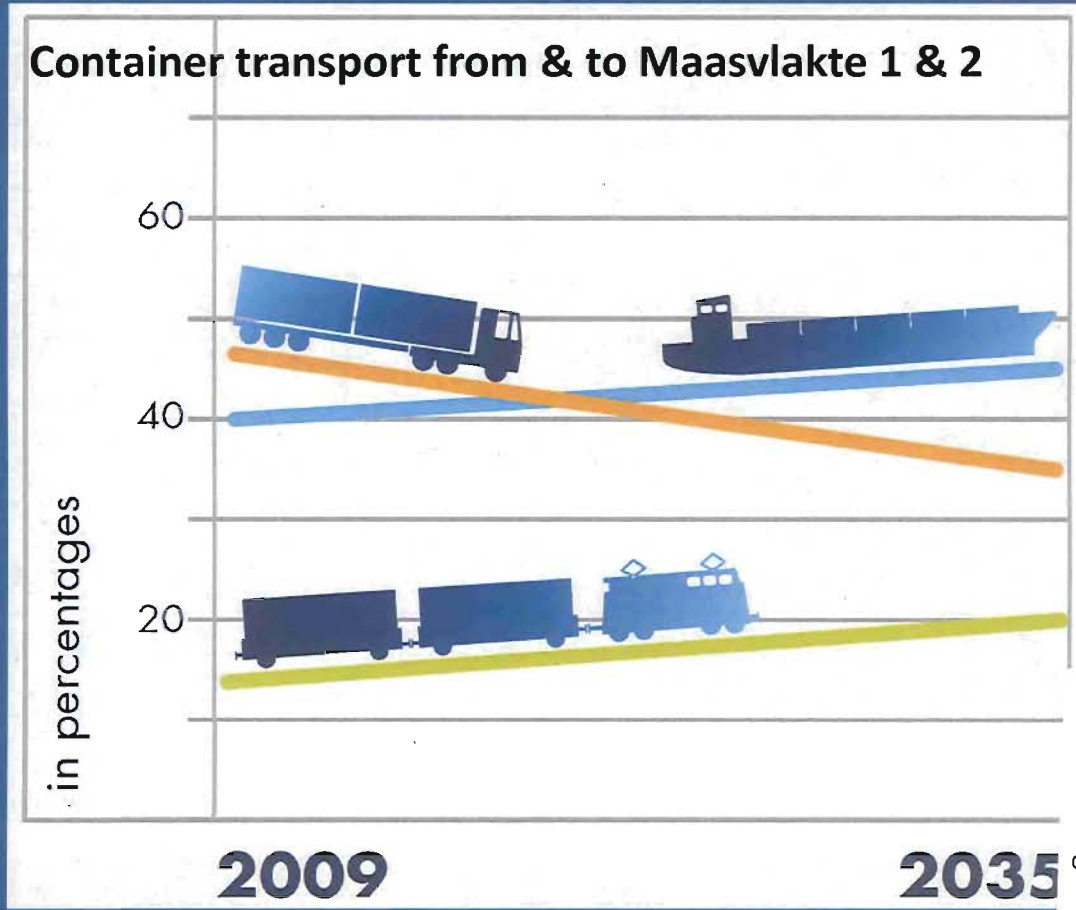
Forecast milion TEU	Port of Rotterdam	Port Metro Vancouver
2010	11.1	2.5
2030	30	7

Ministerie van Buitenlandse Zaken

Port of Rotterdam: Port Vision 2030

The development of so-called transfer centres on the edge of the Rotterdam region will slow down the growth in road transport in the region.

If we are to continue to handle the growing cargo flows, the change in the modal split (more transport by water and rail, less by road) is necessary. The aim for 2030 is a maximum 35% of containers transported to and from the Maasvlakte by road.



Port of Rotterdam Authority, 2011. Port Vision 2030

Ministerie van Buitenlandse Zaken

Job creation

- displacement of jobs in seaport is low, depending on type of inland port
- Added value of jobs is high – indirect benefits for surroundings

Ministerie van Buitenlandse Zaken

Further gateway knowledge and experience

Associations

- Deltalinqs - Inlandlinks
- Connekt
- Dinalog

Educational Institutions: Erasmus Smart Port Rotterdam

- ***Portbase*** – Logistics information platform for private + public businesses;
- ***Keyrail*** – Integrated rail consortium with shuttle services for hinterland transportation;
- ***European Gateway Services*** – Integrated hinterland transportation with inland terminals by ECT.

Deltalinqs | Connekt | DINALOG Dutch Institute for Advanced Logistics

RSM Erasmus University

Over 8 universities and 11 polytechnics with a specialisation in supply chain management.