Inland Terminals

This Facts in Focus policy backgrounder takes a closer look at inland terminals, their potential benefits, factors for success, and opportunities and constraints within the context of goods movement in Metro Vancouver. Like any facet of goods movement and logistics, inland terminals is a complex subject. Inland terminals have been suggested as a solution that could alleviate pressures on the region’s industrial and agricultural lands, and to reduce the number of goods movement-related truck trips. But the viability of new inland terminals in the context of goods movement in the region remains ambiguous.

The Inland Terminals Facts in Focus policy backgrounder is timely given the proposed development of Roberts Bank Terminal 2, the near-completion of the Provincial Gateway Program, the planning for a new bridge to replace the George Massey Tunnel, and the emergence of Ashcroft Terminal as a potential goods movement hub outside the Lower Mainland. It should be read in association with the other policy backgrounders in this series – “Moving Goods through Marine Ports in Metro Vancouver” and “Short Sea Shipping in Metro Vancouver”.

The Greater Vancouver Regional District Board has been consistent in advocating for a more holistic way of balancing the economic interests of the nation and the livability of the region. In the past several years, the Board has taken strong positions for the protection of agricultural lands from conversion to port-based industrial uses, and bringing attention to rising port-related truck traffic through local communities. This and other Facts in Focus policy backgrounders serve to inform local and regional dialogues on issues of regional importance within the context of Metro 2040 – the regional growth strategy.

The Metro Facts in Focus Series is designed to promote a broad understanding of the key issues and opportunities that frame Metro Vancouver’s implementation of the regional growth strategy and its mandate for delivering services and solutions for a livable region.

Metro Vancouver operates under provincial legislation as a regional district and three greater boards to deliver regional services, policy, and political leadership on behalf of 23 local authorities. These local authorities comprise 21 municipalities, one treaty First Nation, and one electoral area. Providing timely research and analysis of regional issues is an important service by Metro Vancouver.
A substantial amount of content in this policy backgrounder was sourced from a technical report commissioned by Metro Vancouver: “Research on the Feasibility of Inland Terminals and Implications for the Efficiency and Environmental Performance of Goods Movement through Metro Vancouver”, prepared by Davies Transportation Consulting Inc. in collaboration with Hooper Engineering, Site Economics Ltd., and Wave Point Consulting Ltd., 2015.
A. What are Inland Terminals?

In simple terms, inland terminals are multimodal terminals located inland from traditional coastal port areas. Inland terminals are also called “dry ports”. A number of facilities exist in the province and region today that function as inland terminals. For the purposes of this policy backgrounder, the focus is on understanding the roles of existing and potential new inland terminals, and some of the implications for Metro Vancouver.

The main benefits that inland terminals can confer to port regions are to:

- Alleviate congestion on marine terminals;
- Influence mode choice from trucks to rail;
- Alleviate pressures on industrial and agricultural lands in the region;
- Extend the reach of marine terminals beyond current catchment areas.

For Metro Vancouver and the Lower Mainland, the most promising application for new inland terminals is containerized goods. Dry and liquid bulk goods are not likely candidates for new inland terminals because existing marine terminals are highly efficient. Also, bulk goods are typically transported via rail already. For goods originating in the province, breakbulk and containerized goods are the only categories of cargo that are amenable to modal shift from truck to rail.

Container movement is forecasted to be a high growth sector, whereas throughput in the breakbulk sector has declined by one-third since 2000. Industrial land demand associated with the growth in container movement through the region will put additional stress on industrial and agricultural lands in the region.
Potential Benefit #1: Improve Efficiency of Marine Terminals

Marine terminal operators are highly motivated to maximize the amount of cargo handled on the terminal. Land utilization is a measure of efficiency. Generally, dry bulk terminals are the most efficient in terms of land utilization. Breakbulk terminals are the least efficient due to the variety of goods handled, specialized handling requirements, and large storage areas required.

Container traffic is the logical priority for the potential use of inland terminals to improve land utilization of marine terminals because efficiency can be improved by shifting non-essential activities to inland locations. For example, empty containers returning by rail from eastern Canada and the U.S. take up space on the marine terminals and generate additional truck trips. Handling these containers at an inland site could free up space at the marine terminals. Table 1 shows land utilization for sample goods and terminal performance in the region.

### TABLE 1: LAND UTILIZATION (DATA COMPILED BY DAVIES TRANSPORTATION CONSULTING INC.)

<table>
<thead>
<tr>
<th>Cargo Type</th>
<th>Sample Commodity</th>
<th>Sample Terminal</th>
<th>2013 Throughput (million tonnes)</th>
<th>Area (ha)</th>
<th>Land Utilization (tonnes/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Bulk</td>
<td>Coal</td>
<td>Westshore Terminals</td>
<td>30.1</td>
<td>40</td>
<td>752,500</td>
</tr>
<tr>
<td>Containers</td>
<td>Containers</td>
<td>Deltaport, Vanterm, Centerm, Fraser Surrey Docks</td>
<td>24.0</td>
<td>145</td>
<td>165,172</td>
</tr>
<tr>
<td>Breakbulk</td>
<td>Pulp, steel</td>
<td>Lynnterm</td>
<td>3.0</td>
<td>59</td>
<td>50,847</td>
</tr>
</tbody>
</table>
Potential Benefit #2: Facilitate Modal Shift to Reduce Air Emissions and Road Congestion
The second potential benefit of inland terminals with direct connections to rail lines is to facilitate a shift in the mode of transport from truck to rail to improve environmental performance and to reduce roadway congestion. The only categories of goods that are amenable to modal shift are containers and breakbulk cargo (see Table 2).

In the case of the fast growing container sector, the anticipated doubling of container handling capacity at Roberts Bank will lead to a concomitant rise in container truck trips. New inland terminals, depending on their function and location in the region or outside, could potentially play a supporting role in diverting some of these truck trips to rail.

Potential Benefit #3: Alleviate Pressures on Industrial and Agricultural Lands in the Region
The region’s industrial land supply is already stretched. The land demand for off-dock container storage, container transloading facilities, and other goods movement-related uses is only expected to rise as container traffic grows. The limited supply of industrial lands for goods movement and non-goods movement creates pressure for conversion of agricultural lands to industrial uses. To the extent that some container handling activity could be shifted to inland terminals outside the Lower Mainland, some commercial pressures on industrial and agricultural lands in the region could be alleviated.

### Table 2. Major Cargo Types
(Source: 2014 Statistics Overview, Port Metro Vancouver; Davies Transportation Consulting Inc.)

<table>
<thead>
<tr>
<th>Cargo Type</th>
<th>2014 Throughput (million tonnes)</th>
<th>Primary Transportation Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>0.4</td>
<td>Rail, truck</td>
</tr>
<tr>
<td>Dry Bulk</td>
<td>89.3</td>
<td>Rail</td>
</tr>
<tr>
<td>Liquid Bulk</td>
<td>8.3</td>
<td>Pipeline</td>
</tr>
<tr>
<td>Breakbulk – excluding logs</td>
<td>8.5</td>
<td>Rail, Truck</td>
</tr>
<tr>
<td>Breakbulk – logs</td>
<td>8.4</td>
<td>Marine, Truck, Rail</td>
</tr>
<tr>
<td>Containers</td>
<td>24.7</td>
<td>Rail, Truck</td>
</tr>
</tbody>
</table>
**Potential Benefit #4: Expand Market Areas for Marine Terminals**

Inland terminals could open up access to new markets. But in the context of goods movement and markets in the province, the development of inland terminals is unlikely to open up new market areas outside existing catchment areas. Port of Prince Rupert and Port Metro Vancouver have fairly defined market shares for off-shore traffic generated on the northern and southern corridors, respectively. New inland terminals are unlikely to result in significant increases in traffic throughput or reallocation of goods movement traffic between these two B.C. port regions. Moreover, a network of inland terminals operates in the province today in the form of rail-truck transload centres handling bulk and breakbulk shipments (primarily breakbulk lumber).

**Did you know?**

**The Goods Movement Chain**

The goods movement chain is a complex process involving buyers, suppliers, and carriers of goods. Carriers — shipping lines, terminal operators, railways, and trucking firms — are motivated to optimize the use of their capital assets (e.g. containers, marine terminals, trains, trucks), minimize opportunity costs, and remain viable businesses in the long-term.

**Shippers:** Shippers are usually the suppliers or owners of the goods being transported via water, land, or air. Shippers may contract third party logistics providers, such as freight forwarders, to manage the transportation logistics, or may contract directly with carriers. Shippers’ choices ultimately determine the commercial viability of transportation services. In general, shippers prefer: lower cost transport alternatives; smaller and more frequent shipments to minimize inventory costs, which can be significant for high value commodities; and, carrier service reliability.

**Shipping Lines:** Shipping lines are companies that provide transportation of goods on marine vessels. Shipping lines typically own their marine vessels and containers. They attempt to maximize utilization of their containers by limiting the amount of time that shippers have for loading and unloading containers before imposing charges.

**Terminal Operators:** Terminal operators attempt to maximize the throughput capacity of their terminals by reducing the time that loaded and empty containers sit idle on the dock. Terminal operators may impose charges for the late pick-up of import containers and the storage of empty containers. Generally, terminal operators are private for-profit entities.

**Railways:** CN and CP run very long trains to achieve economies of scale (e.g. 3,600 metres). The operational objectives are to maintain fluidity and equipment balance. Maintaining fluidity means minimizing dwell times between marine terminals and major destination/origin points in eastern Canada and the United States (marine terminals). Equipment balance refers to the avoidance of moving empty equipment. The ideal operation is to run fully-loaded trains eastbound and westbound.

**Trucking Firms:** Trucks are integral components of the goods movement chain, whether they are moving commodities for import or export, or making local deliveries. Trucking providers want to optimize their assets — the truck — by minimizing travel time and distances travelled, fuel consumption, and the number of trips with an empty chassis (“empty leg trips”).
B. Current Inland Terminals

A number of facilities function as inland terminals in the province today, servicing non-containerized and containerized goods.

**Non-Containerized Goods**

Lumber reload facilities function as inland terminals to allow mills without direct rail service to access the rail network, and to obtain better shipping rates and service through competing truck and rail operators. Reload facilities allow for truck-rail, truck-truck, and rail-truck transloading activities. For example, lumber from a mill may be hauled by trucks to a reload facility in the Fraser Valley. From there, the lumber is typically reloaded to a rail car for shipment to US destinations, or transloaded into a marine container for delivery to the deepsea terminals for export to offshore markets.

**Containerized Goods**

The first inland terminal in the province to handle container traffic is Canadian National Railway’s (CN) Prince George Intermodal Terminal and Distribution Centre, located 720 km east of Prince Rupert. The inland terminal opened in 2007 to facilitate containerized exports through the Port of Prince Rupert. CN invested $20 million to construct the Prince George terminal on lands leased to CN as part of the overall BC Rail transaction in 2004. Empty containers returning from the U.S. and eastern Canada are filled with export commodities (primarily pulp, paper, and lumber), transported by rail to Prince Rupert, and exported to Asia by ship. CN provides direct daily rail service to the Port of Prince Rupert.

In 2012, the terminal was handling about 700 to 800 containers per week. The success of the terminal can be attributed to the high concentration of forest product plants in close proximity to Prince George, including three pulp mills, and connections to Highways 16 and 97. The long distance to Prince Rupert (700 km) makes trucking a relatively higher cost transportation mode on this corridor.
Did you know?

Development of Lumber Reload Facilities

Beginning in the 1980’s, a network of lumber reload facilities was established to handle lumber exports from B.C. mills. Two major factors drove this development. First, for mills that lost rail service due to rail line abandonments, access to the main railway network was maintained by trucking products to reload facilities. Second, for mills located on a single railway, trucking to a reload facility located on another railway provided a competitive option to keep rail rates low. Reload facilities were established in the B.C. Interior, the Lower Mainland, and adjacent to the Canada-U.S. border.

One of the first lumber reload facilities was the Westran facility on Braid Street in New Westminster constructed in 1983. Vancouver-based Arrow Reload Systems currently operates four lumber reload facilities in B.C. at Christina Lake (West Kootenay), Kamloops, Chilliwack, and Port Coquitlam; and, three bulk transload facilities in Ashcroft, Sparwood, and Nelson.

The reload facilities also benefitted from changes in transportation technology and policy. In 1987, an interprovincial agreement resulted in authorization of new heavy truck configurations, including ‘Super B train’ trucks, which made trucking heavy commodities over long distances very cost-competitive. The availability of competitive trucking options allowed shippers to negotiate lower rates with the railways.
Case Study 1: Ashcroft Terminal (Ashcroft, British Columbia)

Established in 1999, the 130-hectare (320-acre) Ashcroft Terminal provides rail car storage, materials handling, transloading, and other logistics services for companies in the agricultural, forestry, mining, oil and gas sectors. This inland terminal is located 340 km east of Metro Vancouver with access to Highways 1 and 5.

All rail traffic on the CN and Canadian Pacific Railway (CP) mainlines into or out of the Lower Mainland passes by the Ashcroft Terminal. In March 2014, Ashcroft Terminal, with federal funding, added a 1,500-metre enhanced connection to the CP mainline with additional rail car storage, transload facilities, and support tracks. The terminal’s total trackage is now over 10,000 metres, allowing the terminal the capacity to handle long trains and switching.

Following completion of the rail connection project, Ashcroft Terminal entered into an agreement with Richmond-based Canaan Group to initiate a container program in Q2 2015. The program will start with repositioning empty containers from major shipping lines for transloading of forestry products for export markets. Canaan’s longer term vision is to attract import container traffic.
Case Study 2: South Carolina Inland Port (Greer, South Carolina)

The South Carolina Inland Port (SCIP) in Greer, South Carolina opened in 2013 to facilitate containerized goods traffic to and from the Port of Charleston. The SCIP is located 341 kilometres inland from the Port of Charleston. The two ports are connected by a Norfolk Southern mainline.

The SCIP is a 16-hectare (40-acre) site located strategically halfway between Atlanta and Charlotte – two of the largest metropolitan areas in the southern United States (about 94 million consumers are within a day’s drive from Greer). Imports of auto parts for the nearby BMW plant make up about one-half of throughput, thus ensuring there is sufficient business for the rail provider to run trains regularly.

The SCIP allows modal shift from trucks to rail. The SCIP can receive export containers from regional industries via truck or rail, then transfer to the main rail line to the Port of Charleston. Import containers are placed on the same rail line from Charleston to SCIP. The Greer port also holds empty containers – regional shippers can send trucks to Greer for empty containers.

The SCIP was developed by the South Carolina Ports Authority and constructed over nine months for $50 million. The port is on track to handle 60,000 containers in fiscal year 2014/15 (50 percent ahead of the original target of 40,000 containers). The plan is to increase container throughput to 100,000 by 2018.
C. Three Potential Inland Container Terminal Services

Inland container terminals could provide three basic services. Depending on the scale of operations and market demand, any inland terminal could provide one or more of these services. The financial feasibility of inland terminals to serve container traffic is a paramount criterion for prospective operators. The decisions of shippers and rail carriers – they have to see financial benefits – determine the feasibility of inland terminals.

Potential Container Terminal Service #1: Import Handling
In this application, loaded import containers are transferred from the vessels at marine terminals and taken directly via rail to the inland container terminal for processing and further shipment by truck or rail. The inland container terminal could be located within the Lower Mainland or further inland.
Challenges:
A major constraint to this application is that an inland container terminal introduces an additional handling step in the goods movement chain that may add time and cost to the supply chain. Other region-specific challenges are:

- The high cost and limited availability of suitable industrial land within the region for construction of a terminal of a suitable size;
- The geographic separation of the four marine container terminals (Vanterm, Centerm, Deltaport, and Fraser Surrey Docks) is problematic for rail providers to develop competitive short haul rail service to an inland container terminal;
- Competing with the established system of import distribution/transloading facilities that handle containers coming off the marine terminals (an out-of-region inland container terminal would face the difficulty of having to establish a new cluster of proximate import facilities to handle sorting and reloading activities in order to achieve economies of scale);
- Currently, about two out of three loaded import containers arriving in the region are loaded directly onto trains destined for eastern Canada or the U.S., effectively nullifying the need for an inland container terminal to undertake import handling activities.

Did you know?

**Distribution of Import Containers**
In 2009, most loaded import containers were moved by rail in Metro Vancouver. For every 100 loaded import containers arriving at marine terminals, 63 were immediately sent to eastern Canada and the U.S. by rail, either directly in unit trains or via the CN and CP intermodal yards (2 additional containers were trucked to intermodal yards and transferred to rail). Of the remaining 35 containers, 10 were trucked directly to western Canada or U.S. destinations, and 25 were trucked to import transload facilities for sorting and reloading, then either transferred to rail for eastern Canada and the U.S., or trucked to final destinations in BC and other Canadian destinations.

One of the reasons why marine containers are taken to import transload facilities is to transfer the contents to larger domestic containers. A standard 40-feet marine container has a volume of 2,350 cubic feet, compared to 3,857 cubic feet for a 53-feet domestic container. The contents of three marine containers can fit into two domestic containers, thereby reducing the number of trucks or rail cars required to move the same amount of goods.
Potential Container Terminal Service #2: Export Handling

An out-of-region inland container terminal could be viable as it would not necessarily introduce an additional step in the container handling chain, but rather change the location of the container loading and handling activities. The rapid rise in the containerization of forest products (lumber and pulp) from the southern interior of B.C. could potentially support the siting of an inland container terminal. In this scenario, the role of the inland container terminal would be to receive the forest products by truck or rail from the mill, load the products into empty containers, and have them transported via rail to a marine terminal. Alternatively, the container stuffing can occur at the mill (shown in the graphic). Some long-haul truck trips loaded with forest products that would otherwise make the journey to Metro Vancouver export distribution facilities could therefore be avoided.
**Challenges:**

This application has challenges, however. First, empty marine containers must be sourced from westbound trains returning from eastern Canada and the United States. Rail service providers generally want to avoid mid-journey stops for operational efficiency reasons. Second, the cost for shippers to use the inland terminal option will have to be competitive with the current practice.

**Did you know?**

**Sourcing Empty Containers for Export Stuffing**

There are two sources of empty containers for export shippers:

- The first source is import marine containers unloaded within the region.
- The second source is empty marine containers returning from eastern Canada and the U.S. Empty containers are carried by rail directly to the marine terminals.

In both these cases, the empty marine container can be stored on the marine terminal (subject to allowable space and dwell time charges), trucked directly to an export transload facility for stuffing, or trucked to a dedicated empty container storage site. When empty containers have to be trucked to a dedicated empty container storage site, an “empty leg” truck trip may be created — after unloading the container, the truck leaves empty. These extra truck trips contribute to unnecessary congestion on the region’s major roads and generate noise and air emissions.
Potential Container Terminal Service #3: Empty Container Storage

An inland terminal serving to store empty marine containers from import transload facilities and from empty containers returning from eastern Canada and the U.S. could potentially free up space on marine terminals, eliminate many unnecessary truck trips, and reduce costs in the goods movement chain. The empty containers could then be transported by rail or trucks to export transload facilities nearby or on-site. The loaded export containers would then be transported by rail to a marine terminal. In order to be competitive, an inland terminal would need to be in close proximity to import and export container handling facilities to maintain container truck movement efficiency.

Challenges:

Logistics operations in the region have adapted to off-dock empty container storage by implementing a variety of strategies to increase “triangulation” of truck trips – the direct transfer of containers between import and export facilities without the need for intermediate storage. Both import and export transload facility operators have invested in container-handling equipment to store and stack empty containers on-site.
Did you know?

The Empty Container Gap

When the contents of import containers are unloaded in the region, the resultant empty containers can be repositioned for export stuffing. Historically, an insufficient number of import containers unloaded in the region has forced export shippers to rely on empty containers returning from eastern Canada and the U.S. to fill the “empty container gap”.

In 2005, the empty container gap was 140,000 TEU per year. The industry forecast at the time indicated the gap would decrease to 80,000 TEU per year by 2011. This pattern suggested an ever increasing supply of empty containers left in the region that could be repositioned for export stuffing. The underlying demand for the services of an empty container terminal appeared to be weak.

However, import container throughput dropped abruptly during the global economic recession in 2008-2009. The growth rate has since rebounded to track very similarly to that of export containers. The new trend suggests that the empty container gap will expand to at least 400,000 TEU per year by 2020. The revised forecast suggests that the underlying demand for an empty container inland terminal exists. The question is whether a financially viable terminal of a suitable scale could be developed. Regardless, the forecast also implies that truck trips for repositioning empty containers will continue to grow.

FIGURE 7: EMPTY CONTAINER GAP ACTUAL AND FORECAST
DATA COMPILRED BY DAVIES TRANSPORTATION CONSULTING INC
### D. Key Findings and Considerations

The prospects for new inland container terminals in the province that will materially affect goods movement in Metro Vancouver are interlined with opportunities and constraints.

#### POTENTIAL OPPORTUNITIES

| **Export Containers:** Inland terminals could play a role in the handling of export containers. The predominant commodity carried would be wood and pulp products from B.C. mills for export to international markets. |
| **Empty Container Handling:** Given the revised outlook for a large “empty container gap”, an inland terminal could play the role of intercepting empty containers returning from eastern Canada and the U.S. and transferring them for export stuffing. |
| **Cost of Logistics:** The limited supply of industrial lands coupled with increasing container traffic will push up the cost of container logistics in the region. At a certain point, businesses may find it no longer viable to expand operations within the region, or to locate in the region. An inland container terminal located outside the region or Lower Mainland may provide a lower cost alternative to moving goods and doing business. |

#### POTENTIAL CHALLENGES

| **Industrial Land Supply:** Finding vacant or underutilized industrial lands for an inland container terminal in the region will be challenging. The Tsawwassen Gateway Logistics Centre has the potential to become such a terminal. Beyond the Lower Mainland, the Ashcroft Terminal, with 130 hectares of industrially-zoned lands, has the potential to alleviate some industrial land pressures in Metro Vancouver. |
| **Rail Line Connections:** For new inland container terminals to work, the major railway companies must be willing to provide direct mainline connections. For that to happen, the railways must see a terminal that minimizes train dwell time, and that will draw sufficient and consistent loads. |
| **Competitiveness with other Transportation Options:** A new inland container terminal must demonstrate that it will lead to improved efficiencies and higher financial returns for the relevant supply chain participants in comparison to the existing system of logistics. |
| **Supply Chain Needs:** A new inland container terminal outside Metro Vancouver will need to establish a critical mass of activity before a significant level of container activity can be shifted from marine terminals in the region. Competing with the established system of import and export transload facilities in Metro Vancouver is a huge barrier for the development of new inland terminal options. Even if the cost of logistics in the region increases and forces current and new businesses to consider locating in other places, there is no guarantee as to where these businesses may choose to locate – within the province or beyond (e.g. Seattle, Calgary). |
Existing and new industrial developments in Metro Vancouver reflect the fervour to serve import and export container traffic growth.

The 281-hectare (694-acre) Richmond Logistics Centre co-locates import and export transload facilities to enhance business efficiencies and to reduce the number and distances of truck trips. The site incorporates major import transload operations (HBC Logistics, Container World); export transload operations (Coast 2000, Westrans, Eura Asia, Lulu Island Terminal); and, empty container storage (Coast 2000). Import facilities receive loaded import containers by truck from the marine terminals. The export facilities receive lumber and pulp in rail cars via a CN rail line (CN does not provide container service to the site). The empty containers coming out of an import facility can be transferred directly to a nearby export facility. Space is available for the storage of empty containers to act as a buffer.

The new Queensborough Logistics Centre in New Westminster will provide 55,000 m² (590,000 sq.ft.) of building space for industrial and logistics uses. The first of three buildings was completed in 2013 for Damco for import container handling.

The new Boundary Bay Industrial Park in Delta will provide 81,000 m² (870,000 sq.ft.) of building space for container handling activities. The first building was completed in 2014; the second building began construction in Q1 2015 for completion in Q4 2015. The industrial park is located within 10 minutes of Deltaport.

The Tsawwassen Gateway Logistics Centre is a 135-hectare (330-acre) site located adjacent to Deltaport with direct highway and rail access. Three projects were announced in 2014: development of 112,000 m² (1.2 million sq.ft.) of container warehouse facilities, a federally-funded marine container examination facility, and a truck fueling station.
E. Towards a Regional Dialogue

Inland container terminals could potentially be one element within a bundle of solutions to better manage truck traffic within Metro Vancouver and to alleviate pressures on industrial and agricultural lands. Other solutions may be possible and effective, such as expanding short sea shipping, improving operational policies, and optimizing logistics land use development. A more integrated dialogue is needed – one that takes a systems perspective of solutions and effects, and promotes data and knowledge sharing.

Taking a Systems View of Solutions and Effects

By looking at overall systems, rather than looking at one component at a time, more integrated and effective solutions may be identified. These solutions could be prioritized based on environmental performance, regional land use and transportation objectives, cost-effectiveness, capital costs, and acceptability by local governments and industry.

For example, a 2013 Corporation of Delta study analyzed the transportation outcomes of an export-oriented container terminal in the Ashcroft/Kamloops area. The study showed that at a base throughput of 95,000 TEU (56,000 containers) per year by 2031, the inland container terminal could potentially eliminate 192,000 container truck trips annually within Metro Vancouver (and an additional 26,000 non-containerized truck trips). For context, the reduction in container truck trips represents 10% of the external 1.9 million container truck trips expected to be generated on Roberts Bank at maximum throughput in 2031. About 9,500 tonnes of greenhouse gas emissions per year could be avoided in this scenario.

A study commissioned by Port Metro Vancouver in 2012 analyzed potential strategies to manage the container truck traffic forecasted to be generated by Deltaport and the proposed Roberts Bank Terminal 2. The study findings suggest that regional and terminal-specific operational and land use development could potentially be effective strategies.

<table>
<thead>
<tr>
<th>STRATEGY TESTED</th>
<th>ACTIONS</th>
<th>TRANSPORTATION MODELLING OUTCOME</th>
</tr>
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</table>
| Maximize Operational Efficiency| • Increase the number of double-ended truck moves (trucks pulling loaded chassis in both directions) from the current 63% to 80%  
• Increase gate operations to 300 days a year from the current 260 days a year  
• Improve the utilization of available gate hours (14.5 hours a day) to encourage spreading of the peak | Overall Roberts Bank truck and non-truck traffic reduced by 36% during commute peak hours from 2031 baseline. |
| Optimize Logistics Land Use Development | • Enhance the role of the Tsawwassen First Nation Gateway Logistics Centre to intercept westbound empty containers and to handle export stuffing functions  
• Increase container logistics development along the South Fraser Perimeter Road, thereby reducing the number of truck trips that would have to cross the Fraser River (although the Richmond Logistics Centre will remain a major traffic attractor) | Overall Roberts Bank truck and non-truck traffic reduced by 19% during commute peak hours from 2031 baseline. |
Did you know?

Performance-Based Planning

Most public and private sector plans set out performance targets to be achieved or surpassed. In regional transportation planning, TransLink, for example, has set an ambitious target to realize a majority of trips taken by residents to be on transit, walking, or cycling by 2040. The purpose of setting this and other targets is to ensure that the many actions undertaken by TransLink – transit planning and investment, land use coordination with local governments, maintenance of the major road network – are harmoniously tied to the same objectives, that these objectives are communicated to partners and influence partner actions, and that resources are put into monitoring for trends.

The goods movement sector provides an opportunity to extend this performance-based planning model. The Port of Rotterdam – a government corporation jointly owned by the City of Rotterdam and the Netherlands – realizes that as the port expands to meet growing cargo flows, a change in modal split is necessary to maintain sustainability. The Port established a 2030 target to have a maximum of 35% of container throughput transported by trucks, 45% by barge, and 20% by rail. In 2009, the mode splits were 47.5% by truck, 39% by barge, and 13.5% by rail. The policy targets are implemented through concession contracts with container terminal operators. While still early, current research suggests that terminal operators have since become motivated to examine different terminal designs that promote rail and barge services, and to take on a network perspective to connect marine terminals with inland terminals via road, rail, and inland waterway transportation options.
Enhancing Data Sharing and Knowledge Base

The lack of regional data sharing and a fragmented knowledge base from prior goods movement research hinder a productive regional dialogue. When decisions on policies and investments are based on incomplete or deficient information, the region’s performance can suffer as a result.

Data from existing sources are often not shared for broader public research and policy efforts for fear of losing competitive advantages and other reasons. The lack of data sharing hinders efforts to find win-win solutions among different stakeholders. If existing data could be more widely shared, policies and investments may be better informed. Also, the real gaps in data would be revealed and resources can be effectively put to filling in these gaps.

The knowledge base on regional goods movement is fragmented with out-of-date and incomplete information. As noted earlier, the outlook for the empty container gap has changed. The distributional pattern of import containers was derived from a 2009 survey and should be updated. Also, transportation costs may have changed substantially with a new trucking agreement and changing rail tariffs, perhaps affecting the prospects for new inland container terminals (and expanded short sea shipping).

The limited number of studies on inland container terminals point, short sea shipping, and other actions points to a significant opportunity to review the goods movement system in a more holistic way, including the feasibility of specific actions and the effects on a range of accounts (i.e., economic, environmental, social, human health). Moving forward, efforts towards greater collaboration between industry, senior governments, and local governments are needed in the area of data sharing and knowledge base enhancement. Some possible collaborative actions are to:

- Establish a baseline and monitor productivity for the container trucking sector using Port Metro Vancouver’s GPS data and other supplemental data, to share this information widely;
- Undertake a comprehensive investigation – using updated data – of the commercial viability and effectiveness of operational improvements, inland container terminals, short sea shipping, and import/export facility co-location, and other promising measures; and
- Establish a research, education, and policy forum between Metro Vancouver (on behalf of member local governments), TransLink, Port Metro Vancouver, and senior governments, and academia.
References


“4 Industrial Projects to Watch This Year”, Bisnow, February 9, 2015.

“An Exploratory Analysis of the Effects of Modal Split Obligations in Terminal Concession Contracts”,
Roy van den Berg (Port of Rotterdam Authority) and Peter W. De Langen (Eindhoven University of Technology), 2014.


“Research on the Feasibility of Inland Terminals and Implications for the Efficiency and Environmental Performance of Goods Movement through Metro Vancouver”, prepared for Metro Vancouver by Davies Transportation Consulting Inc. in collaboration with Hooper Engineering, Site Economics Ltd., and Wave Point Consulting Ltd., 2015.


