ECONOMIC DEVELOPMENT AROUND INTERMODAL FACILITIES IN CANADA

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Introduction

Freight distribution systems have changed significantly due in large part to the globalization of production. Expanding international trade has led to growth in both marine container shipments and air cargo. This has led, in turn, to development of new systems of surface transportation whereby goods in international trade move from their points of origins to marine ports and airports and then ultimately to their points of destination. These systems are characterized by the emergence of spatial clusters of logistics-intensive activities that serve a variety of functions. (For a review see Sheffi, 2012.)

Some of these clusters have become engines of regional economic growth. Based on cases like Alliance Texas Global Logistics Hub and Centerpoint Intermodal Center in Illinois, each of which has close to 30,000 direct employees, many regional governments and development authorities have defined the establishment of clustered transportation and logistics activities as major components of regional economic plans. The proliferation of recent and ongoing feasibility studies points to the prominence of logistics clusters in development planning in the US and Canada (McMaster, 2009; Boile et al., 2009; De Cerreño et al., 2008; Harrison et al., 2005).

This paper presents an initial exploration of the potential of logistics clusters as regional economic growth engines in Canada. It begins with a review of the "inland port" concept, whereby clusters develop around intermodal facilities connected to ocean ports. This is followed with a review of the main ocean ports and intermodal

facilities in Canada. The paper ends with discussion of the potential for cluster development and directions for further research.

Inland Ports

Historically, goods arrived at ports and were immediately subject to a variety of activities including customs clearance, warehousing, repackaging, distribution, and value-added processing. With the rapid growth in international trade in containers, concentration of these activities at the port leads to congestion. Also, port areas tend to have high labour and land costs. So in many cases it proves more efficient to immediately lift containers from ships to trains and move them inland some distance to where they can be handled more cheaply and efficiently. Not only does this cut logistics costs, it also reduces the tendency for containers to stack up at ports and therefore improves port turnaround times—a critical benefit because of the high cost of dwell time for giant container ships (Jones Lang Lasalle, 2011). However, it also eliminates many of the economic spinoffs that port cities previously enjoyed (9, 2008).

The term inland port refers to those places to which the containers are transferred, and where many of the logistics functions that normally take place at ports are completed. There is some confusion because the term "inland port" is sometimes used to refer to marine ports located on major rivers and the Great Lakes (Morton, 2005). Also, there may be some confusion between inland ports and "satellite terminals," which are generally located quite close to port facilities and used to handle overflow or to manage a relatively narrow range of functions (Slack, 1999). Inland ports are very large, relatively few in number, and serve a variety of functions including (Rodrigue et al., 2010):

- *Transloading* whereby goods are transferred from standard 40 foot marine containers to the 53 foot containers,
- *Consolidation/deconsolidation* whereby loads are either broken down to less than container loads or built up to container loads,

- *Postponement* whereby freight is held in temporary inventory and made ready for delivery to its destination at the moment at which is needed, and
- *Light transformation* such as labelling, packaging or other requirements that can be delayed until shortly before the goods go to the final destination.

Generally, a location can serve all the functions of an inland port only if it has the following seven key attributes (Allen, 2008):

1. Access to a major container port,
2. Intermodal facilities served by a Class I railroad
3. At least 1000 acres of total land
4. Status as a Foreign Trade Zone (FTZ)
5. Access to major highways
6. Access to a large metropolitan market
7. Access to a large, qualified labour force.

Given this demanding list of attributes, inland ports do not just spring up as the result of market forces. Rather, they are institutions that must be created, generally by real estate developers working in conjunction with a major railroad with a port connection, although a public sector agency may assume the developers role. The rationale for the development of inland ports is that distribution centres and other logistics operations can benefit from reduced drayage costs by locating adjacent to an intermodal yard. Therefore, the intermodal facility provides an external economy to surrounding properties. If the intermodal facility is located adjacent to land that is controlled by the developer, the external benefits can be captured. This means an inland port is generally developed in a greenfield location where land can be easily assembled. The key customers for these developments are major retail chains and third partly logistics (3PLs) providers, whose distribution facilities are found in all the major inland ports. Other customers include ecommerce fulfillment centres and light manufacturers who make intensive use of container-borne freight. According to industry sources (Jones Lang Lasalle, 2011), only nine US metropolitan areas host logistic intensive clusters that are widely recognized as inland ports: Dallas/Fort Worth, Chicago, Kansas City,

St Louis, Atlanta, Memphis, Inland Empire (Riverside and San Bernardino, California), Columbus and Charlotte. (Front Royal, Virginia, which has an inland port to handle containers from Norfolk, is often included in the list.) Most, but not all of these cities are located more than 1,000 km inland.

Canada's Ocean Ports

Port Metro Vancouver is the largest in Canada and the fourth largest in North America. Each year it trades with over 160 economies, grossing more than $75 billion. The port area covers more than 600 kilometres of shoreline and is located near the Vancouver Airport. Operating across container, bulk, break bulk, and automobiles, it handles close to 130 million tonnes of cargo per year. In 2012 it reached a peak value of 2.7 million TEU (20-foot equivalent units) in container traffic. It has access to three Class 1 railways and offers 28 major marine cargo terminals. Extensive on-dock rail facilities are provided and it has the capacity to handle Super Post-Panamax ships due to its deep-sea terminals. The port offers short-sea shipping and services for the forest and automobile industries (Port Metro Vancouver, 2012). In January 2008, it became a non-shareholder, financially self-sufficient corporation working with the Vancouver Port Authority. Very large infrastructure investments to support growth from the port have been made under the Government of Canada's Asia Pacific Gateways and Corridors Initiative.

Prince Rupert Port Authority (PRPA). Prince Rupert is a city of about 12,000 people in Northern British Columbia. Its port, which was previously dedicated to forest products, has been improved and expanded (with federal assistance) to handle containers and broader range of commodities. Major exports that are shipped from the port include: scrap paper, plastic, metals and recyclables; bulk and packaged agricultural commodities and products; and leather hides, which have become prominent for shipments to Asia, mainly China.

Located within the Prince Rupert Port Authority are three terminals—coal, grain and container—plus two cruise terminals as well as a log harbour. There are three cranes at the port with a planned fourth. In

2011, 420,000 TEUs were handled, of which 333,000 were loaded and the remainder empty. The port has the capacity to handle 750,000 TEUs annually. CN is the sole Class I railway serving PRPA. Logistics activities at the port are under development and there is room to develop a more advanced logistics park. Trans-loading facilities are available especially for lumber. Much of the containerized cargo handled in Prince Rupert is destined for Asia. Less than 50% of PRPA's total space, approximately 9.65 square kilometres, is used at present. There are two relatively large warehouse facilities but limited space for container storage. The governance of the port is under a board of directors appointed by the Federal Government of Canada. This coastal port is the main link to the inland intermodal terminal in Prince George (Prince Rupert Port Authority, 2012).

The Port of Montreal handles 1.3 million TEUs per year. It is a year-round intermodal facility that can handle vessels carrying as many as 4,800 TEU. An average of 2,200 ships and nearly 30 million tonnes of cargo pass through the Port each year. It is equipped with 15 dockside gantry cranes and 11 berths with four container terminals. Its more than 100 kilometres of dockside track are linked to Canadian Pacific (CP) and Canadian National (CN) railways, which connect to destinations Northern, Western and Eastern Canada as well as the USA. Over 2,500 trucks pass through the Port of Montreal each day, with highway connections into Eastern Canada and Ontario as well as markets in the Midwest and Northeast USA

The Port is open 24 hours a day, 365 days a year. Although winter can pose a challenge due to the formation of ice, icebreakers are used by the Canadian Coast Guard to provide first-rate navigation through the waters. Although this channel of the St. Lawrence River is one of the largest in the world, the Port has a low water line at about 11.3 metres (37 feet). The Port of Montreal's next development will introduce new technologies to deal with the shallow depths of the channel.

The Port of Halifax is located in Nova Scotia and serves world markets with its trans-shipment and feeder services. CN is the sole Class I rail service provider. Each year it handles over 1,500 vessels,

including cruise ships, and employs over 11,190 people. It is the deepest berth on the east coast of North America. Compared with other Canadian ocean ports, rental rates for container space are low and there is little congestion. Additionally, improved transit times are possible as a result of the long haul and regional truck transportation and drayage service (Port of Halifax, 2012). Two terminals are operated by Halterm (South End Container Terminal) and Ceres (Fairview Cove Container Terminal). It handles just over 400,000 TEUs in recent years, but has much larger capacity and could expand to 2.5 million TEUs. It handles containerized cargo, breakbulk, Ro/Ro cargo, bulk and reefer cargo. Other operations at the Port include a grain terminal, shipping of petroleum products from Imperial Oil as well as a storage facility of European automobiles located in nearby Dartmouth (Port of Halifax, 2012).

Governance of the Port of Halifax is under the direction of the Ministry of Transport since it is an agent of the Crown. All administrative operations and day-to-day activities are administered by the HPA (Port of Halifax, 2012). The two terminal operators at the port lease the land but the Port owns the equipment.

Major Intermodal Centres

As an intermodal facility is a precondition for the development of an inland port, major intermodal facility locations are discussed in this section. (While there are other points in Canada where it is possible to transfer a container, these are the points from which CN and CP offer intermodal services.) Most of these locations already have some cluster of logistics activities. Several developing clusters are the outcome of major public sector investments and development programs, while others are privately driven.

Prince George is the location of an intermodal facility owned and operated by CN. It is located in northern British Columbia midway between Prince Rupert and Edmonton. Most of the products handled at this port are forest products but it is looking to expand into the containerization of wood products. This facility both serves and is served by both Port Metro Vancouver and the Prince Rupert Port

Authority (PRPA) but has most of its dealings with the latter. CN Rail also serves both ports (Rodrigue, 2012).

In August 2011 CN announced an initiative to expand the existing intermodal facility, which is adjacent to the CN rail yard. In 2007, this $20 million distribution centre opened, with the goal of filling empty containers moving back to Asia through Prince Rupert. In 2011 about 400 containers per week were stuffed, with potential to grow to 700 (Cyr-Whiting, 2011). The main issue for Prince George will be monitoring the fluctuations in the world market demands for forest products, specifically in Asia (Rodrigue, 2012).

Port Alberta is located in Edmonton, Alberta, at the Edmonton International Airport and began operations in 2007, with a contribution of $1.5 million from the Canadian federal government. In 2010 it became an incorporated facility with three regional stakeholders: Edmonton Economic Development Corporation, Edmonton Chamber of Commerce and Edmonton International Airport. In 2010 it became an industry-led, not-for-profit economic development corporation, moving away from its government founders. It became independent of the Airport in 2012 (Port Alberta, 2012).

No assets or land are owned by Port Alberta. It acts and operates similarly to an economic development office and has no plans to operate logistics or terminal facilities. Due to its location it hopes to attract large logistics development projects to the land available (Rodrigue, 2012). Port Alberta has access to two Class I rail systems: CN and CP. In addition to its access to Port Metro Vancouver and Prince Rupert it also has access to Grand Prairie, Fort McMurray and other energy centres. In order to accommodate mass cargo movement, 1,400 acres of land have been designated to aeronautical infrastructure (Port Alberta, 2012). With the expansion and development of equipment and supplies that has come from the increase in intermodal traffic, it is looking to an oil sands development initiative at the intermodal facility (Rodrigue, 2012).

As noted by Rodrigue, “the governance structure of Port Alberta aims towards formation of a ‘brain trust’ similar to KC SmartPort in

Kansas City where a stakeholders' representative board is set and key issues are advocated" (Rodrigue, 2012: 46). Port Alberta hopes to develop activities based on containerized cargo. However, the major share of freight handled so far is commodity based (Rodrigue, 2012).

Calgary Logistics Park. CN is currently developing the $100 million Calgary Logistics Park that opens in 2013. The facility has warehousing capacity of over two million square feet with an entire land capacity of 680 acres. Northeast of Calgary in Rocky View County, Conrich will be the home to the CN intermodal yard. This location will offer key services including dimensional and heavy container handling, rail, liquid/bulk trans-load, intermodal, automotive compound, and warehousing and distribution logistics (CN, 2011). According to CN this location has the following benefits: co-location, prime land, low taxes, easy access and a superior rail service.

The Park, located just east of the Calgary Airport, has access to the TransCanada Highway and direct rail access to Port Metro Vancouver and Prince Rupert. During Phase I of development, 2.5 million square feet will be designated for warehousing capacity and in Phase II an additional 200 acres will be developed. As noted by CN, "Calgary sees a large share of activity from Canada's busiest port, with 40% of imports through Vancouver being distributed through this city. As well, approximately 40 million square feet of retail is in various stages of construction" (CN, 2011: 2, 5).

Rail services provide two inbound and outbound trains daily, one with intermodal services and the second serving merchandise traffic including major retailers such as Walmart. This facility has the capacity to handle 500,000 lifts per year and also has the ability to hold empty containers (CN, 2011: 4). As the third largest state-of-the-art distribution centre and intermodal facility in Canada, it will be the dominant logistics centre in Western Canada (CN, 2011).

Global Transportation Hub (GTH), a Crown Corporation located west of Regina, Saskatchewan, operates on 2,000 acres of land at the site of a new CP intermodal facility. It was developed with support from the Governments of Saskatchewan and Canada as part of the

Asia-Pacific Gateway and Corridor Initiative. It is already a mid-sized facility by North American standards, with capacity for 250,000 lifts per year with 425,000 square feet distribution centre. In its Phase II plan an additional 565,000 square feet of space will be added (GTH, 2012). In 2010 a Loblaws distribution facility joined the GTH and in 2012 the facility was expanded to accommodate increased volumes of food retail (Rodrigue, 2012). Three other major tenants have facilities at GTH: CP, Yankee Trucking and AFI Distribution Group (GTH, 2012). As a result of the Loblaws expansion, the GTH has the capacity to handle inland imported reefers, leading to the possibility of meat exports in the cold chain sector.

CentrePort Canada Inc. in Winnipeg, Manitoba, was created in 2008 as a non-share capital corporation as a result of provincial legislation under which 20,000 acres were designated for logistics park development. At the same time, the Government of Canada made financial commitments of more than $150 million to the project (Prime Minister, 2009). It has a mandate to operate as a "one-stop-shop" for business development and investment. It is a tri-modal facility (rail/road/air) and a Foreign Free Trade Zone (CentrePort Canada Inc., 2012-2013).

This hub is situated in the centre of North America and has access to all four gateways—north, south, east and west—via CN, CP and Burlington Northern and Santa Fe (BNSF). Within Canada, CentrePort is uniquely well connected to the Mid-Continent corridor linking Winnipeg to Kansas City, Laredo and the Mexican port of Lazero Cardenas (Rodrigue, 2012). It is also situated adjacent to the James Armstrong Richardson International Airport in Winnipeg, which operates on an around-the-clock basis and has FedEx, UPS, Cargo Jet Canada, Canada Post and Air Canada Cargo operations on site (CantrePort Canada Inc., 2012-2013).

CentrePort has 420,000 square feet of space available in existing warehouses and more than 2,000 acres available for development. About 150 companies now operate within the inland port's boundaries (CentrePort Website).

In terms of export commodities, the major containerized shipments are distiller grains, canola and soya beans. The most viable containerized exports are specialty grains, which are significant for Manitoba due to its strong agribusiness sector (Rodrigue, 2012). The economic success of CentrePort is in part dependent on the long-term viability of exporting grains in containers.

CentrePort is a Foreign Trade Zone (FTZ) that offers a variety of benefits to investors. As advertised, "custom bonded warehouse facilities and duty and sales tax relief. CentrePort Canada is the first and only inland port in the country to offer single-window access to federal FTZ benefits, which can help companies better manage imported inventories by providing cash-flow benefits" (CentrePort Canada Inc., 2012-2013).

Three major infrastructure projects supporting CentrePort are currently underway. The first project is a $212 million expressway to link the port to the regional highway system, expected to be completed in 2013. The second is the water and wastewater utility system to serve 1,100 acres. The third is developing a common use intermodal rail facility. This would be the only one of its kind in Canada, and would strengthen the draw of CentrePort by concentrating the intermodal operations of more than one Class I line (Rodridge, 2012).

*CN Brampton Intermodal Terminal (Toronto***)** CN Railways operates two logistics parks, one in Brampton (Toronto, Ontario), and the other in Montreal, Quebec. The Brampton Logistics Park is CN's largest in North America, offering "60 acres of land, one million square feet available for development of warehousing space for co-location, daily rail service to and from cities and ports, selective opportunity for intermodal location and has a free trade zone (FTZ) designation" (CN, 2012a). This intermodal facility is located near Toronto's Pearson International Airport, and near three major highways, the 401, 407 and 400. It has the current capacity to handle 1,455,000 lifts per year but is looking to increase that because of growing volumes of global container trade. It includes an automotive compound, a steel and lumber facility, handles liquid/bulk cargo and offers warehousing facilities (CN, 2012a).

In 2011, due to increasing volumes of container traffic at the Brampton facility, CN undertook several capacity improvements including increasing rail capacity by close to 15%, adding 25% more for staging international containers, purchasing five new cranes. These expansions also resulted in a 10% increase in total employment (CN, 2012b).

CP Vaughn Intermodal Terminal. The CP Vaughn Intermodal Terminal opened in 1991 and is located in the City of Vaughn, Ontario, part of the Greater Toronto Area (GTA). It initially had the capacity to handle 110,000 containers annually. It has since expanded to a capacity of 400,000 containers annually, with future expansion expected to rise to 700,000. This intermodal rail-truck facility is situated adjacent to the CP Rail facility on 770 acres of land.

CN's Montreal Logistics Park. Montreal's full-serviced logistics park is located in the downtown core of Montreal, Quebec. This facility offers its customers rail, truck and trade intermodal services to ship through the Port of Montreal. The same key logistics services provided by CN in Brampton are present in Montreal. These include full intermodal services with an automotive compound, a steel and lumber facility, handles liquid/bulk cargo and offers warehousing facilities (CN, 2012a). This logistics park has direct access to the Port of Montreal and has easy access to international, national, regional and local markets, offering the fastest transit to all ports within North America. Additionally, it is located 26 kilometres from the Port of Montreal, three kilometres from the Trudeau International Airport, and is near three major highways. (This facility more nearly meets the definition of a "satellite terminal" (Slack, 1999) than an inland port.)

Two additional intermodal facilities are not treated in detail here, but may become important eventually. The first is in Saskatoon, but development there is focused on commodities rather than containerized goods. The second is Moncton, New Brunswick, where a logistics hub has been promoted, but little development has taken place so far.

Potential for Cluster Development

There is limited information on the extent to which intermodal facilities have attracted development of distribution centres and value-added activities in Canada. Additional research is needed to explore the link between new TDL activities and location of intermodal yards.

In Central Canada, the largest employment clusters are close to, but not necessarily on, the properties of the private-sector intermodal developments. The status of Pearson International Airport reinforces the attraction of intermodal facilities to the Greater Toronto Area. The success of logistic developments driven by public sector initiatives is still unclear. There has been substantial employment clustering around the projects in Winnipeg and Regina, but CN's Calgary Logistics Park looks poised to surpass them as the largest cluster in Western Canada. As already mentioned, the success of public sector–driven clusters in the Prairies depends on whether export of grains in containers will prove economically viable in the long run.

In comparing potential Canadian clusters with the most successful clusters in the US, there are a couple of important points to keep in mind. First, nearly all US inland ports are located in or near a metro area with very large markets and labour forces. Among potential inland port locations, only Calgary and Toronto offer large local markets. Second, the geographical definition of FTZs in the US favours clustered development. In Canada, FTZs may be defined on individual sites, which detracts from their roles as clustering agents (see InterVISTAS Consulting Inc., 2011, for a review of Canadian FTZs).

It is also important to note that some of the most rapid logistics cluster development in Canada does not fit the inland port model. For example, Cornwall, Ontario, has been the focus of distribution centre development based on, among other things, the relatively short truck dray from the Port of Montreal. Development in Hamilton, Ontario, has been focussed on the airport rather than rail. (This fits the "Aerotropolis" model of logistics cluster development rather than the inland port model; Kasarda et al., 2004.)

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