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# The Dimensions of Value Added in Gateways and Corridors: Adding Value to National and International Logistics System

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**June 2008**

## Introduction

In May 2008 CIBC reported that the rise in transportation costs driven largely by oil price increases over the past 3 years had undone 30 years of tariff reductions from trade negotiations. In effect transport costs, not trade barriers were said to be the largest barrier to global trade. This follows a period in which declining transport costs were fostering the development of more complex global supply chains.

Whether the move to low cost country sourcing could be trumped by higher and increasing transportation costs is worth contemplating. The CIBC report suggests that transportation costs could well lead to a potential shift of production from Southeast Asia to Mexico and South America.

The CIBC report might be viewed as a short to medium run view. In the longer term higher oil prices will stimulate innovation and the development of new technologies that can mitigate the impact of higher oil prices. Yet the rapid rise in transportation costs creates uncertainty. The emerging relative cost change between labour and transportation costs raises a fundamental question of the global supply chain environment of increasingly disaggregated production and sourcing. Traditional trade analysis focuses upon the whole firm and generally thinks in terms of finished goods or inputs (commodity) trade rather than component or assembly trade; hence the notion of 'good' exports and 'bad' imports. A modern supply chain view of the world recognizes trade as essential to competitiveness because trading partners are building products together.

The role of gateways and corridors in a traditional trade view of the world is one of *volume and throughput*. Scale and cost efficiencies reduce the friction of trade and allow firms to exploit existing cost advantages by expanding market size. Lowering cost in one part of the supply chain is no guarantee of benefit. Cost savings depend on the upstream and downstream market structure. On the other hand, the role of gateways and corridors in a global supply chain view of the world is to improve the competitiveness of supply chains not individual firms. The focus is not volume but value, because the objective is to minimize the sum of supply chain costs.

What we want is the optimal amount of trade not a maximum amount of trade. But what is the basis for this 'optimum'? Is it maximizing growth, productivity, economic welfare or as suggested minimizing total supply chain costs? And as importantly, 'how' do we add value? Value added could mean engaging in more activities that maximize the margin between input costs and sales. Value added could be providing additional services (financial, logistics, consolidation, sorting). A broader view could be adding value more in terms of internalizing externalities of upstream and downstream players in the supply chain to minimize the sum of supply chain costs. Value to who is an important question in the definition of optimal trade.

This note explores the dimensions of value added in gateways and corridors and is organized in the following way. The next section provides a brief summary of what we learned from the series of Roundtables and International Conference held last year. Following this is a discussion of what we mean by 'value adding and value added'. This includes a perspective on the public role in value creation and the value of gateways and corridors. Next is a brief discussion of value creation with public-private co-investments and value creation under global restructuring. A case study of Singapore is briefly discussed to illustrate a successful 'value-adding' strategy. We conclude with a brief section describing fundamental questions in shifting from volume to value.

## Background

In 2007 the Asia Pacific Gateway and Corridor Research Consortium<sup>1</sup> completed three roundtables in Regina, Winnipeg and Calgary and a major international conference in Vancouver to better understand the role of Asia Pacific Gateways in Canada's development prospects. These events brought business, academics and policy makers together to examine the role of gateways and corridors in the development process, examine the best international practices and to assess some of the implications for Canada. The major findings from the conference and the workshops were published in two volumes entitled: *Canada's Asia-Pacific Gateway and Corridor Initiative, Policy, Trade and Gateway Economics (Vol. 1) and Gateway Logistics, Ports and Environmental Challenges (Vol.2)*<sup>2</sup>. These two volumes contained 42 papers covering six research areas, reflected in their titles.

The findings from both the Prairie forums and the Vancouver international conference made it clear that Gateways and Corridors are playing an increasingly important role in the economic development process. While our understandings of the development process may not be as certain or understandable as we might like,<sup>3</sup> it is considered that gateways and corridor combinations can play a transformational role in global value chains and regional productivity.

Specifically, the gateways and corridors infrastructure, system logistics and contact networks into markets and supply areas are extending the regional development process well beyond the region and the nation state. In doing so, they enable increased levels of competition for domestic suppliers, create incentives for productivity gain and at the same time bring forward new opportunities for investment and market access. They increase the opportunity for domestic firms to participate in global supply chains. The traditional hinterlands of coastal ports have now become linear and global with surrounding access zones. Measures of gateway and corridor efficiency are now critical to overall system efficiency and to the viability of particular gateways and corridors combinations within wider global networks.

In his synthesis of the Vancouver Conference, Morrison (2007) provides a succinct statement of the messages coming out of the roundtables and conference.

- As of 2006 to 2007 there was massive congestion and pressure on gateways and corridors all across North America, driven by the dramatic current and projected increases in cargo flows emanating from China. It is not just about China though: India, Russia, and Brazil amongst others will be an increasing part of the future equation.
- We need more analytical models of transportation networks to provide a structured understanding of the complex inter-relationships between the nodes (gateways and hubs), links (corridors) and jurisdictional borders combined with strategic competition in transportation networks.

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<sup>1</sup> The Gateway and Corridor Research Consortium consists of the Centre for Transportation Studies of the Sauder School of Business at the University of British Columbia, the Van Horne Institute of the University of Calgary, the Organisation for Western Economic Cooperation in Regina and the Transport Institute of the Asper School of Business at the University of Manitoba. Its objectives are: *to focus national and international academic attention on the concept of international transportation gateways and corridors, to bring national and international experience to bear on the Asia-Pacific Gateway and Corridor concept and to review the implications for transportation and infrastructure policies to realize gateway and corridor related development opportunities.*

<sup>2</sup> Gillen, D., Parsons, G., Prentice, B., and Wallis, P., *Canada's Asia-Pacific Gateway and Corridor Initiative: Policy, Trade & Gateway Economics, Volumes I & II*, Government of Canada, Vancouver, 2007.

<sup>3</sup> See for example, Lipsey, R.G., Carlaw, K.I., & Bekar, C.T., *Economic Transformations, General Purpose Technologies and Long Term Economic Growth*, Oxford University Press, New York, 2005. for an excellent current assessment of the factors that contribute to economic change.

- Technology, particularly information technology, is driving the value-added components of logistics by reducing frictions and increasing reliability along the supply chain. Global supply chains are about value-added logistics services rather than volume per se. *Delivered* prices (which include all frictional costs in the supply chain) are what motivates business decisions. Currently, competing delivered prices are subject to variability when comparing different gateway-corridor combinations, so that no one gateway-corridor is consistently preferred.
- The Canadian transportation network can compete and/or complement the system of gateways and corridors in the US. There are significant frictional costs on corridors within Canada (inter-provincial frictions) and between Canada and the US. The Canadian Federal Government is taking a system-wide approach to the transportation network while US policy appears to be more devolved to independent regional or local decision-making. A continental policy is what is needed.
- There is evidence that in the selection of transportation infrastructure investments, cost-benefit calculations can be subject to ‘optimism’ due to inaccurate forecasts and inadequate attention to the opportunity costs of resources required. After projects have been selected, regulatory friction can slow the implementation of infrastructure investments which can result in lost opportunities.
- There is no clear-cut solution to governance and regulation related to infrastructure investment in and operation of gateways and corridors. Public-private partnerships (“3Ps”) are subject to the transaction costs that accompany large asset-specific investments. Privatization can result in either over or under-provision of investment, depending on the accompanying regulation (cost-based, price-cap). There should be transparency and accountability in the governance of gateways and corridors. Government oversight should be coherent and consistent but must also allow for *flexibility* in commercial decision-making in order to promote dynamic competitive efficiency.
- The current impetus is to expand the capacity of gateways and corridors, however adding capacity does not guarantee social efficiency; congestion pricing is required. Congestion pricing has to be part of the equation if only because of the environmental impacts of growing global transportation networks – there is a need for international coordination here.
- All relevant social costs should be included when considering capacity investments in gateways, including security costs which are part of the social costs of network design and expansion. International comparisons of gateway and corridor expansions suggest that variations in urban and regional geographic and economic characteristics will create an uneven distribution of social costs and competitive advantages.
- There is evidence that small investments in corridors can cause big effects in the overall network. This suggests the possibility of non-linear relationships in transport networks (existence of threshold effects for example) and points to potential problems if infrastructure investments are made in isolation.
- Measuring port performance and pinpointing sources of efficiency is important for both commercial and governmental aspects of gateways. This is a difficult task though: different methodologies can provide different indications of performance.

The results of the Gateway and Corridor Research Initiative have shown that North America is often lagging its Asian and European competition for the traffic that moves through Gateways and Corridors

and more significantly for the global supply chains that exist across the Gateway-Corridor combinations. Not addressing these issues leads to a reduction in Canada's competitive position in world markets and directly affects our quality of life, income and employment expectations.

### **Value Adding and Value Streams**

Global supply chains emerged during the 1990s that created a decade of unprecedented economic growth worldwide. The falling costs of ocean transportation (containerization), communications and information have permitted industries in North America to take advantage of low cost labour in Asia and other developing countries. Levinson (2006) illustrates global supply chains with the example of the Barbie doll. Even a simple product like a child's toy can have a complicated value stream with components sourced and value added in China, Mexico and North America. The value stream is like a large river with a number of tributaries that are joined by transportation and logistics to deliver that final product to the consumer (Womack and Jones, 1996).

Three physical functions add value to a product as it is shaped and delivered through the supply chain to the retail shelf. They can be classified as time value, place value and form value. Form value for the Barbie doll is mainly added by the busy finger work in Asia that do the assembly and Mexico that produces her wardrobe. The origins of any value stream begin with the basic raw materials. The components of the Barbie doll may cross the Pacific Ocean twice during production, but the unit value at this point is relatively low. Most of the value-added occurs as the product nears its finished condition and retail distribution.

Time value is added by the communications and information systems that coordinate the assembly and delivery of the product to the hands of the consumer, when the consumer chooses to make their purchase. Time can be directly translated into money in the value chain. The less time it takes for the product to move through the production and logistics channels, the more efficient the value chain.

Place value is added by transportation, but the components of value go beyond simple movement. The value proposition of transportation has at least three subcomponents: freight cost, convenience and reliability. The cost of transport is always considered first, but a low cost service that is unreliable or damages the final product en route may deliver less value than a more expensive form of transport that meets customer expectations.

The combination of manufacturing (form value), inventory management (time value) and transportation (place value) are the value-added services of the supply chain that convert raw materials into finished products. The supply chain is comprised of multiple intermediaries that perform value-added services. It is a longstanding wisdom in logistics management that any intermediary can be eliminated; however the functions carried out by intermediary can only be shifted. If the functions can be performed better by a different intermediary then the value of the supply chain can be increased. Simply merging intermediaries however may not reduce costs or increase value.

### **Perspectives on Value-added**

Form, time and place value-added services accumulate as the finished product nears its point of final consumption. The measurement of value can be considered from several perspectives.

#### ***Accounting perspective of value***

The accounting approach examines the value chain from the cost side. The concept is familiar because of value-added taxes, such as the GST. Each business collects GST on its sales, and pays GST on its purchases. The value added by the business is the net revenue that is liable for GST payment. The

accounting approach makes no consideration of the efficiency or competitiveness of the value chain. Accounting merely documents where cost was added and assumes that cost equates to value.

### ***Marketing perspective of value***

Value is a subjective concept that lies in the hands of the individual consumer. The art of marketing is to match the price of the product with the consumers' willingness to pay. The price point is very important, but marketers also recognize that consumers are buying more than just the product value. They are also paying for the level of customer service that is delivered by the supply chain. Consequently, marketers are very interested in the value added by the reliability and responsiveness of the supply chain. An empty shelf is a customer service failure that provides no value added from a marketer's perspective.

### ***Operations management perspective of value***

The efficiency of the overall supply chain depends on how well it is managed to produce value. The intellectual breakthrough represented by "lean systems" has created a revolution in thinking about value. Rather than asking "what creates value", the question has been reversed to "what diminishes value". The answer to maximizing the value chain turns out to be relatively straightforward: eliminate *muda*, the Japanese word for waste. *Muda* is defined as any use of any resource that does not add value to the product. *Muda* can be measured in such terms as "unproductive waiting time", "unnecessary movement" and "production errors". The key to an efficient and valuable supply chain is to identify unnecessary *muda* and remove it from the system. A lean supply chain creates more value-added because higher efficiency reduces the cost of delivering the final product to the consumer.

### ***Policy perspective of value***

The public role in value chains is created by the need for security and the responsibility for the provision of transportation and communications infrastructure. The policy perspective places value on such macroeconomic variables as employment, investment and trade. Governments take responsibility for economic growth in their jurisdictions. Economic growth depends on continuous improvement and the expansion of the supply chains so the businesses in the jurisdiction can create value and remain competitive with other suppliers.

Transportation gateways and trade corridors are receiving more policy attention because they are critical components of supply chains. Moreover, they also create employment, investment and facilitate trade. For some commodities the value added by transportation and logistics can be greater than the origin value of the products. Examples, of this are raw products like sulphur and grain that are relatively low in value and heavy.

The policy perspective of value must also consider the broader impact of public services and infrastructure on traffic flows. The externalities of value chain activities, like noise, emissions, congestion and accidents may reduce the net value to society.

### **Value Definition**

Within the supply chain are a series of service suppliers and customers that each define value in their own terms. Ultimately, it is the mass consumer market that determines whether one supply chain delivers more value than another. Value has to be defined in terms of the whole product, and the final arbitrator is the consumer. Nonetheless, the individual intermediaries concentrate their efforts on delivering value to their immediate customers.

The myopic view of value within the supply chain is changing as intermediaries are forced to recognize that their actions can have more far reaching effects, but the process is slow. Heaver (2007) observes the activities of terminal managers at the ports as an example of this narrow view.

“It was not long ago that terminal managers in most countries viewed what goes on beyond the terminal gate as some else’s concern. ... While that view has arguably changed, terminals do not regard themselves as service providers with two sets of customers, those at the front door and those at the back door”

The terminals view the shipping lines as their front door customers where they get paid to create value. It is not clear that these intermediaries are concerned about the costs that their actions might impose on other parts of the supply chain.

It is surprisingly difficult to define value in supply chains. Arvis et al. (2007) created a worldwide Logistics Performance Index (LPI) as a means of comparing the competitiveness of trade services offered by different countries<sup>4</sup>. This index provides qualitative assessments of various aspects of efficiency and quality that are important to value creation, but do not define value or the value chain. Memedovic et al. (2008) expand on the drivers that increase the LPI such hard infrastructure, transport corridors, business environment, quality of logistical services and trade facilitation. They propose a Logistics Capability Index (LOCAI) to capture these measurable factors that explain value creation, but do not attempt to calculate LOCAI for any jurisdiction.

### **Public Role in Value Creation**

Public investment at gateways and corridors may be desirable from many perspectives, but does not necessarily create value in the supply chain. Investments in measures to increase safety and security, or reduce congestion at a gateway may be popular locally and easy to justify from a societal standpoint. A multimillion dollar investment that only cuts 15 minutes off a trip that takes 21 days to complete does not remove much muda (waste) from the value chain. The value added to the shipper or receiver of such investments are negligible relative to the value received by the neighbours that share the space of the gateway or corridor.

The services provided by government agencies, such as customs, may not provide any value to the supply chain, but are the necessary muda of international commerce. Clearly, the amount of muda can be reduced by improving the efficiency of such services, and in this manner add value. Similarly, the ability of government to create an inviting business environment can reduce risk and loss for the intermediaries. This also adds value.

From the “lean logistics” viewpoint, governments have great difficulty in creating value in the supply chain. Where governments can have an important role is in the elimination of waste. This can be done in two ways. First, those functions performed by government agencies can be streamlined to minimize unnecessary delay or conformity to arbitrary rules. Second, government can influence prices that provide signals to the supply chain intermediaries and use regulations where competition fails to generate appropriate price signals.

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<sup>4</sup> Referenced in: Memedovic, O., L. Ojala, J-P Rodrigue and T. Naula. “Fuelling the Global Value Chains: What Role for Logistics Capabilities?”, submitted for publication to Technological Learning, Innovation and Development, special issue on Global Value Chains and Innovation Networks, 2008.

## **Value of Gateways and Corridors**

Gateways and corridors are the locations where value added services are performed. No matter the sophistication implied by terms such as supply chain management, the physical realities continue to exist. Goods must be loaded and trans-loaded between different modes of transport, stored and tracked for import and export. Documents must be prepared and submitted to meet legal and fiduciary requirements. Attention becomes focused at geographic choke points like ocean ports because this is where congestion emerges and losses in value become easily identified.

Many value streams compete for access to gateways and corridors. Export and import traffic vie for space at the container terminals. Containerized terminals and associated intermediaries require physical space as do bulk terminals. Railway rights of ways interact with road systems. All these competing interests are affected by external influences of weather and seasonal traffic demands. Moreover, the commercial interests of the gateways are challenged by the residential interests of the population that co-exists in the limited space available. Value creation in the gateways and corridors is complex and requires strong leadership. Development at the gateways is driven by many competing interests. Effective leadership that foresees requirements and plans development is necessary to get all the interests to pull together.

## **Value Creation with Public-Private Co-Investments**

The multiple dimensions of value discussed earlier in this paper are conditional upon the existence of Gateway corridor combinations financed at levels to replace, renew and expand their essential freight infrastructure. For the most part, these investment requirements are well beyond the capacity of any individual government to finance. This is particularly true in Western Canada where infrastructure construction costs are now escalating annually in double digits.

It is no longer sufficient for the public sector to own and operate the gateway and corridor combinations that form the arteries of the global, continental, national and provincial freight movement systems. They must create the regulatory and market conditions to allow for cooperative public-private infrastructure planning and investment.

In the past, law and regulation required essential freight infrastructure to be either owned by the state (as in roads, ports and airports) or highly regulated by the state (as in railways). Privatisation initiatives over the past several decades have started to slowly restructure the ownership base of all four major modes (rail, air, water and road) but the financing and regulatory structures have not moved at the same pace.

Capturing value for the society and economy requires that the financing base for freight infrastructure keep pace with the changes underway in the marketplace, the economy and society. For a variety of contemporaneously legitimate reasons this has not happened. Infrastructure financing deficits have grown while new freight networks have simultaneously developed around the world to restructure through gateway and corridor networks the competitive position of regions and nations.

Public-private cooperation has now become an essential and growing requirement for many parts of the world to create the infrastructure necessary to finance the logistics and physical capacity that is the foundation for competitive advantage, transformative technologies and the new value added opportunities.

Public funding, in spite of a multi billion dollar federal infrastructure program, cannot inject the levels of funding required to meet the demands of logistics efficient and green freight systems. New cooperative approaches are required.

Canada has had some small progress on public-private partnerships for major infrastructure investments. Examples are to be found in the Confederation Bridge, Freight Highway 407 in Toronto and Edmonton's Anthony Henday ring road. These levels of development, however, remain far too small and slow to address the transformational requirements now required in the system.

A more comprehensive approach will be required to focus the levels of funding required to realize the full value for the Canadian economy and society and to compete with the rest of the continent and the world. Preconditions to stimulate these levels of funding would include;

1. Regulatory frameworks that allow the public and private owners of gateway and corridor infrastructure and their respective carriers to make market returns from their investments.
2. Modifications to federal/provincial Environmental Impact Assessment procedures on major projects to provide for timely decision making and affordable evaluations.
3. Public-private cooperation in planning that meets the needs of the design build engineering community and the requirements of the marketplace rather than the bureaucratic approval procedures of governments.
4. Development of a public environment that understands the rationale for public-private cooperation in infrastructure ownership, development and financing.

Investment in transportation reform through systems of gateways and corridors is a development activity that directly contributes to the competitive positions of regions, provinces, nations and continents and their long term growth prospects. The infrastructure investments can be seen as the foundation of the new logistics systems and a new *General Purpose Technology (GPT)* in the economy. As Lipsey notes GPTs: *will bring about extensive structural changes to such things as the organization of work, management of firms, skills requirements, location and concentration of industry, and supporting infrastructure.*<sup>5</sup> The conditions for public private investment can be seen as the essential enabler for societies, markets and industries to realize the full market value of their assets and to retain their competitive position in a rapidly changing marketplace.

### **Value Creation under Global Re-Structuring**

Global supply chains now link the developed and the developing world through new highly competitive gateway corridor network combinations. China, India, Eastern Europe and Mexico all become increasingly integrated into North American markets, creating immediate value for both shippers and carriers. Forecasts suggest a continuation of the trend if only to compete with competitors in Europe and Asia and will require a growth in North American freight traffic through gateway ports and along the corridors that connect the gateways to the inland retail, wholesale and manufacturing destinations.<sup>6</sup>

These developments, however, also represent a major restructuring of industry linked by highly efficient networks of gateway corridor combinations. This pan-national context has become the reality for the new competitive economic geography. For western Canada it can be seen as continental and pan Pacific. Such new networks offer important value propositions for many parts of the economy, but special challenges for the policy frameworks that enable them.

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<sup>5</sup> Lipsey, R.G., et al, Op cit.(2005) pps.10 -14.

<sup>6</sup> Deloitte and Touche LLP, Mastering Complexity in Global Manufacturing, London, 2003

Global supply chains founded on increasingly efficient transportation logistics have already created massive value for those engaged in the movement of the goods, particularly, through containers, but also for the consumers of the goods moved from the lower prices in the big box stores, now located throughout North America. The logistics efficiency and/or bottlenecks in the existing networks of gateways and corridors has also created many new value propositions related to the development of new transshipment points at tidewater or inland ports. Many of these are replacing traditional gateways that have become clogged through lack of investment or environmental and/or social conflict. Thus Portland supplements Vancouver for potash movements. Kansas City becomes a major inland redistribution centre. Canada has yet to fully exploit these developments, although ventures into small inland ports are already emerging throughout the Prairies and may provide the foundation for a range of related distribution, assembly and even manufacturing activities within Canada directly integrated within the global supply chains.

Continental networks can materially increase the level of competition available for shippers with material improvements in conditions of service, including price. Continental networks of movement increase competitive options. Transport policies based on local or even national dimensions lose this critical dimension of a competitive economy. Thus closed borders will reduce the number of competitive options available to shippers, while open borders will increase them. Thus by definition national transport policies will be less competitive than continental transport policy frameworks that can contain more carriers and competitive routings. While global restructuring has been systematically ignoring borders, transport policies in North America have not been able to create significant levels of continental cooperation, with direct and adverse consequences for the value proposition.

It is important to comment on the potential for lost value that can accompany a lack of attention to these continental trends in freight movement. The Canadian west coast ports and the Prairies are now a major through route for movements to and from Asia and the U.S. Midwest directly competing with U.S. west coast ports. The continental through traffic can, and does, displace small volume domestic Canadian movements for many smaller scale Prairie shippers, particularly in the agricultural economy. These Prairie access issues can only be resolved in the context of increased access and competition assessed in the context of the wider continental movements.

The global value proposition may also see dramatic reform in the context of rapidly rising fuel prices that will increase the cost of overland movement. While there remain ocean economies of scale sufficient to offset many rising energy costs, movements on land will be more constrained. Long distance movement from road to rail can be expected and with them a continued geographic restructuring of distribution sites and related manufacturing and re-supply activities. This restructuring of activity, combined with greenhouse gas reduction initiatives, is likely to shift the restructuring towards greenfield sites and areas of “green” energy production. The “real costs” of congestion and logistics inefficiencies will have higher value in a carbon constrained world. Capturing the value proposition for Gateway Corridor combinations in global value chains will therefore become closely tied to the fuel efficiency of the mode and the redistribution locations.

## **An Example of the LEAP Program and Success of Singapore<sup>7</sup>**

Memodovic et al. (2008) provide a Logistics Performance Index (LPI) quality ranking of international logistics services. “According to the LPI, Singapore, a major global transport and logistic hub, ranks first, in tune with its role as the world [sic] largest container port.” This is not a surprising outcome, or one based merely on luck and location. Singapore has earned its leadership position by being an early-mover in the creation of value-adding gateways. This was accomplished by its innovative LEAP program that contains lessons for other global gateways.

The locally based enterprise advancement program [LEAP] was designed to encourage multinational enterprises to locate in Singapore and to perform value adding activities. The objective of the program was to transform Singapore into an advanced logistics, particularly e-logistics, centre as it saw the centers of manufacturing production shifting among countries in Southeast Asia. Singapore took the view that as global competition progressed the logistics industry in Singapore should focus on capability development particularly in the areas of being thought leaders, developing human capital and in IT.

LEAP was not initiated in isolation and there were an additional number of other programs including Industrial and Investment Incentives Program, Innovation Development Schemes, Accelerated Depreciation allowances, Double Tax deduction Schemes, Counter Trade Schemes, Oil Trader Schemes, International Trader Scheme, International Shipping Enterprise Scheme and Aircraft Leasing Incentive (See Goh, 2001).

LEAP was designed to have four developmental main thrusts; manpower skills development, business process improvement, technology capability enhancement and infrastructure development. It was initially launched in 1997 with an emphasis on private sector-government collaboration to create programs to enhance in a significant way the competitiveness and capabilities of Singapore’s logistics industry; this reflected the goal of hastening Singapore’s position as being the leading integrated global logistics hub.

The LEAP programs using the fundamental framework of public-private partnerships and careful incentive contracting have provided supportive government policies which compliment Singapore’s relative advantageous geographical location, strong trade facilitation, quality infrastructure, good connectivity of transport modes, and established production base. With the development of logistics services Singapore’s share of merchandise world trade has increased steadily doubling in the decade from 1986 to 1997 and somewhat less than doubling to 2006. The trade per capita (in \$US) in 2006 was \$107,000<sup>8</sup>; this extraordinary performance would seem to depend on a number of factors but the use of programs such as LEAP has lead to co-investments by large numbers of multi-national firms and certainly by 3PLs and integrated transportation firms such as FedEx, DHL and UPS.

What are the lessons Canada might learn from the LEAP experience and success? It is always with care that lessons are taken from city states such as Singapore which are penalized by neither the geography of Canada nor the distribution of responsibilities under the constitution. Therefore, it is not outcomes that are the lessons but rather the processes; how was it achieved rather than what was achieved. Examining the evolution of the LEAP program in a context of goals and objectives is central to understanding it success.

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<sup>7</sup> For the complete report see Gillen (2007)

<sup>8</sup> See <http://stat.wto.org/CountryProfile/WSDBCountryPFView.aspx?Language=E&Country=SG>

Singapore has built its success on among other things its favourable location as a transshipment centre in moving goods out of production centers in Southeast Asia to markets in Europe and North America. Canada's west coast boasts of its 'geographical advantage' as a gateway to North America; is geography enough? Singapore realized that with the changing terms of trade in Southeast Asia and changing nature of supply chains, it needed to transform itself from transshipment to logistics and specifically to value adding logistics – in 2005 intra-Asian container movements were greater than trans-Atlantic and trans-Pacific container movements combined. *Lesson 1 – geography may be necessary but it is not sufficient for success. In an information intensive world location is no longer everything, lowest total cost trumps low location costs.*

The LEAP program levered government resources and relationships to induce investments by private sector firms through what were effectively public- private partnerships (PPP). Canada has certainly been actively engaged in using PPPs in advancing its own infrastructure agenda as well but Singapore has undertaken their PPPs in a way that allocates risk optimally and creates the right incentives for co-investments and efficient governance. Singapore has also had a focus on education and training. In Canada this has only recently emerged as a government initiative. *Lesson 2 –application of the PPP model also requires a change in governance to ensure excellence; specifically the PPP must be able to establish independence to attract high quality factors and be free of 'public' external pressures (a good example is the Canada Line PPP in Vancouver).*

LEAP 1997 focused on establishing the core infrastructure of both capital as well as knowledge. Singapore wanted to be a logistics hub of excellence and to develop its e-logistics business which required a transformation of conventional logistics processes through electronic means of moving, storing and manipulating data, information and knowledge. As a result private sector firms can deliver customer-configured products and value added services. In order to accomplish this Singapore through LEAP first undertook to study the issue, establish performance metrics and benchmarks to measure progress and success and to put in place the core infrastructure. *Lesson 3 – successful investment and management requires successful measurement to understand how and where progress is being made. Singapore understood the problem, they knew the direction they had to go and they could measure performance and outcomes of what they did.*

Examining the activities of LEAP 1999, the emphasis was on putting in place the information infrastructure, establish some standardizations and to continue to study the evolution of e-logistics. *Lesson 4 – core infrastructure investment is a prerequisite to successful deployment and the core capital must align with the goal of investments.* Singapore's goal was to increase value adding activities by building excellence in e-logistics. Canada is investing in roads and bridges to speed transshipment. *Lesson 5 – promotion of a gateway is essential in establishing presence and success in the market. LEAP 1999 invested in hub promotion, it takes time and resources to build economic relations with upstream markets; it is not a matter of build it and they will come.*

In LEAP 2001 the focus was on skills development and information technology ensuring knowledge capital would be available and would develop to meet the needs of the e-logistics hub. For skills development the investment was in education and in developing programs to ensure a continual supply of skilled labour. A second focus was on putting in place the IT that was complementary to expanding air cargo, including investing in an airport logistics port; this latter investment was a natural evolution from activities from 1997 and 1999 programs. *Lesson 6 – it is not enough to build roads and bridges, investment in skilled labour and education, including research, is essential to create high value added gateways. Singapore understands that strategic manpower and education programs are essential, Canada is investing in moving containers.*

Stepping back and looking at the evolution of the LEAP initiatives over time, there is a logical progression from building a solid foundation of core infrastructure which reflects the goal of LEAP. There was coordinated activity with investments that ensured there would be the delivery of service. The LEAP program was not simply about government business coordination as in conventional PPPs but in collaboration where there can be co-investments. A decision made by Singapore was to choose 'winners', that is industries on which to focus and promote which included chemical, biomedical, aerospace and cold supply storage. Choosing winners is a tricky business. The Canadian Federal government has said it wishes to focus its attention on 'volumes and values' of national significance. However, significance today may not be significant tomorrow; a lesson perhaps is if you are going to pick winners, you must be nimble and be willing to re-invent.

Facilities and firms can serve as strategic tools to link firms with each other and to the marketplace. Firms can have vertical linkages which allow value-adding activities up and down the supply chain. These activities can facilitate the flow of raw materials, components, parts and finished goods as well as information. Therefore, the key to the success of LEAP is the logical way in which the transformation of the logistics industry has taken place with an emphasis on skills and service development. In order to augment trade and develop value adding services, and not simply have freight flow through the port, the logistics sector must reduce cost and risk. It can accomplish this with tangible benefits in which service delivery, customer needs, operating costs, incentives and performance criteria are clearly outlined, documented, reviewed and improved. The logistics sector will naturally evolve towards 3PLs and move beyond traditional areas of warehousing, inventory control and transportation; each of these will become a vector of services by type to meet market needs.<sup>9</sup> *Final lesson - The evolution to e-logistics from conventional logistics requires thought leadership and a continual investment in research, human capital and skilled manpower and information, not simply physical infrastructure.*

## Conclusions

We conclude by offering a few thoughts based on the issues as summarized above. First, the evolution of global businesses and supply chains and the realization that value is created by developing reliable and cost efficient transportation networks should give us pause for thought. The successful development of gateway-corridor-hub networks depends crucially upon focusing on those elements that create the most value (both private and social). Many marine ports and airports around the world are expanding physical capacity and are positioning themselves to compete for cargo or passenger volumes. It is not clear that this alone will generate value – certainly not for all competitors.

Second, the interface between multiple levels of government and the private sector creates a complex problem for governance, regulation and oversight. Creating the right (social) incentives requires transparency, accountability and measurement. The objectives of creating efficiencies and competitive advantages favours the commercial business focus found in the private sector. With respect to gateways, the danger lies in overarching regulation and the application of common legislative rules to marine ports and airports, which differ significantly in size, geographic market boundaries.

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<sup>9</sup> For example, under transportation, the following services are being provided: LTL, refrigerated transport (reefers), container drayage (for shipping), flatbed delivery (rail), liftgate delivery, appointment delivery, freight consolidation, EDI (billing), dedicated trailers, and pooled distribution. In short, the core services expected are continually being augmented by other logistics related functions.

Public investment is needed to upgrade and sustain the transportation infrastructure of gateways and corridors. The pinch points are easily identified. The challenge is to set priorities and fund improvements that create the most value for the supply chains. At least one part of Canada's system-wide strategy should be to develop human capital capable of creating the information systems and computer-driven technologies that will be in global demand as the means to improve supply chains and lower transportation costs. To increase our human capital in this area requires an investment in education programs to develop both technical and management expertise in transportation logistics and supply chains.

### **Fundamental Questions in Shifting focus from Volume to Value in gateway and corridor policy.**

Possible Questions to be raised at this point are:

1. How can the public regulatory frameworks be modified in support of more efficient freight logistics systems?
2. Can the 3P model be streamlined to widen its application across the transport network?
3. Are local, provincial and even national transport policy frameworks still applicable in an era of continental and global corporate structures and freight movements? At the very least is it time for a continental transportation policy framework under NAFTA?
4. Can capacity and technology investments be combined to create a general purpose freight movement technological adaptation of lasting benefit to the economy?
5. How can incentive contracts be structured to induce adjacent firms in the supply chain to internalize externalities? (for example, shipping lines have little direct interest in quality of gate service, or in keeping costs low).
6. How will the new gateway and corridor logistics systems be affected in a carbon constrained world and the new climate change frameworks? Will there be new investment and value added opportunities created?
7. How should gateway performance be benchmarked and measured to determine whether sufficient value is being added to sustain corridor competitiveness?

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