INLAND PORTS TODAY

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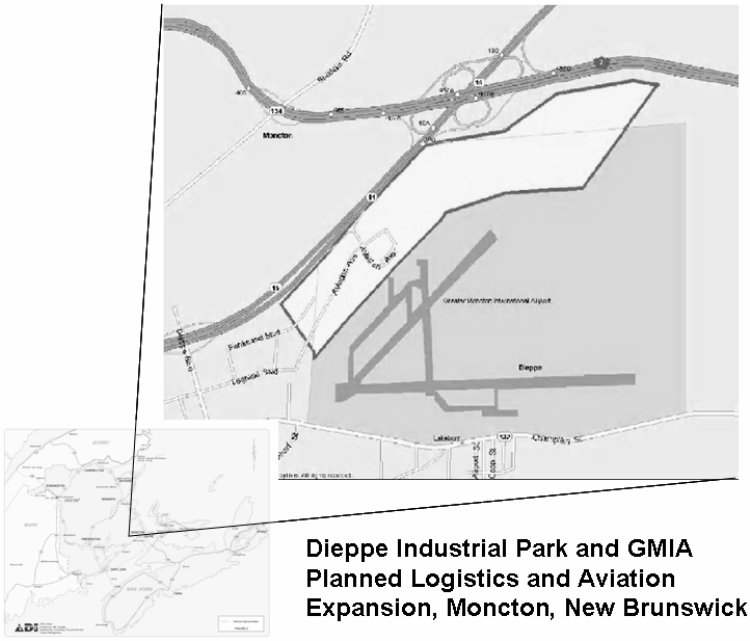
Traditionally, inland ports were located on waterways where bulk goods could be transferred from ocean-going ships to barges or other specialty vessels for continuing carriage inland by water. The term has come to be applied to other inland points that are not on waterways. Some leading examples are Alliance, Texas, and Huntsville, Alabama that are based on international airports with associated industrial park developments. Despite the focus on the air mode for international goods, rail-truck inter-modal transhipment is the largest growth segment.

The inland port is also used to describe reliever centres located inland of major ports like New York and Los Angeles. Congestion, limited land and high costs at coastal gateways encourage the shift of arriving containers to an inland location for import inspection, de-stuffing, value-added processing and onward shipment. The development of an inland port as a gateway is facilitated where the location is at a crossroads on two or more trade corridors. In addition to trade processing, goods can be sorted for onward transportation to multiple destinations.

Research into the "state of the art" of inland port development was undertaken in support of a feasibility study for developing the inland port role at Moncton, New Brunswick. Moncton serves as a regional distribution centre for the Maritimes because of its central location. As illustrated below, the Dieppe Industrial Park is planning to add 5000 acres that adjoin the Greater Moncton International Airport and straddle the CN Rail mainline and the Trans Canada Highway[i].



Dieppe Industrial Park and GMIA Planned Logistics and Aviation Expansion, Moncton, New Brunswick

Recently incorporated, the **Canada East Inland Port** (CEIP) could serve one or both roles of an inland port. Several hundred flights a week, including many wide-bodied freighter aircraft, over fly the CEIP every week between North America and Europe. The Greater Moncton International Airport (GMIA) has the facilities, and the expanding Dieppe Industrial

Park (DIP) has the land to serve a Huntsville-like role. This land could also be developed for the processing of marine containers shuttled by rail, or by Long-Combination Vehicles, from Halifax and Saint John to the CEIP.

One step in the feasibility analysis is an understanding of the nature of international logistics and the state of the art in development of inland ports. In addition to a literature review, this task was undertaken by case studies of inland port developments along the Mid Continent Corridor and in northern Europe. The findings are reported in this paper.

The Logistics of International Trade

The Total Distribution Cost (TDC) concept recognized that in addition to the direct cost of the rates paid to the transportation provider, there are many indirect costs such as inventory, financing, insurance, spoilage, obsolescence, not to mention theft. One effect is the growth of air freight. Air Cargo has the highest direct costs, but indirect costs are lower, especially for perishable and high value goods. TDC also stimulated the growth of containerization. The higher cost of container shipping was more than offset by savings in handling and security benefits. Containerization facilitated the inter-modal transhipment process so that the optimal combination of modes could be used to best minimize the direct transportation cost within the TDC of the supply chain.

As the management of logistics grew more sophisticated, it met another trend in management, the focus on core competencies and the contracting out of non-core functions. This spawned the growth in third party logistics (3PL) firms that specialize in handling logistics activities between the factory and the customer on behalf of these companies.

Courier companies developed before the internet became the new logistics supply chain for information. What could be more valuable, or more perishable, than information? Today, FedEx and its imitators - UPS, DHL, Purolator, have re-invented themselves as 3PLs as well as couriers, handling all aspects from the factory to the customer's door. They are not airlines, or truckers, they are logistics providers who will use whatever vehicle suits. FedEx Ground is getting as big as FedEx Air, and has warehouses located around hubs like Memphis (FedEx) and Louisville (UPS).

Logistics became the application tool for TDC in order to maximize efficiency and lower costs. Supply chain management adds the dimension of effectiveness in a strategic way, to develop competitive advantage. Wal-Mart developed supply chains that gave it competitive advantage over Sears and others, both in customer service and in lower cost. Dell developed a shorter supply chain for advantage over Hewlett-Packard that further improves customer service through mass customization – every customer becomes a segment of one, whose needs can be targeted precisely.

Risk management has come into play as global business becomes more complex, with more players and interdependencies. "Just-in-time" (JIT) delivery shipments are precisely planned as part of "lean manufacturing". Risk management recognizes that things will go wrong, at the worst possible time. Airbus recently had problems with a supplier providing wiring harnesses for its A380 super jumbo jet – its stock value crashed and its CEO resigned; lay-offs and factory closings continue. Supply chains now put some slack back into logistics processes to deal with the contingencies of nature, including humans.

These factors: total distribution cost, the rise of 3PL specialists, and risk management for supply chains define modern logistics industry. Two fundamental requirements remain to succeed as a supply chain in the twenty-first century. Firms must be cost competitive. Customers will not consider a change unless there is enough cost advantage to justify the risk. The second requirement is reliability. A customer may be signed on price, but a client is kept with reliable service.

The Development of Inland Ports

An Inland Port has been defined as: "a site located away from traditional land, air and coastal borders with the vision to facilitate and process international trade through strategic investments in multi-modal transportation assets and by promoting value-added services as goods move through the supply chain". This definition was developed in the pioneering work conducted in 2000-2002 by the Center for Transportation Research at the University of Texas at Austin (UTA) on behalf of the Texas Department of Transportation. Texas DOT commissioned the work due to increasing calls for transportation infrastructure to support the inland port at Alliance and development at San Antonio. The three key points of the definition are the location, which is non-traditional; the focus on international trade and value added processing, and the requirement for multi-modal assets.

The work at the UTA is from the perspective of transportation planning. This is also the perspective of Des Moines, where the early work was led by the Metropolitan Planning Organization which is responsible for transportation infrastructure. More recently, work in the field is driven by

economic development interests, as is the case in the Moncton study.

Note that the site of the physical facilities of an inland port is not part of the UTA definition. An inland port could be a specific site, or it could be all the distribution facilities and transportation services within the region. Initial developments focused on specific pieces of real estate. They have now evolved to the "virtual" port concept and envision their interests as taking in the whole region.

Case Studies

Case Studies are undertaken to examine the range of issues and challenges facing inland ports around the world. Particular attention is paid to the organizational structure, as well as the facilities and services provided. This breakdown resulted from analysis of findings from the first series of case studies where visits were made to existing North American inland ports associated with the mid continent corridor: Winnipeg, Des Moines, Kansas City, Alliance, San Antonio and Lafayette. The discussion is truncated to meet the CTRF requirements.

North American Inland Ports

Public-Private Roles - Governments, at all three levels, are important for their political support, but their actual involvement is better handled through an arm's length agency that is independent of political processes. The political interest can be represented through appointments to the Board of Directors of the agency. This public sector agency, with its independence and flexibility, can then partner with the private sector. The challenge is to stimulate private sector interest and

commitment. A champion can be especially helpful in encouraging business participation.

Roles for a Port Authority – Roles include both operations and marketing development. These can be undertaken by the same or separate entities. It is suggested that both functions be retained by an inland port authority, which is then responsible for both the infrastructure and promotion of the port as a whole; the private sector could provide the logistics services including marketing their individual offerings. The port authority could have directors appointed by both private and public sector interests, similar to the airport authority model.

Information Technology - Intelligent Transportation Systems (ITS) and high quality communications are essential in support of global trade today, not only for expediting freight and business but for the security requirements of a post-September 11th world. Whether a successful inland port development needs to use ITS as a driver of its development remains unresolved. Many logistics companies provide information services for their customers. The port authority, however, does need to be concerned with its IT infrastructure. IT connections are now as important as water and power.

Driving Change - Like many functions in society, one of the major challenges that an inland port must overcome is the inertia of supply chain participants to change the way they currently do business. There are risks associated with change, particularly as the leader, and there must be sufficient reward for the innovator to take the risk. The case studies and literature concur that it is very difficult to get established supply chain players, such as the international freight forwarders, to change how they do business. Demonstration services can help prove the route, but performance over time

must also be demonstrated and maintained at 100 percent, especially for the air freight markets.

Ultimately, the best time to achieve change in supply chains is during a crisis. This happened at the west coast ports in 1994 when many goods did not make it through the supply chain in time for the Christmas season peak. Many changes have been instituted as a result. One effect is that the west coast ports are not seeking new business as they are fully challenged to meet the growing needs of their existing users.

Identifying emerging trends and learning from examples of past crises should certainly be incorporated into a strategic marketing plan. But this does not mean that a jurisdiction promoting inland port development has to wait for a crisis. While change can be made to happen, it is more important to be prepared to take advantage of change as it occurs. Luck has been described as the intersection of opportunity with preparedness and this was the story of the development of Alliance – it was always identifying changes, in part through close customer relations, and stayed flexible enough to take advantage of new opportunities.

The Logistics Foundations - The size of the local market is very important in developing a port because it gives a foundation of services on which further through traffic can be handled. But a smaller OD market is a reality for many jurisdictions such as Moncton. But it is not essential to have a large OD market so long as it is sufficient to support the processing and facilitation services. Smaller centres can also take advantage of their proximity to trade corridors. While Southeast New Brunswick has a smaller OD market than some of the U.S. cases, the North Atlantic trade volume over the Maritimes between Europe and Asia with North and Latin

America is very large. A Moncton based inland port would only need a small share of that transit market to be very successful[ii].

Federal Inspection Services - In order to process international trade, at least imports, federal inspection services (FIS) are a necessity. In Canada, these are provided by the Canada Border Services Agency (CBSA). FIS are a cost of doing business, and a port can not do business without them. There have been some indications of CBSA becoming more business-like in their approaches. One example is the increasing use of IT in trade processing where goods documentation is provided to the authorities in advance for their review and they then conduct physical inspection only on a sample basis; even a small station like CBSA has at Moncton, with limited staff and hours of service, could handle a larger volume of trade as the EDI (electronic data information) can be processed by an inspector in Halifax or Montreal.

Marketing Approaches - The cardinal rule of marketing is to segment the market, and then differentiate the product for each segment's more precisely defined needs. In theory, every customer's needs are unique and the product should be uniquely suited to meet those needs – the Dell approach. Another way of looking at this is what "hook" can a new inland port development offer that distinguishes its services from the gateways that currently process the trade that it proposes to attract – where is its competitive advantage?

Security measures – Security has taken on greater importance in the post-9/11 world (not to mention August 2006). Containers are a particular concern, and have been called "the Trojan Horse of the 21st Century". The specific concern is a nuclear device or other "weapon of mass disruption" that is

designed to attack a major North American city. A Canadian port targeting U.S. destined goods could market itself as the "high security Inland Port", and offer intensive pre-screening service for containers entering the United States.

Providing Logistics Facilities - In addition to Federal Inspection Services for trade processing, a port needs to offer logistics infrastructure such as warehousing and transportation services. The question was raised with all the case studies whether it was necessary to develop facilities in advance of sales, that is, to build "on spec". Different approaches from doing planning work on spec for faster construction to deliberate over-building can minimize this cost, but it will be a cost for any new development to face.

Implementation Approaches - With product development and carriers defined, and facilities to the hard cost stage, an inland port can turn its approach to potential customer priorities for its marketing. The traditional approach has been to focus on carriers to provide services to the port, but carriers will follow the freight; their assets are mobile. Inland Port developers need to target the freight forwarders and other 3PLs who buy the carrier capacity on behalf of their customers, as well as the shippers who actually produce the product. It is certainly worthwhile to market to 3PLs because they need to be aware of service alternatives. One may even find an innovative 3PL willing to offer their shipper customers a new alternative that can save them money (not to mention increasing the 3PL company's margin). But ultimately, a developer may need to identify the producer beneficiaries and work directly with them, even if implementation will later require working with their 3PL provider.

Opportunities – The inland port concept is based on inter-modal transhipment, with trade processing at the point of transhipment between modes as well as regional distribution and as a cross roads for onward shipment. These could be sea-rail, rail-truck, air with technical stop/top-up, and air-truck. The development of trade processing is mutually supportive improving a port's competitive advantage to becoming an even more important distribution centre for its region. The inland port proposition is fundamentally a combination of trade processing and inter-modal transhipment functions at one location to provide supply chain economies.

European Inland Ports

The newer usage of the term Inland Port is not yet widespread in Europe. There is a large inland port association but it is based on the traditional definition of serving the water mode of transport on the extensive European river and canal system. Nevertheless, their experience is relevant to North American developments. The economics are no different if the goods are shuttled between the ocean port and the inland port by barge or other non-ocean-going vessel, or by rail or truck. As found in the North American cases, international trade goods will stop as little as possible; one means of minimizing "dwell time" is to combine two actions, such as transhipment between modes, with the import or export processing.

Containerized goods can stay in their containers until reaching a point where it is efficient to de-stuff them. Such a point will be at a cross roads where some of the goods may be continuing on one track while the others join other goods on another route or for de-stuffing for regional distribution, or ideally for both functions. The point where this process takes place can then also be attractive for adding the international clearance of trade

goods at the same time. Again, the intermodal transhipment role is mutually supporting with the trade processing role.

The ports visited were Lille, Rouen, Duisport at Duisburg and Luxembourg. Lille is very active in the European Federation of Inland Ports. Rouen is another northern Europe location with links to Dieppe through its economic work. Duisport had already been identified as the leading example of European inland ports. The meeting with LuxAir, the CargoLux terminal operator, proved to be of great interest as the facility handled air-truck inter-modal transfers. While LuxAir operations are centred on the air mode, it was not developed as an inland port; it simply became one as CargoLux's home base. Nevertheless, it is a leading example of an air-surface inter-modal inland port with relevance to what Moncton would like to develop.

Ports of Lille - Lille is a former mining and textile industry city that suffered economic decline in the 1960s until it began to re-develop on high tech and logistics. The Ports of Lille manages six sites within the metropolitan area and another five in the region. Lille is the economic capital of the Nord – Pas de Calais region and has a strong logistics industry and infrastructure as a gateway for northern and western Europe.

The port authority manages infrastructure on behalf of clients. The Lille Metropole is the second logistics hub of France and has positioned its marketing as "The European Logistics Hub". The region has three major ocean ports: Calais, Boulogne sur Mer and Dunkerque, the latter is a gateway for the inland waterway system that also connects with Antwerp and Rotterdam. Its river traffic ranks third in France while the Lille Lesquin Airport is France's fourth cargo airport. Lille handles 15% of France's rail traffic and is served by five major motorways. Intermodal container handling is the growth area

and it now ranks fourth in France. Lille is also the hub of high speed rail services being the first stop for Eurotunnel trains from London before they continue north to Brussels or south to Paris. Lille is doubling the size of its intermodal container port in downtown Lille, and is also developing Delta 3, a 300 hectare site 22 km west with 10,000 m^2. of new logistics buildings and a planned 20,000 m^2. extension. Lille promotes itself as a low cost centre with land being a fraction of the costs in London, Paris, or Brussels, while Lille is located at the centre of these three capitals.

Rouen - While Lille is inland of Dunkirk and Calais, Rouen is up-river from Le Havre. Rouen is at an earlier stage of developing an inland port focus but is well positioned as a distribution centre for the Normandy region, with several dominant industries such as automotive. The Upper and Lower Normandy region has 1.8 million inhabitants (similar population as Atlantic Canada), relatively sparsely populated for western Europe, and has no major metropolitan centre. It is industrialized with Renault alone having seven plants in the region; chemicals and petro-chemicals are also major industries. Le Havre ranks fourth amongst European ports and Rouen is the leading French port for grains. Le Havre is actively developing container processing with Port 2000 as a logistics and distribution industrial complex. Rouen sees a future role as an inland port in support of that containerized trade.

Duisport - Duisburg is at the geographical centre of the world's largest free trade area. It was a traditional inland water port on the Rhine-Ruhr river system, bringing coal and iron in and sending steel out. It has similarities to Lille in having had to re-invent itself for the 21st century economy. It set out ten years ago to develop container handling services, in part as an

inland reliever for congestion at Amsterdam and Antwerp, with interface with rail and road modes.

Duisburg positions itself as a European Gateway for intermodal cargo, with four container handling terminals, all connected by rail shuttle. Where volumes grew from 2.7 million tonnes in 1998 to 3.1 by 2002, recent growth to 7.1 million tonnes resulted from the deregulation of rail services. It is now served by twenty rail carriers, including its own Duisport Rail shortline, where it earns fees on its own 120 km of track. It chose not to handle perishables, where Bremen and Hamburg already served this German market, but automobile logistics has been a growth market.

Duisport's growth is an example of attracting container processing inland from seaports. They anticipate handling 1.4 million TEUs by 2008. Duisport is, however, on a much larger scale than the nascent projects to be supported by this research. Nevertheless, it has strategically chosen to focus on its own niches with its choices to not include the air mode or handling of perishable commodities.

Luxembourg - Located between Germany, France, Belgium and the Netherlands, Luxembourg has become an inland port for air cargo, based on the development of the air carrier CargoLux. From the perspective of an inland port, the key company is LuxAir, the operator of the air cargo centre, an inter-modal terminal designed to handle 500,000 tonnes a year that already handles 800,000. As a hub, it is not unusual for a commodity like cut flowers from South America to fly into Luxembourg, be trucked to the wholesale auctions in Amsterdam, and then be trucked back to Luxembourg to be flown to an Asian purchaser.

Summary

Inland port physical requirements can be categorized in three ways. The first is transportation infrastructure that includes the roads, railways and airports that are used by the transportation carriers serving each mode. The second component is the logistics infrastructure; the terminals for loading and off-loading transport vehicles or transfer between modes, and the warehouses and yards where goods are stored and processed. The third component is the full range of supporting services used in the processing and transport of goods. This includes information technology and its associated systems, training of logistics trade and professional personnel, consultants and other professionals working within the logistics system.

Beyond the necessary physical assets, the successful development of an inland port requires commitment and leadership from both government and industry, mobilized via a suitably structured and mandated organization. Most fundamentally, an inland port development must have a sound business case and a real competitive advantage. Strong commitment and determination is needed to achieve change in well established global supply chains. The pay-off in economic development makes the investment very attractive.

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[i] Several stakeholders partnered with the Atlantic Institute of Logistics to undertake the study which was contracted to ADI Limited in association with *Navigator Services*.

[ii] Similarly, a great volume of trade over flies Winnipeg every day; only a small portion using the Winnipeg Gateway for trade processing and crossroads transhipment would be a major economic development for Winnipeg's logistics industry.