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Gateways, Corridors and Strategic City Pairs

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Introduction

Advances in transportation technology mean that topography matters less, but trade routes continue to favour the paths of least resistance. The location of gateway cities and distribution hubs exhibit patterns of hierarchical systems. A change in technology that alters location advantage heightens corridor competition, and in the longer term it may modify the relative positions of cities in the regional hierarchy. Changes in transportation technology during the 1850s and the 1950s that altered the barriers of time and space reordered trade corridors in these periods. As the 21st Century opens, the growing Asian economies are stimulating Pacific trade routes, and intermodal container shipping is causing a resurgence of railway opportunities for trade routes that are prepared to foster their development.

This paper examines the concept of gateways and corridors, and the importance that strategic city pairs play in taking advantage of transportation opportunities. Its purpose is to encourage discussion on the topic of trade corridor competition. The first section presents a conceptual framework for examining trade corridors. Subsequently, two examples of strategic city pairs and corridor competition are considered. The paper concludes with some thoughts on the role of strategic city pairs in the promotion of the Mid-continent corridor.

Gateways and Corridors

The concept of trade corridors came to prominence with the ISTEA version of the Highway Trust Fund (1991), and the signing of North American Free Trade Agreement (NAFTA) in 1994.ⁱ The ISTEA Corridor Program identified 21 corridors as eligible for improvement funding, while a second Border Program favoured trade port improvements. Cities throughout North America began to look at north and south corridors with renewed interest. Civic and state governments initiated meetings with their respective corridor counterparts, task forces were appointed, and coalitions were formed to examine trade opportunities and to apply for Federal infrastructure funds. A plethora of named trade corridors emerged of which 43 are now designated "high priority" in TEA-21 (1998).ⁱⁱ

It is unrealistic to expect all 43 high priority corridors to grow at the same rate. Macroeconomic influences, like NAFTA can favour one corridor over another and several trade corridors may compete through strategic coalitions to receive more than their share of the traffic. The formation of NAFTA gave a boost to the economies of Canada, the United States and Mexico and stimulated north-south

"No widely recognized or utilized description or definition of corridors exists. Although many studies utilize the term "corridor" very few actually define the term."

Artibise and Daniell (2000)

transportation flows. Trade within the NAFTA bloc doubled in the first ten years and Mexico joined Canada as the most important U.S. trading partnersⁱⁱⁱ. The greater volume of trade increased trucking and rail border activity and corridor traffic for north-south routes.

The study of trade corridors spans several disciplines. Geographers have a rich literature on land settlement patterns and trade networks. Historians have observed the rise and fall of dominant cities and explored the impetus for change. Economists have studied the role of costs, investment and markets in the competition between corridors.

The first step in any serious discussion of gateways and corridors is to define these terms. The literature review undertaken by Artibise and Daniell (2000) suggests that interest in trade corridors has not been matched by conceptual analysis. The definition of a trade corridor has proved elusive. This may be explained by the dual nature of a transportation network. Transportation seeks the easiest, shortest and lowest cost routes, while land settlement patterns determine the location of transportation markets. Trade corridors exist within this network of links and nodes. The cities are the nodes and the various competing modes of transportation infrastructure form the links. A trade corridor is any pathway that facilitates the movement of goods between two or more nodes.

Burghardt (1971) developed a model of a gateway city that provides a useful framework for the consideration of trade corridors. The Burghardt hypothesis rests on the location and role of cities within a hierarchy of different sizes and functions. Just as larger cities have the economies of scale to provide services like appellate courts and specialized education that smaller cities cannot, at the very pinnacle of the hierarchy are cities that host national and international financial services and entertainment industries. These cities also dominate commerce as the largest centres of distribution to the lesser communities in their hinterland.

Dominant cities are often referred to as transportation hubs because all major roads radiate from these centres to their circular-shaped hinterland. Burghardt observes that large cities that lie at the extremes of the geographic regions behave differently than the hub cities that are situated in the interior. The hinterlands of gateway cities are cone-shaped rather than round. The one-sided hinterland is caused by their location at a geographical shear zone or other barrier to trade. Trade is funneled through the gateway city because it sits at a strategic location where transportation costs can be minimized.

Figure 1 identifies the role that hubs and gateways play in trade corridors. Hubs could rest on two or more major corridors that bisect its hinterland, while gateways are likely to serve only one major corridor. Hubs also have more short spokes that radiate in all directions. Gateways have few spokes and are more dependent on long corridors that feed traffic in and out of their region.

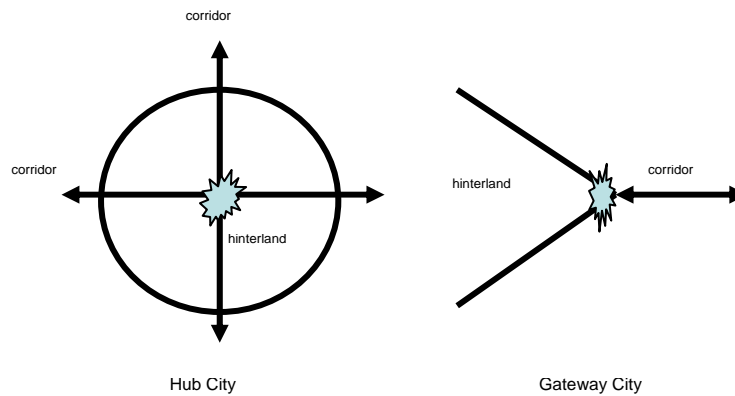


Figure 1 Model of a Hub and a Gateway City

Ocean ports are the most obvious gateway cities because they lie at the transition between a fertile hinterland on the one side, and an “infertile” sea on the other. Internal gateway cities can also emerge where continental features create the right conditions. For example, gateway cities can become located because of mountain ranges, deserts, rivers and inland seas. In the Mid-continent corridor, Monterrey, Mexico owes its location and size to the pass that provides a relatively gentle access for the railway through the Sierra Madre Oriental to the central plateau. Winnipeg, Manitoba sits as a railway gateway between the barren Canadian Shield to its east and the fertile prairies to its west. The exact location of Winnipeg at the forks of the Red and Assiniboine Rivers has been a meeting place dating back 5,000 years (Prentice, 1996).

The size of the region and the range of available transportation services help define the hierarchy of trade corridors. Ocean ports continuously compete with each other to attract shipping lines, airport operators compete to attract airline services, and cities work to provide surface infrastructure that serves their ports, railway yards and intermodal facilities.

Roads and rail lines are fixed and corridor specific. In North America the railway infrastructure is oriented with stronger and more direct east/west corridors than north/south corridors. Even in the case of air travel, which is not tied to fixed infrastructure routes, it is generally easier and faster to fly east/west in North America than to travel north/south. This reflects another source of gateway location: political boundaries.

Political boundaries create gateway opportunities because goods and carriers must stop for documentation, inspection and travel approval. Sovereign states also impose regulations that limit foreign competition (cabotage restrictions) and favour the transfer of goods to domestic transportation systems. Like seaports, sovereign borders

within a trading bloc stimulate land settlement patterns and employment to serve international trade. The cities of Laredo, Texas and Nuevo Laredo, Tamaulipas are excellent examples of politically created gateways that thrive on service activities brought about by border bottlenecks (Prentice, 2001)iv.

Traffic density is important to all transportation systems. A trade corridor can comprise many hubs and gateways, as presented in Figure 2. The model is general, but like the hierarchy of cities, a hierarchy of trade corridors exists. The more traffic originated at or destined for communities located along its route, the more important the corridor is likely to be in the hierarchy.

The framework for comparison of corridors provided by Artibise and Daniell provides a ranking based on four features of functionality: safety, intermodality, efficiency and environmental functions. This ranking of corridors in British Columbia is logical and consistent with casual observation, but the weights are subjective. The Artibise-Daniell criterion could be improved by consideration of hinterland size and corridor length. The two most important corridors in British Columbia must connect with the Vancouver gateway because it sits at the top of the regional city hierarchy.

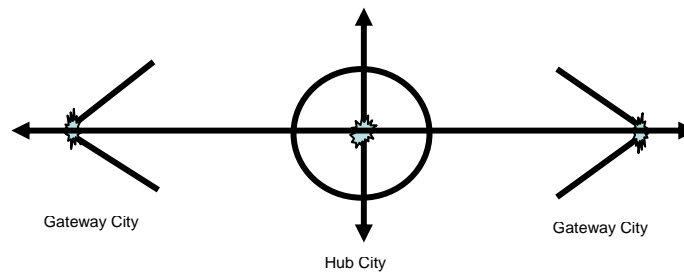


Figure 2 Hub and Gateway Corridor Model

The role of airports in the development of trade corridors is under researched. Clearly, in a passenger sense international airports are more important gateways than domestic airports. However, airports require no special geographic setting and need not be connected with any corridor to function. The degree of air passenger connectivity could be a significant measure in the placement of corridors within a hierarchy. Inter-city travel could be considered a proxy for business relationships and an indication of strategic alliances.

Moving the focus of the corridor analysis to a continental scale provides a framework to consider the competition between alternative routes and gateway cities. If geography and population density were all that mattered, discussion of trade corridor competition could close at this point. History teaches however, that creative genius and bold leadership also influence development, moving some cities up in their hierarchy, while causing others to experience relative decline.

Strategic City Pairs

Not much has been written on the concept of strategic city pairs and the role of technical change in the competition between trade corridors. This section presents case histories to consider this issue. The discussion begins with an examination of the competition between St. Louis and Chicago at the mid-19th Century. This is compared to the competition between Winnipeg and Calgary in the last quarter of the 20th Century.

Chicago versus St. Louis

Transportation technology changes can have a profound influence on trade corridors. Cronon (1991) sets out a detailed and fascinating history of the rivalry between St. Louis and Chicago and their respective trade corridors. The advantages of river transport ensured that St. Louis would be the dominant gateway to the west prior to the railway. By the mid-point of the century St. Louis had a population of 78,000 and was the second largest U.S. port. in terms of tonnage. Despite the early head start, St. Louis was overtaken by Chicago in a matter of decades following 1850, and has existed in its shadow ever since. A driving force behind Chicago's metamorphosis was technological improvement and extension of the railway transportation.

<u>Date</u>	<u>St. Louis</u>	<u>Chicago</u>
1830	4,977	100
1840	16,469	4,470
1850	77,860	29,963
1860	160,773	112,172
1870	310,864	298,977
1880	350,518	503,185
1890	451,770	1,099,850
1900	575,238	1,698,575
1910	687,029	2,185,283

The St. Louis corridor was actually a trade triangle with New Orleans and Philadelphia located at the other apexes. The rival Chicago corridor was an east-west link with New York City via Buffalo and the Erie Canal. The cost of seasonal lake shipping (April to October) and the transshipment through the canal were no match for the free current of the Mississippi river and year round ocean transport. Small steam boats arrived at St. Louis from the Missouri, upper Mississippi and Ohio Rivers for transshipment to large steamboats that would continue to New Orleans. Subsequently, goods would be shipped to Philadelphia, which was the leading city of the colonial era. Manufactured trade goods returned from Philadelphia to St. Louis via the Cumberland Gap and the Ohio River.

A question posed by Cronon is why St. Louis did not adopt the new rail technology before Chicago, when it was the largest trading and population center in the region. Many explanations have been proffered to explain the relative decline of St. Louis. Scorn has been heaped upon complacent business and government leaders, whose sloth or arrogant belief in the superiority of river transport blinded them to the threat of Chicago and the railway. Apologists point out that the Civil War and the economic devastation of the South had a much greater impact on St. Louis, than Chicago.

There is no single answer, but Cronon paints a different picture of this rivalry. He observes that Chicago business leaders worked with their counterparts in New York City to build and extend a connecting railway line cross the

northern Mississippi River, thus cutting off trade to St. Louis. They also succeeded in delaying the building of a rival rail link to St. Louis, so Chicago could establish a lead.

St. Louis's strategic partners were no match for the capital of the New York gateway. New Orleans was primarily an export port, without a strong financial presence, while Philadelphia had become more interested in its burgeoning local steel and coal industry. The St. Louis-New Orleans-Philadelphia corridor made only feeble attempts to win back traffic with some river improvements. By 1880, the Chicago-New York (CNY) corridor became the unsurpassed leader of the North American economy.

Toronto versus Montréal

The history of the rivalry between New York and Philadelphia has an interesting epilogue in Canada. After solidifying its base, the CNY corridor was extended north to Minneapolis that became the gateway to the northwest. The railway lines continued to head north, but never quite connected with Winnipeg before an east/west rail line was pushed through the Canadian Shield from the City of Montréal. Not only did the transcontinental railway secure the northern half of British North America for Canada, it made Montreal, the gateway to the country's predominant east-west trade corridor.

For Canada's first 100 years, Montréal was its largest city and financial capital. Winnipeg, which had been Montréal's strategic western partner since the canoe-based fur trade, expanded greatly under the impetus of rail transport. The western headquarters of Montréal's banks, railways, insurance companies, grain millers and other important institutions were all located in Winnipeg. Other western cities, like Calgary and Edmonton, grew in the hinterland, but Winnipeg remained the preeminent city on the Canadian prairies until the late 1960s.

FLQ (Front de Libération du Québec) terrorist incidents in 1970 and the election of a separatist government in 1976, triggered an exodus of corporate headquarters and English-speaking Montrealers to Toronto. The timing of the first separatist, Parti Quebecois government was extremely inopportune for Montréal, and its strategic partner Winnipeg. The oil price shock of the first OPEC oil embargo stimulated the linkage between Toronto and Winnipeg's western rival, Calgary. Had the financial headquarters remained in Montréal, the links with Calgary would still have been made because of its oil industry, but Winnipeg could have shared in the growth. Instead, a Toronto-Calgary partnership developed that saw western regional headquarters relocate from Winnipeg to Calgary. In 2005, Toronto is Canada's leading city and boasts the largest number of head offices. Calgary is number two in national corporate headquarters.

Over the past 40 years, Toronto eclipsed Montréal in the way that New York outpaced Philadelphia. Winnipeggers might empathize with the fate of St. Louis. Coinciding with the distracted interest of its strategic city partner,

Winnipeg lost its role as a dominant regional headquarters in western Canada and suffered three decades of chronically slow growth.

A critical turning point in history is a tempting explanation, but perhaps it is too facile. Political instability is the anathema of business, but a change in transportation technology was also affecting trade corridors in Canada, just like the expansion of the railway benefited Chicago at the expense of St. Louis. A hypothesis worthy of consideration is that the growth of long-haul trucking and the decline of the railway were as important to the Toronto-Calgary corridor's growth as any "separatist" fears. The railway had underpinned the Montreal-Winnipeg corridor, and determined that warehousing and distribution should follow this path. As long-haul trucking emerged, their competition undermined the economic dominance of traditional rail gateways.

During the initial growth of trucking in the 1950s, Winnipeg firms were among the first to take advantage of this opportunity (Heads, 1993) and the gateway became stronger. As transport trucks became larger and the highway system grew to be national in scope however, shippers no longer needed to distribute goods through Winnipeg. Shipping in truckload sizes with more reliable delivery windows enabled manufacturers and distributors in the industrial heartland of Eastern Canada to by-pass Winnipeg and go straight to competing cities located further west. By 1990, the Greater Toronto Area and Calgary became the two largest poles of distribution in Canada.

Implications for the Mid-continent Trade Corridor

Since NAFTA, Winnipeg has started to gain population and enjoy steady economic growth. A doubling of the province's trade with its southern neighbours has outpaced its trade with the eastern Canada. The identification of the Mid-continent Trade Corridor suggests opportunities for the development of new strategic partnerships.

The Mid-continent corridor connects a dozen cities between Mexico City and Winnipeg in a more or less straight line. These cities are well connected by highways, railways and air transport, in that order. It is interesting to observe the centers that have emerged to lead and encourage cooperative development of the Mid-continent trade corridor. Winnipeg in Canada and Monterrey in Mexico have embraced NAFTA trade opportunities and hosted several conferences and summit meetings. The participation of Winnipeg and Monterrey is logical given geography and sovereignty that leave no local competitors. Strategic leadership is more contestable amongst the U.S. cities of the Mid-continent corridor.

Burghardt identified many of the key cities of the Mid-continent Corridor as gateways during the frontier period of the Great Plains. Minneapolis, Omaha, Kansas City and Fort Worth all served as gateways to the western land settlement of their regions. As the economy of Great Plains region has matured these former gateways have taken on more characteristics of hub cities whose hinterlands abut each other, and the hinterlands of other cities like Oklahoma City, San Antonio and Fargo.

Initially, efforts to organize a coalition of cities to promote the Mid-continent corridor were driven out of Dallas-Fort Worth, which is the largest American city in the corridor. Leadership passed to Kansas City interests that continued to pursue the development of the corridor when their Texan counterparts turned to other opportunities. The business and government leaders of Kansas City have backed up their vision with creative efforts to develop a trade port and Mexico pre-clearance facility to secure a leading position.

Prospects for the emergence of a Winnipeg-Kansas City-Monterrey (WKCM) strategic city partnership is too broad for this paper, but perhaps a few thoughts are possible on the role of transportation technology change and the opportunities that it presents. For the purpose of this trade analysis, only cross-border movements between Canada, the U.S. and Mexico will be considered. In the Mid-continent corridor, modal choices are trucks and the railways.

Trucks versus Container Trains

The railways have three advantages in serving long haul NAFTA trade in the Mid-continent corridor. First, the railways are more energy efficient than trucks and a more environmentally benign mode of transport. The sticker shock experienced at the gas pumps in the aftermath of Hurricane Katrina is not going to end soon. The balance of world oil supplies and the growing demand of China and India guarantee that energy prices will operate on a higher plateau. Consequently, the cost advantage of the railways is likely to increase.

Second, the lack of cabotage rights within NAFTA affects the trucking industry more than the railways. The railways have lower operating costs that make empty backhauls easier to handle. Moreover, the railways do not have to be concerned with the immigration and employment rules that plague trucking.

Third, the Mexican border crossing is a much greater barrier to trucking than it is to double-stacked container trains. The failure of the U.S. to accommodate Mexican trucks in a manner comparable to Canadian trucks is a particularly obvious exception to the general success of NAFTA, and indicative of the general failure to integrate the trade of these transportation services. The railways are able to manage customs and equipment exchange with Mexico much easier than the trucking industry that has to exchange trailers or transload into foreign owned and operated trucks.

It is reasonable to expect that the future of NAFTA trade will favour double-stacked container trains. As railway gateways, Winnipeg, Kansas City and Monterrey can benefit from the change in transportation technology. Each of these cities offers distribution and routing advantages based on their historic role as rail gateways. The two Canadian railways interline service via the Kansas City Southern directly to Monterrey and Mexico City. The

problem is how to act upon this opportunity, so that NAFTA trade directed through the Mid-continent corridor has some benefit to the growth of its sponsors.

Unlike the case of New York or Toronto, the Mid-continent Corridor does not have an obvious capital need that will drive synergies. Moreover, the business and family linkages between these cities are relatively weak. Winnipeg, Kansas City and Monterrey do not even share direct air routes, which makes travel time much longer than for comparable distances east and west.

It seems inevitable that container shipping will capture more traffic and this could be used to advantage of Kansas City, if it were to become a transshipment points even for just Canada-Mexico trade. Thinking more broadly, Crowley (2005) points out that the capacity of the international container fleet will expand by 50 percent in the next five years. This is attributable to the surge of new post-panamax ships that are now capable of transporting over 9,000 twenty-foot equivalent units (TEUs). These ships can sail via the Suez Canal to reach eastern North America, or deal with the increasingly congested west coast ports, like Los Angeles/Long Beach. The third option is to open or expand secondary west coast ports. This is where Kansas City and the Mid-continent corridor have an opportunity to grow.

The Mexican ports of Manzanillo and Lázaro Cárdenas are becoming interested in this container traffic, as is the Canadian west coast port of Prince Rupert that is building new container facilities. These container ports could be served through Kansas City from the south by the KCS-TFM network and from the north by CN Rail. Although the rail distances would be longer than overland routes to existing US west coast ports, they could offer greater speed. This is particularly true of Prince Rupert that is 30 hours sailing time closer to Asia than any other west coast port. The idea of adding west coast ports to the Mid-continent corridor might seem to deviate from a north-south orientation, but the incorporation of ocean gateways would greatly strengthen its scope.

Concluding Comments

This paper opens a discussion of North American trade corridor competition. A trade corridor is defined here as any pathway that facilitates the movement of goods between two or more nodes. The nodes are a combination of hub and gateway cities that lie within a hierarchy of central places. The growth and prosperity of a trade corridor can be influenced by efforts create economic development. City leaders that create strategic partnerships to cooperate and coordinate efforts to compete for economic activity should be able to direct more trade opportunities to their networks.

The fortunes of a trade corridor can be affected by events outside its control. The development of a more efficient transportation system or the reduction of trade barriers can direct or divert trade from one corridor to another. The growth of containerization is the most dramatic change in transportation in the past three decades. The costs

of containerization have been falling because of larger container ships and double stacked container trains. The rising volume of containerized trade, in particular from China, has necessitated more investment in port handling infrastructure, and at inland rail terminals to handle the growth of equipment flows. As these facilities are built, containerization is being given a boost on all corridor routes.

It is interesting to note that competition can exist between and within trade corridors. The Chicago-New York competition with the Philadelphia-St. Louis corridor was between two parallel routes. The Toronto-Calgary competition with Winnipeg-Montréal was actually within a single major east-west trade corridor. Strategic alliances between cities played a role in the success of rival corridors. This lesson might be applicable in the Mid-continent corridor.

As major railway centers, Winnipeg, Kansas City and Monterrey have the opportunity to re-capture traffic that was largely diverted from the railways to long-haul trucks. The cities of the mid-continent trade corridor can capitalize on the growth of north-south trade that is being stimulated by NAFTA and the further integration of the North American economies. Nothing however, should be taken for granted. Changing transportation technology and trade liberalization can create opportunities, but it is the actions of the business and community leaders that influence whether their gateway takes the necessary steps to act on such opportunity or to let it pass.

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ⁱ In 1991, Congress enacted the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Public Law 102-240.

ⁱⁱ Transportation Equity Act for the 21st Century (TEA-21).

ⁱⁱⁱ Canada-Mexico trade is much smaller than either country's trade with the United States. Nevertheless, Canada is ranked as the second largest market for Mexican exports, and Mexico ranks fifth in terms of Canadian export markets. Prior to NAFTA however, Mexico ranked 15th in terms of Canadian exports.

^{iv} Burghardt observes that without the Canada-U.S. border, many of the gateway functions performed at Winnipeg could have been done at Minneapolis/St. Paul. The Twin Cities are still the largest urban centre in northwest North America until reaching the Pacific Coast.

^v If air transport is excluded, half the international gateways in British Columbia would be reclassified.