International Trade, Transportation Corridors, and Inland Ports: Opportunities for Canada

Robert Harrison
Center for Transportation Research, The University of Texas at Austin, USA

ABSTRACT

International trade in 2007 continues to grow robustly, fueled by the liberalization of world trade, efficient global manufacturing—particularly in Asia—and efficient transportation that has managed (to date at least) to absorb higher fuel costs. Global transportation has benefited from a 30-year development cycle centered on containerizing non-bulk commodities and moving them on efficient vessels, railroads, and trucks through a variety of ports, rail systems and terminals. In addition, logistics has become an essential business tool for the profitable distribution of company products and services and has exerted a strong influence on the structure and nature of the distribution systems handling the container volumes. An aspect of this process is the growth of inland ports, where containerized products processing in undertaken prior to their forwarding to final points of sale or to smaller distribution centers, depending on the nature of the product and company size. This paper examines the role of inland ports and identifies their operations and life cycle based on research findings. It examines their role in transportation corridors and offers some thoughts on the likelihood of their successful implementation on the trans-continental Canadian rail routes, particularly those carrying Asian trade.

ACKNOWLEDGEMENTS

The author acknowledges the contribution of Sara J. Clark, TranSystems Corp., whose thesis first categorized Inland Ports for highway planning and programming. The Texas Department of Transportation (TxDOT) and the South West University Transportation Center (SWUTC) Region 6 program administered by RITA/US DOT also contributed to this paper through their sponsorship of related research. The author, however, is responsible for all opinions and material presented in the paper.

INTRODUCTION

In the early 1990s, the term “inland port” occurred more frequently in supply chain and logistics reports, particularly those published in the trade press. This was notable because, until that date, the term had always been associated with inland
The new definition of inland ports—as clusters of distribution and logistic centers located on a transportation corridor—indicated a completely different type of operation, mode, and commodity mix, all carrying profound implications for transportation planners, particularly those in state highway departments. Yet planners knew relatively little about both them and their impact on the transportation system.

Research conducted for the Texas Department of Transportation (TxDOT) in 1997 attempted to relate the emergence of inland ports to state transportation planning and programming activities (Harrison, et al., 1997). The development of single-company retail “big boxes” over the previous decade had resulted in creation of large-scale distribution centers. Increasingly, the deliberate exclusion of Department from the early stages of big box planning subsequently created problems related to highway access. These sites are large truck generators typically located on metropolitan boundaries (ex-urban) where rural roads predominate. TxDOT did not want to have the same problem arising with several inland port proposals being prepared in the state.

This work first examined the reasons for the growth of inland ports in the U.S. and found rather little in the literature. Inland ports enhanced those company supply chains increasingly associated with successful business operations and the reduction of “transportation-related waste that can add cost but no value” (Morash, 1999). Combinations of modes at inland ports potentially provide opportunities to reduce inefficiencies, particularly when value-added services commonly locate at an inland port site. An inland port can provide “a shared location for partners” that want to increase the efficiency of their supply chains—an important issue as land prices near U.S. metropolitan areas continued to rise (Robinson, 1999).

An inland port can therefore address inefficiencies by allowing the user to focus on primary activities critical to serving metropolitan markets, many growing at a rate that makes traditional single distribution center “big boxes” expensive and less efficient. At inland ports, elements such as space for expansion, the provision of housing, tax incentives, direct interstate connections, intermodal rail facilities, and air cargo operations can form the building blocks for competitive advantage. When distribution, warehousing, and manufacturing work together at an inland port, uncertainty related to supply chain components and international processing might be reduced (Leitner and Harrison, 2001). However, homogeneity is not a key characteristic of inland ports—they come in a variety of shapes and sizes.

**TRANSPORTATION MODES**

All inland ports are multi-modal and led by a single pre-eminent mode. The group of U.S. inland ports established by the mid 1990s, focused on the projected growth in airfreight and therefore selected air as the main mode. This was interesting because the one key element of air service—provision of runways, taxiways, and parking areas—is expensive and would suggest that revenues would have to wait

---

1 For example, the U.S. Army Corps of Engineers regularly publishes a table ranking inland ports by both tons and trip ton-miles. The 2003 ranking identified Huntingdon-Tristate on the Ohio River as the leading U.S. inland port (USACE, 2005).
until a substantial investment was undertaken. Why then was air popular? The trend was, for the most part, a consequence of the U.S. Base Realignment and Closure (BRAC) commission, set up to periodically assess the continuing need of all military bases throughout the world. In reviewing the recent assets of the U.S. Department of Defense, five sets of closures were recommended by the commission in the years 1989, 1991, 1993, 1995 and 2005, resulting in the closure of over 350 bases—many operated by the U.S. Air Force (BRAC, 2005).

Base closure often results in the offering of the facility to the local community for a nominal sum, although the condition of the facilities varied and substantial investment was often needed before commercial activities could be undertaken. Nevertheless, the bases generally looked to be a bargain. This intrinsic asset value spurred the authorities—city or county—to consider how best to use a base for economic development, principally to compensate for the loss of employment and taxes associated with the base closure. The opportunity for economic development through the creation of an inland port gained strength, and by 1995, several sites were being promoted—with varying degrees of success—as inland ports. These included sites at San Antonio, Texas (Kelly Air Force Base [AFB]), Columbus, Ohio (Rickenbacker AFB), Kansas City, Missouri (Richards-Gebaur AFB), and Riverside, California (March AFB), while other inland ports were extensions to existing airport facilities, as at Huntsville, Alabama. An exception was the site developed at Alliance, Fort Worth, where the Perot family had purchased over 16,000 acres of ranchland to pursue a planned multi-facility development—in effect, a new city built around transportation services (Leitner and Harrison, 2001). A development company, Hillwood, manages the facility and offers the seven characteristics for a successful large inland port shown in Box 1. Strong financial backing is also critical, since Hillwood’s substantial resources allowed it to undertake multi-year promotional and development strategies.

Airfreight weakened as the main inland port mode in the mid-1990s as Asian—particularly Chinese—containerized imports influenced U.S. transportation networks, particularly rail corridors. The cost advantage of double-stacked container rail systems over trucking were so profound that rail intermodal demand grew quickly, especially on the east-west (for distances over 700 miles) systems servicing the Ports of Los Angeles-Long Beach. This “land bridge” became the preferred way to move Asian goods to central and eastern U.S. population centers from the west coast and, in turn, increased the need for distribution centers located near rail intermodal terminals. Alliance, for example, attracted a new BNSF Railway intermodal terminal for such trade in 1994 and rail soon became the dominant mode at the site, reaching 700,000 TEU lifts within a decade. This heralded the creation of a series of inland port sites that now had intermodal rail as the dominant mode and international trade as the main commodity source.

<table>
<thead>
<tr>
<th>Box 1: Inland Port Recipe—Alliance Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Base population 3 million</td>
</tr>
<tr>
<td>2. Multiple modes</td>
</tr>
<tr>
<td>3. 5,000–10,000 acres</td>
</tr>
<tr>
<td>4. Tax and other incentives</td>
</tr>
<tr>
<td>5. Strong employment base</td>
</tr>
<tr>
<td>6. Telecommunications</td>
</tr>
<tr>
<td>7. Foreign Trade Zone stations</td>
</tr>
</tbody>
</table>

Inland ports with rail as the central mode have been started at two locations near Chicago—Joliet (Logistics Park, BNSF) and Rochelle (Global III, UP)—Memphis (BNSF), Dallas (Wilmer, UP), and several other sites served by the Class 1 railroad companies.

The definition and role of inland ports continues to expand, now as extensions to deep-water marine port terminals where expansion is limited by cost, environmental issues, or congestion. The Port of New York-New Jersey has for some time planned an inland port network where a central hub terminal is served by barges taking containers to smaller regional terminals served by rail, which then transports the boxes to inland ports closer to the various population centers in the port hinterland (Ellis, 2001). More recently, container terminals at the Port of Virginia will be able to use a shorter Norfolk Southern route termed the Heartland Corridor, which serves Chicago 24 hours earlier than do current routes. It will also service the inland port of Columbus, which will allow boxes to be lifted and drayed to nearby metro markets such as Philadelphia.

The term “inland port” is now sufficiently mature to refer to a site at which offers several combinations of mode and types of operation. However, the variety of activities of ports, rail, inland ports, and truckers are rarely the deciding factor for the successful implementation and operation of inland ports on the supply chain. BNSF, no doubt impressed with the success at Alliance, coined the phrase “Logistics Park” for other versions of Alliance-type terminals and calculated there were approximately five to seven similarly sized sites on its network. However, BNSF prefers to operate the rail terminal and leave the overall inland port site containing the facility to a commercial developer with the drive, ability, and financial backing to manage the port successfully. The promotion, financing, and management of new inland ports are now usually given over to a commercial developer such as Hillwood (Alliance) or the Allen Group (Wilmer).

**INLAND PORT CLASSIFICATION METHODOLOGY**

In the mid 1990s, there was a lack of consistency in the literature regarding the definition and functions of the new inland port. The work undertaken for TxDOT, therefore, had to develop a classification method for planning staff to use at the Departmental District level. There is yet no deterministic approach to identify the development of inland ports, which forced the researchers to consider the various macro-economic factors at work in the global economy and relate them to the factors identified through interviews with a variety of inland port authorities. Professor Button, at a recent Canadian workshop on international trade, referred to this process as “contextual” (Button, 2007).

The method begins by identifying inland port sites that desire recognition by a state highway department and incorporation into its highway planning process. The second step uses a five-point system to determine whether the identified site meets the criteria for inland port designation. The site becomes one of four major activity types if it meets the five critical needs. Next, its development life cycle stage is determined by describing current activities. The product life cycle concept captures the wide variety of types and growth stages seen in the literature. The designation of life cycle stage allows transportation planners to determine the level of trip generation and highway impacts associated with the port site. This
classification system addresses both the requirements inland port site developers
must meet and the expected programming response of the transportation agency.
Figure 1 illustrates the steps followed in the classification methodology.

**Evaluate existing site**

The first step is to identify the site under consideration for inland port
classification. This site may currently operate as an industrial park, intermodal hub,
or river port, or might not operate commercially but display logistics potential.
These sites include closed military bases (“Brownfield”) or undeveloped sites
(“Greenfield”). The site proponents may be private developers, like Hillwood, port
authorities, or economic development agencies. In this early stage, it is important
to understand whether the site currently functions, because it might already be in
the state transportation planning process and not need classification as an inland
port.

**Evaluate critical needs**

Once the existing characteristics of the site have been determined, the second step
is to complete an assessment of the five initial critical needs of inland ports to
determine whether the site meets the criterion of an inland port. Five critical needs
form the preliminary inland port evaluation sub-criteria and are appropriate both
for new sites evaluated by transportation departments or for agencies evaluating
investment in inland ports. Sites that meet the critical needs have the potential to
become viable inland ports, provided they receive additional transportation
enhancements throughout their development. Following are the selected
requirements:

a. Modal capabilities
b. Existing demand
c. Location advantages
d. International trade facilitation
e. Management plan

An inherent requirement at an inland port, by definition, is a variety of
transportation assets. Therefore, modal capabilities in the form of highway
connectivity and availability or proximity to rail, air, or waterway transport are
necessary. Demand, in the form of cargo shipped and the availability of motor
carriers, logistics firms, or freight forwarders, must exist for inland ports to
survive. If a site does not have this type of asset base, it will be difficult for an
inland port to be successful. Locations with a large population base within close
proximity are at an advantage because they can provide both workers and a
market for the companies locating operations at the inland port. Harder suggests
investments in large metropolitan areas have a higher expected financial return
and this indicates a potentially higher level of success for inland ports located near
large metropolitan areas (Harder, 1999).

According to the United Nations Electronic Data Interchange Working Group,
“trade facilitation deals with the requirements and procedures related to the flow
of information needed for the international movement of goods” (UN/EDI, 2000).
Administration of these requirements has been simplified and standardized by moving from paper to electronic documentation, so electronic communication systems (such as fiber optic networks) are a necessary component of the international trade facilitation and must be recognized. Finally, a strong management plan is necessary for an inland port. An inland port cannot achieve success without capital funding, marketing, and public/private cooperation. Many port and economic development authorities have taxation capabilities and bond issuance privileges and a financial plan is a necessary element of an inland port’s management plan. It is noteworthy that a number of groups promoting an inland port site overlook this critical aspect of the way the market evaluates their proposals.

---

**Current Site**

- Industrial Park
- Intermodal Hub
- River Port
- Brownfield
- Greenfield

---

**Evaluate Five Critical Needs**

1. Modal Capabilities
2. Existing Demand
3. Locational Advantage
4. International Trade Facilitation
5. Management Plan

---

**Initial Inland Port Class**

- Inland Waterway
- Air Cargo
- Maritime Feeder
- Trade and Transportation Center

---

**Determine Development Life Cycle Stage**

1. Preparation
2. Establishment
3. Expansion
4. Stabilization
5. Reduction

---

*Figure 1. Inland port classification flowchart*
Private proponents may use venture capital or loans to fund development. Marketing is an important element in any inland port management plan. Marketing staff must successfully attract businesses that will anchor the site and subsequently attract supporting businesses. Finally, partnerships in many literature sources remain a key component of a successful management plan. For instance, when partnerships are created with Metropolitan Planning Organizations, zoning and land use changes can be made to benefit operations at the inland port (Harder, 1999).

Assessing each of the five critical needs for a site should generate sufficient information to determine if the entities promoting the site have a clear plan that will promote a successful inland port. The site under consideration is then designated as an inland port by the transportation planning and programming authority when these elements are addressed. The next stage in the inland port evaluation process is to characterize the type of port and its likely modal planning impacts.

**Determine inland port modal classification**

The four classes are from the TxDOT project case studies and literature reviews on inland ports, although as inland ports grow, they tend to have equally important intermodal activities and the boundaries between the modal classes become blurred. The classes are:

1. **Inland Waterway Ports:** These ports are not a new concept in international and domestic freight movement. In the US, 25,000 miles of navigable waterways exist on rivers, the Great Lakes, and coastal waterways (Muller, 2000). This class is significant by virtue of its inland location and volume of goods transported into US markets. An example of this type of inland port is Duisburg, Germany.

2. **Air Cargo Ports:** Air cargo ports can exist in conjunction with passenger facilities but it is becoming more common for dedicated cargo facilities to operate in the United States. Examples of this type of inland port are Rickenbacker Air Industrial Park (part of the Greater Columbus Inland Port), the March Global Port, and Alliance.

3. **Maritime Feeder Inland Ports:** This inland port type provides a consolidation or de-consolidation point for goods shipped to a congested coastal load center port. Examples of this type of inland port are the Virginia Inland Port and the Port Inland Distribution Network at the Port of New York/New Jersey. In southern California, the ports of Long Beach and Los Angeles serve a market of over 32 million people within a 350-mile radius of the port terminals (Biederman and Dibenedetto, 2007). This market is quite different from inter-state destinations to which double-stack rail moves most traffic. Numerous distribution centers, which are collectively termed the “Inland Empire” service the domestic Californian market of the two ports. Most are single point activities and not clustered into inland ports, although approximately five sites are now potential intra-state inland ports.

4. **Trade and Transportation Center Inland Ports:** This occurs when border processing of trade shifts inland (sometimes out of state) and multiple modes of transportation can be offered in combination with value-added services. These ports can range in scope from a single site where intermodal connections are
located to an entire city that facilitates international trade through the encouragement of various trade and financial incentives. The latter is the highest form of inland port because it represents multiple activities and a sense of community building. Examples of this type of inland port are Alliance, the Port of Battle Creek, and Kansas City, Missouri.

Remember that his classification step was necessary because neither TxDOT staff nor some inland port proponents knew much about the variety of inland ports and their main characteristics, so a two-dimensional approach was necessary. First, the various classes needed to be established, then the state of commercial activity—both current and future—measured or predicted. The next section examines this issue.

**Determine the inland port development life cycle stage**

It is challenging to evaluate inland ports and derive general conclusions that can be used effectively by planners. Anyone can claim to have an inland port site, and can use the term, as they consider appropriate. Moreover, some choose to avoid the term altogether and use a term that differentiates their marketing effort from that of their competitors. The term is highly elastic. What is clear is that inland ports, for a variety of reasons, have historically been difficult to get off the ground quickly. The period required to follow a business model to the point where an unbiased observer could call it a success can be long—even a decade. Because an inland port seems to have a distinct life cycle (with many stuck in the early stages of the cycle), researchers in the TxDOT study chose to adopt the product life cycle used in marketing. The following section describes the product life cycle and the adaptation of inland port stages into development life cycles. The method determines both the development life cycle stage of the inland port and the support needed by transportation planners at each stage.

**The inland port life cycle**

The product life cycle is a well-established marketing concept that tracks the course of a product’s sales and profits over its lifetime. Typically, an asymptotic curve broadly fits the shape expected of a product or service over its lifetime, with flat sales and profits over the development phase, steep contributions as the product or service becomes successful, and a flattening as full market share is reached (Kotler and Armstrong, 1999). The product life cycle is conceptual because individual product patterns are variable in shape and duration, and in reality, there is no fixed sequence or length for the identified stages as they relate to an inland port. Therefore, this concept is used as a planning tool to help transportation planners characterize and develop alternative strategies. A valuable use of the product life cycle is as a control tool to measure a product against similar products (Kotler, 2000), which suggests that a state transportation planning agency could, over time, develop a portfolio of stages for all evaluations of potential inland port sites.

The life cycle of an inland port establishes five stages of commercial activity and development: Preparation, Establishment, Expansion, Stabilization, and Reduction. At each stage of growth, an inland port follows a general behavior, as in
the product life cycle. In addition, as with the product life cycle, it is difficult to
determine the exact sequence (timing) and the exact events (factors) that will
occur in each stage. However, Table 1 provides a general model for the
development life cycle stages at an inland port. The table shows each of the stages
and gives a summary of some of the potential activities that will occur at each
stage.

**Preparation:** The planning stage activities are straightforward but sometimes
take place with little or no communication with state transportation agencies. This
is certainly the case with many “big boxes,” where those responsible for highway
planning may be (deliberately) omitted from the process until enough local support
ensures that highway issues will not prevent its construction. This strategy is more
difficult (and dangerous) to follow when an inland port is being proposed. Highway
links may be critical to the success of the venture and at some point in the future
the port developers will need state transportation help, in one form or another. All
sites that do not have commercial activities fit into this category. In this stage,
because there is no income, financial resources—some substantial—are necessary.

**Establishment:** Investment in transportation assets is necessary before a site
begins to have a commercial impact and such activities vary based on the mode
chosen to drive the early development. Alliance, for example, had to construct an
airfreight facility from scratch, together with substantial highway links provided by
a partnership with TxDOT. Great efforts are then typically made encouraging well-
known companies in the retail, manufacturing, and logistics sectors—termed
“anchor tenants”—to locate at the site. This effort takes two forms: an actual
building built by the developer and ready to occupy (“spec”), or a facility built to
order for a named company. As during the first phase, this is a time when
investment resources at the site are greater than income from tenants and
transportation activities.

**Expansion:** Expansion, when it arrives, is the point at which site income exceeds
the costs invested in the facility. It is also a time for offering new services, so
adding more value to the site—for example, when logistics and light manufacture
complement warehousing and distribution functions. In this phase, the community
(city, county) begins to receive payback in terms of greater tax inflow and job
creation. Highway needs are likely to grow and a good relationship with the state
department of transportation offers the likelihood of a good resolution to
increased traffic demand.

**Stabilization:** The next phase occurs as the site is built out and development
passes to ancillary services that are not always directly related to transportation. A
Greenfield site, for example, may build new housing and family-related services to
provide a convenient living space near the facility. In this sense, the undertaking
becomes one of “city building” much like the railroad towns in the late nineteenth
century, which became cities and towns in their own right. Clearly, this is a long-
term phase and one most inland port planners will not reach.

**Reduction:** The final phase is when modal change, together with developments in
trade, logistics, and distribution, cause users to move from the site to other areas
or for core businesses to simply decline. It may also create opportunities for
reinvention. A number of German coal terminals on the Rhine have successfully
taken on the role of inland ports (most notably Duisburg), serving the local markets by changing from coal to containers.

This report has provided a method for classifying inland ports accurately, allowing transportation planners to schedule investments, either solely or as public-private partnerships. However, is any of this relevant to Canada? The next section considers some of the features of Canadian gateways and corridors in terms of inland port development.

**Table 1. Inland Port Life Cycle Stage Characteristics**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| I     | Preparation (Planning) | • Evaluation criteria fulfilled  
• Proponents began to attract companies and local support |
| II    | Establishment (Operations begins) | • Modes established or planned  
• Anchor tenants arrive |
| III   | Expansion (Growth in modes and services) | • Planned modal investment takes place  
• More sectors begin to locate on site  
• Cluster theory materializes |
| IV    | Stabilization (Non-commercial activities undertaken) | • Companies invest in expansion of current facilities  
• Non-trade services (e.g. housing) are undertaken  
• Slow down in new arrivals |
| V     | Reduction (changes in logistics and distribution) | • Companies begin to leave for better options elsewhere  
• New private sector trends force change in operations |

**GATEWAYS, CORRIDORS AND CANADA**

International trade moves into Canada by ship, truck, and plane and the initial gateways are at Canada’s land and sea borders or the airports handling the initial flight arrival. U.S.-Canadian border towns add little value in terms of transloading, warehousing, drayage, or consolidation of trucking, unlike the southern U.S. border (particularly in Texas), where these services are vital for local economies. Speed is of the essence, and any truck delays at border checkpoints create problems that must be resolved. This is seen with the shipper complaints regarding new U.S security requirements, even though many have been in force at the U.S southern land border. There seems little opportunity or reason to promote an inland port for trucking. Shippers moving containers through Vancouver have three Class 1 railroads to move product to large North American markets—a major asset to international shippers. Notwithstanding this and other key advantages, including proximity to Korea and other Asian gateways, it appears that concerns raised by some citizens about unbridled growth in container volumes may curb opportunities for maritime-linked inland ports. Finally, air international trade continues to grow.
vigorously and shippers have many alternatives to serve Canadian markets—all large markets have facilities that can handle freight.

The most likely locations for new inland ports in Canada, therefore, appear to be along the transcontinental rail corridors, at major markets or at the final marketplace. The most common form is a “bar bell,” putting the inland port at either end of the corridor. The antipathy shown towards further container handling at Vancouver terminals might be moderated if containers could be processed away from the city and taken there by some “external cost neutral” system, like barges or Maglev systems. The proposed container terminal plans at Prince Rupert do not include linking to a nearby inland port. Double-stack on or near-dock trains will take product to eastern markets exactly as it is carried on the vessel—in various types of ISO container. Why might this be a less than optimal way of moving containerized cargo through Prince Rupert?

The answer lies in the dimensions of the smaller International Standards Organization (ISO) maritime box and larger domestic box (Katims, 2006). Prices charged by both the marine carrier and the railroad to move the various sized boxes can make it advantageous to unload the smaller box near the port and put the contents into a larger domestic container for rail delivery. In recent years, up to 20 percent of marine containers containing product for out-of-state markets and up to 80 percent of product for California are unloaded near the port and transloaded into the larger domestic containers for U.S. markets and 53 ft semi-trailers for trucking to California destinations. If the prices charged by railroads permit, it is possible to unload the steel maritime box and return it for further dispatch (so reducing demurrage) while reducing the number of ISO containers that move inland to final destinations. However, to be effective, transloading has to take place near the port of entry.

It is possible to build a commercially successful inland port serving a medium-sized city market; an obvious candidate would be Winnipeg, with a current census metropolitan area (CMA) population of over 700,000 people. While not large enough to exist solely on international rail traffic destined for the CMA, the site could combine airfreight to offer the prospect of exceeding break-even volumes. The rail terminal would need to be in the 300-acre range to handle containers efficiently, with potential room for expansion. If established, such a site could undertake free trade zone activities, light manufacturing, and offer related logistics services. It might also move goods south into the U.S., particularly to Chicago (approximately 700 miles away) by truck or rail.

The dynamic nature of distribution and logistical systems simply reflects the operator and shipper struggle to control costs and meet financial targets. Maersk recently announced that it intended to reduce its shipper options in North America from around 250,000 to 50,000, presumably by edict and pricing. Since Maersk is a market leader in container shipping, other large carriers might follow its example and concentrate moving traffic on routes where economies of scale can better exploited (Mongelluzzo, 2007). This could be an opportunity for Canadian planners to strengthen the key routes and services offered on those routes to provide competitive transportation corridors with U.S. alternatives.

Container volumes to North America are predicted to keep rising with both global trade and the North American growth in population. The United States now ranks second (after China) in container moves, and one in nine global container
moves are either bound for, or coming from, the U.S. market (BTS, 2007). Concerns about handling the projected growth are now significant, and will become more pressing as congestion, air quality issues, and noise increase at the areas immediately surrounding the major terminals. The BTS report recognizes the importance of the west coast terminals, now handling 55 percent of total containers, up from 42 percent in 1980. Shippers are already starting to use other Asia-North America routes, including the Panama Canal, the Suez Canal, Mexico, and Canada, in an effort to spread the growth across a variety of transportation corridors. The role of the terminals at both Vancouver and the proposed Prince Rupert site could generate demand from various shippers and steamship companies. While the business model proposed—load at the port and unload at the final destination—works currently for the Canadian railways, more traffic might be generated if the rail corridors served inland ports en route to their final destinations. A decade of work suggests that this latter option could be profitable for both railroad companies and the larger communities through which their system passes. It is therefore reasonable to believe that Canada can support two inland ports on its trans-continental routes, including one in the west.

REFERENCES

Base Realignment and Closure (BRAC) accessed April 2007, see www.defense-link.mil/brac/
Ellis, W.E., Port Authority of New York and New Jersey Inland Satellite Ports Initiative, presented at the 80th annual meeting of the Transportation Research Board, Washington, D.C., January 2001
Harrison R., R. Henk, J.P. McCray and J. Prozzi, Impacts of Inland Ports on Trade Flows and Transportation in Texas, Research Project 0-4083, 3 Vols, Texas Department of Transportation and U.S. Department of Transportation, Federal Highway Administration, Center for Transportation Research, University of Texas at Austin, Austin, Texas 2001
Leitner, S.J. and R. Harrison. The Identification and Classification of Inland Ports. Texas Department of Transportation Report 4083-1, Center for Transportation Research at the University of Texas at Austin, Austin, 2001.


