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NEW AGE OF TRADE: THE AMERICAS

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EXECUTIVE SUMMARY

Changes in the global trading environment have been a primary driver in the industrial real estate market for more than 20 years. Explosive growth in east-west trade from Asia (the world's fastest growing manufacturer) to the United States (the world's largest consumer) has had a profound impact on supply chain management and related real estate decisions. More trade has also meant more attention to supply chain strategies that expedite production and ease trade flows across borders.

This paper's primary focus is on regional trade and supply chain issues in the Americas. Fifteen years ago, the North American Free Trade Agreement (NAFTA) opened the doors, transforming the United States, Mexico, and Canada into one of the world's largest and most integrated trading blocks. Subsequent trade agreements between smaller trading areas (i.e. CAFTA) and individual nations have led to a further integration of the economies of North, Central, and South America. As well, the expectation of higher fuel costs, a global economic downturn, and the growing sophistication of "near-shore" markets are causing manufacturers and logistics professionals to take a closer look at supply-chain efficiencies that can be found within the Americas.

EXECUTIVE SUMMARY *continued*

This NAIOP-sponsored white paper by Cushman & Wakefield begins by exploring the macro- and microeconomic factors influencing production, trade, and supply-chain complexity in the region. More industry specific drivers such as erratic fuel costs, port development, the rise of the Caribbean, and the impact of trade agreements are subsequently covered in detail. The real estate impacts of such issues are also analyzed throughout the paper.

In part one of this paper, the macroeconomic framework of trade is put under the microscope. Findings include:

- Where trade was responsible for about 6.0% of GDP in 1950, it surged to 25% by 2007. The annual growth rate is staggering, about $120 billion a year.
- The North American Free Trade Agreement (NAFTA), signed in 1994, has contributed to an almost fourfold increase in trade between the U.S., Canada, Mexico and the rest of Latin America.
- The share of total trade has grown faster in the Americas than it has with Asia.
- Concerns about oil pricing are causing companies to reassess how far goods travel and by what means (i.e. plane vs. boat vs. truck vs. train).

In this section, we also acknowledge that the length and the depth of the financial crisis will alter business and supply chain strategies in the coming years. As a consequence, growth projections based on previous activity will be reassessed. However, given advancing technology, modern transportation, and growing consumer demand in emerging economies, a new age of trade is here to stay.

In part two, we look at major trends expected to have a substantial impact on supply chain management and warehousing in the coming years. Findings include:

- New routes to move goods to market more efficiently are opening up thanks to investments in ports and intermodal gateways. Small fast growing ports in Mexico (Lazaro Cardenas) and Canada (Prince Rupert) give shippers more alternatives and a new mix of inland hubs a promise of more activity.
- Well positioned inland cities that have made the necessary infrastructure investments in rail terminals and highways are becoming even bigger warehousing players.
- The widening of the Panama Canal and the emergence of the Caribbean as a transshipment center are expected to boost U.S. East Coast ports and markets in the coming years. The Caribbean's location along east-west and north-south trading routes makes it an ideal location for transshipment facilities.
- NAFTA not only increased trade but encouraged cross-border co-production of many goods. Further, an easy flow of goods across borders simplifies the management of many risks and variables (i.e. currency, labor, regulatory) for companies.

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PART I: THE ONLY CONSTANT

Dramatic changes in global trading have had a significant impact on industrial real estate in the Americas. Trade growth with the Asian block in general, and China specifically, has resulted in a tremendous increase in the flow of goods through ports in the Western United States. In 2007, China became the largest exporter of goods to the United States surpassing Canada for the first time in history.

While growth in trade between the U.S. and China has been extraordinary, it has nearly been matched by the expansion of trade between the U.S. and its Western Hemisphere trading partners. Starting with the North American Free Trade Agreement (NAFTA), enacted in 1994, trade reshaped and strengthened economic activity in the region and has had a tremendous impact on the U.S. industrial real estate market.

Sharp increases in oil prices in early 2008 brought renewed focus to trade opportunities in the Western Hemisphere. When oil was $40 per barrel, the cost of shipping from distant locations in Asia and other areas was more than offset by huge manufacturing cost advantages. Oil prices topped $100 per barrel in 2008 and ensuing price fluctuations have made transportation planning and spending management particularly challenging. Such issues have increased the attractiveness of locating manufacturing operations to closer markets in Central and South America.

The combination of longstanding regional business and economic ties, more open trade relations, and the close proximity of trade partners is positioning the Western Hemisphere as a growing source of goods for the U.S. market. This is influencing activity in U.S. ports on the Gulf of Mexico and East Coast, and will play a major role in the development of transportation and distribution systems for years to come.

TRADE AND THE ECONOMY

Globalization has been the key driver of the U.S. economy and trends in the industrial real estate market for the last three decades. In 1980, the U.S. imported $241 billion worth of goods for the entire year. In 2008, the same amount was imported in the first five weeks of the year. The net result has been a sharp increase in the contribution of foreign trade to the U.S. economy. Two facts underline the point:

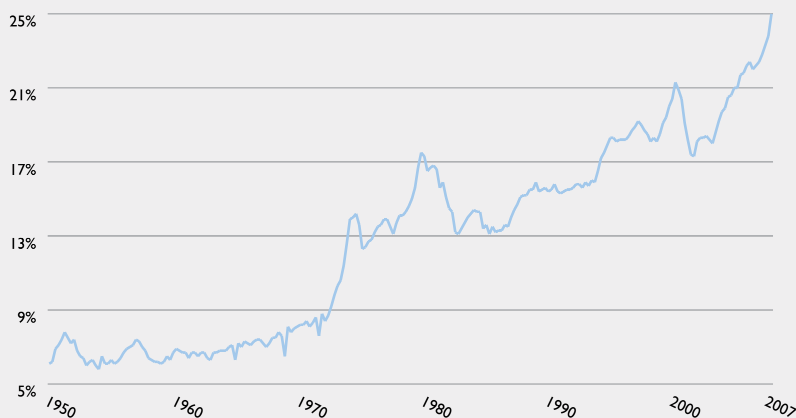
- In 1950, the total of exports and imports accounted for about 6% of total U.S. GDP.
- By 2007, that share had surged to 25% of GDP (see chart 1).

Most of this increase occurred since 1990, with total U.S. imports and exports adjusted for inflation more than tripling. This surge is attributed to several important developments in the early 1990s:

- China emerged on the world stage as an important producer of goods at low cost.
- The end of the Cold War created an opening of Eastern Europe and the former Soviet bloc.
- The implementation of NAFTA in 1994.
- The emergence of the Internet and other technology enabled manufacturers to source supplies and operate in markets anywhere in the world.
- Supply chain management became a critical function in the manufacturing process as producers sought to reduce costs while maintaining timeliness to market.

These developments triggered a new age of trade. Between 1994 and 2007, the volume of U.S. goods imported and exported, adjusted for inflation, increased by more than $1.5 trillion, or about $120 billion per year. This explosive growth transformed countries around the world, both established and emerging. Increasingly, the U.S. has become a service-based economy. In 1980, about 19 million people, roughly 21% of the American workforce, were employed in the manufacturing sector; by 2008, that number had dropped to only 13.4 million or 9.8% of U.S. workers.

Chart 1 | U.S. TOTAL EXPORTS AND IMPORTS AS A PRERCENT OF GDP



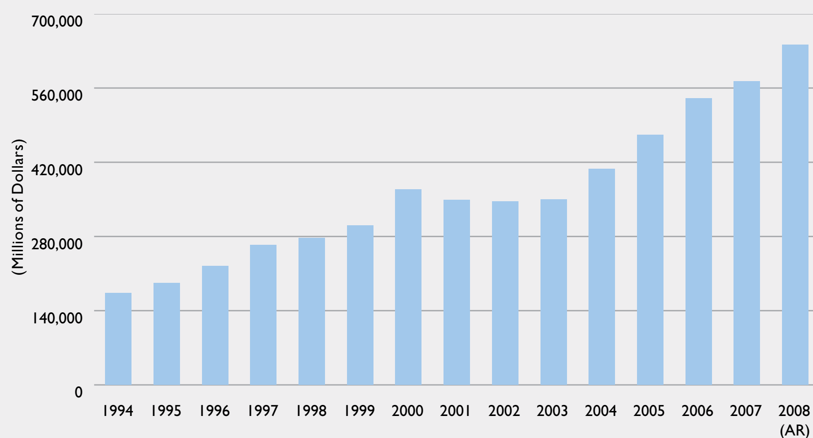
Source: U.S. Bureau of Economic Analysis

This shift has transformed the transportation and distribution landscape. In early 2008, the U.S. employed nearly two million more people in this sector than in 1982, an increase of more than 65%. Of course, such change directly impacted the marketplace for industrial space. In 1994 roughly 58% of the industrial inventory tracked by Cushman & Wakefield was made up of warehouse space and 29% was manufacturing (flex space accounted for the balance). Today, warehouses make up 66% of the total and manufacturing facilities only 23%.

THE EVOLUTION OF MODERN TRADE IN THE AMERICAS

Driven by the success of NAFTA, the U.S. moved steadily to open its borders with first Mexico and Canada, and then the Caribbean Basin. NAFTA's influence on trade has been huge. From 1994 to 2000, trade with Mexico and Canada increased by $314 billion, or nearly 12% per year. This staggering growth rate accounted for 38% of all U.S. import and export trade in those six years. In 2000, the success of NAFTA led to the U.S.-Caribbean trade pact that represents 19 countries and, according to the Office of the U.S. Trade Representative, "currently provides 19 beneficiary countries with duty-free access to the U.S. market for most goods."[1] There are also trade negotiations underway with several South American nations, including Colombia and Peru. While some face opposition, the trend is toward greater openness and lowering trade barriers in the Americas.

Chart 2 | U.S. TRADE WITH LATIN AMERICA (Total Trade, Imports Plus Exports)



Source: U.S. Census Bureau

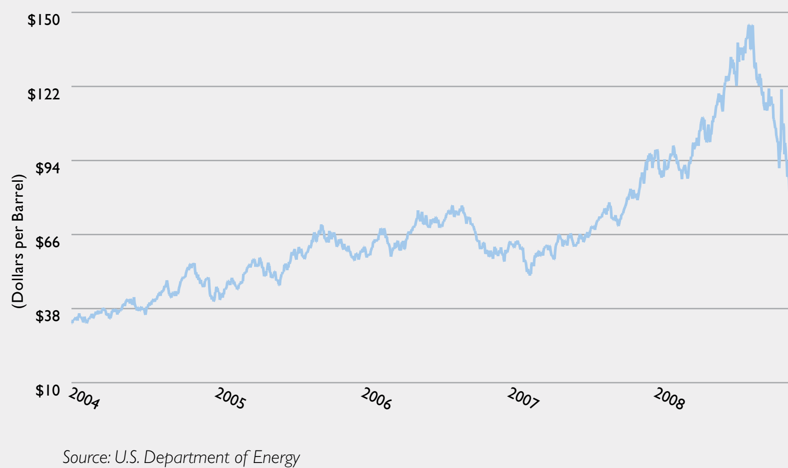
Statistics show the impact of expanded trade in the region: from $349.5 billion in 2003, trade soared to an annual rate of $641 billion in 2008, an increase of roughly 13% per year (To arrive at these totals, Cushman & Wakefield aggregated U.S. imports and exports with 39 countries in the Caribbean, Central and South America).

CHANGING GLOBAL TRANSPORTATION

The volitility of energy pricing is having a major impact on corporate sourcing decisions. In January 2007, oil reached $50 per barrel; by July 2008, it had nearly tripled to $145 per barrel. While prices dropped in October in the wake of the global financial services crisis, they will likely continue fluctuating for the foreseeable future. From 1985 to 2005, the average price of a barrel of oil was $24.11; in the past three years, it more than tripled to $81.45. Even with the declines in 2008, oil is far more expensive than it was in the 1990s or the beginning of the 2000s, and prices are expected to rise once the global downturn eases and demand increases.

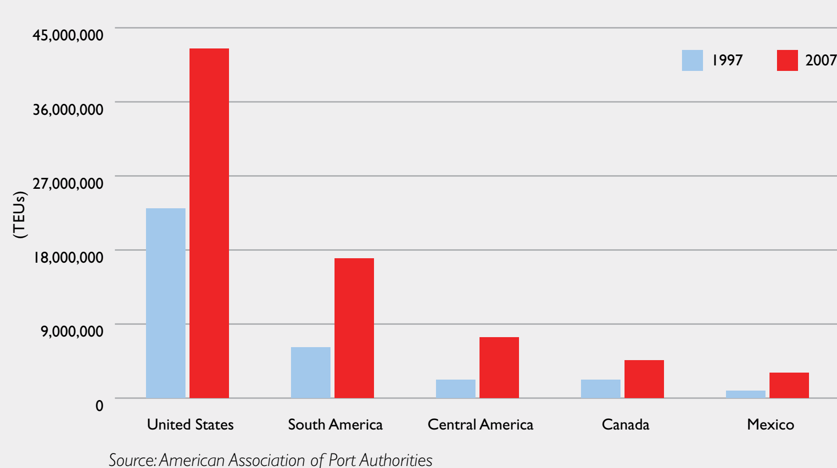
1. http://www.ustr.gov/Trade_Development/Preference_Programs/CBI/Section_Index.htm

Chart 3 | PRICE OF OIL



Source: U.S. Department of Energy

Chart 4 | SHARE OF TOTAL CONTAINER TRAFFIC BY COUNTRY/REGION



Source: American Association of Port Authorities

By extension, transportation costs as a whole will remain high. A May 2008 study by the Canadian Imperial Bank of Commerce (CIBC)[2] estimated that, in 2000, the cost of shipping a standard 40-foot container from Shanghai to the U.S. Eastern Seaboard was about $3,000 (Canadian) but, with oil prices at $140 per barrel, it jumped nearly three-fold to $8,000 in 2008 and, if oil prices reached $200, it would cost $15,000 to ship that container.

Transportation costs are key consideration in determining where products are sourced and can significantly offset labor cost advantages of many Asian countries. Distributors locating closer to markets also gain the advantage of reducing the time required to ship products, enabling suppliers to adapt more quickly to changing requirements. For these and other reasons, "near-shore" locations in Canada, Central and South America are increasingly being explored by manufacturers in their hunt for cost savings and productivity efficiencies.

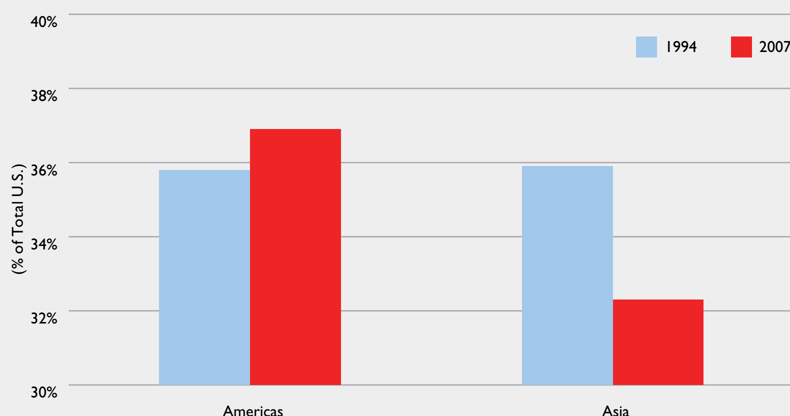
2. Rubin, Jeff & Tal, Benjamin, "Will soaring Transportation Costs Reverse Globalization" in CIBC World Markets StrategEcon May 27, 2008

TRADE WITHIN THE AMERICAS

The Americas as a whole traded 74.5 million twenty foot equivalent units (TEUs, i.e. truck containers) in 2007, representing an increase of almost 116% or 39.9 million TEUs since 1997. The largest volume increase in North America occurred in the U.S., which increased from 24.5 million to 45 million TEUs (+84.%). Yet on a percentage basis, Mexico led the way, up 239%.[3,4]

Since 1994, U.S. import and export trade grew significantly, but an important and largely unreported trend, is the growth in trade in the Americas. From 1994 to 2007, U.S. trade in the region increased at a faster pace than that with Asia, accounting for about 37% of total U.S. imports and exports, compared with 32.3% with Asia in 2007.[5]

Chart 5 | TRADE WITH UNITED STATES: AMERICAS VS. ASIA



Source: U.S. Census Bureau

U.S. port traffic patterns also reflect a shift occurring in trade patterns. The ports on the West Coast are largely focused on Asia, while those on the East and Gulf Coasts are focused on Europe and the Americas. Recent growth in the Gulf and East Coast ports reflects stronger ties to the Americas.

From 1991 through 2004, container traffic on the West Coast grew more rapidly than traffic on the East and Gulf Coasts, increasing from 51% of all U.S. container traffic in 1991 to 55% in 2004. However, in 2007, the West Coast share drifted under 55%. While it is too early to draw conclusions, a slowdown in West Coast port traffic growth may reflect a shift in trade flows toward Central and South America.

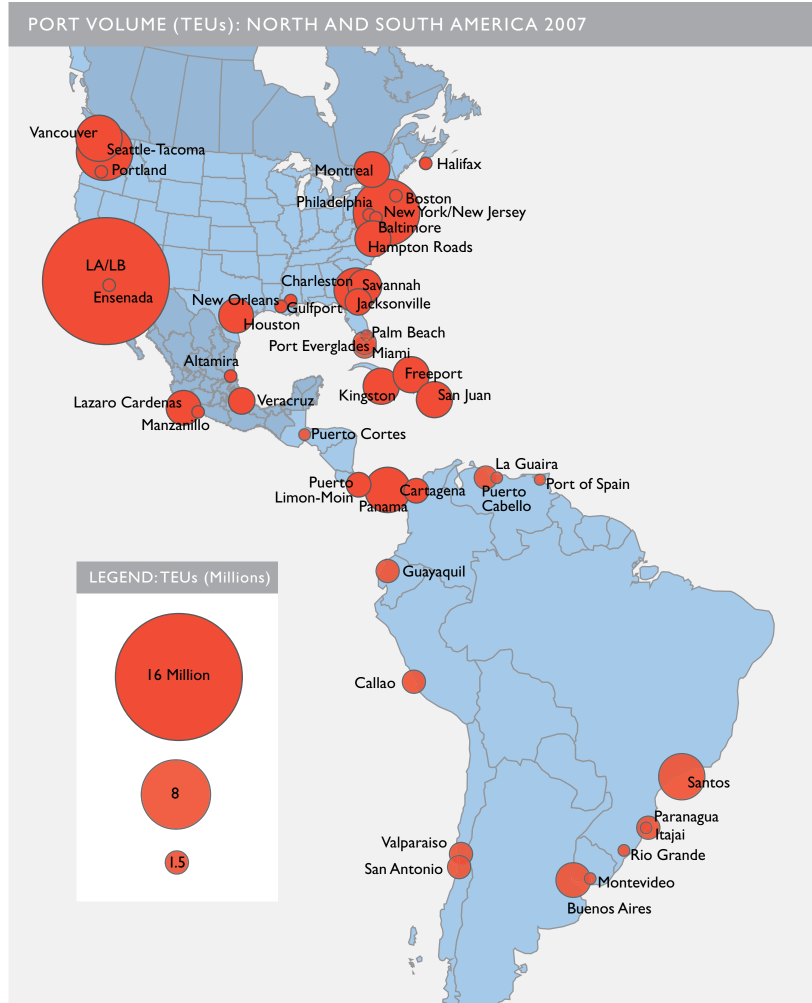
*Included countries: Afghanistan, Australia, Bangladesh, Brunei, China, Hong Kong, India, Indonesia, Japan, Korea, Macao, Malaysia, Nepal, New Zealand, Pakistan, Papua New Guinea, Philippines, Singapore, Sri Lanka, Taiwan

3. American Association of Port Authorities

4. Economic Commission for Latin America and the Caribbean (ECLAC); Agência Nacional de Transportes Aquaviários (Brazil); Autoridad Maritima de Panama; various port authorities

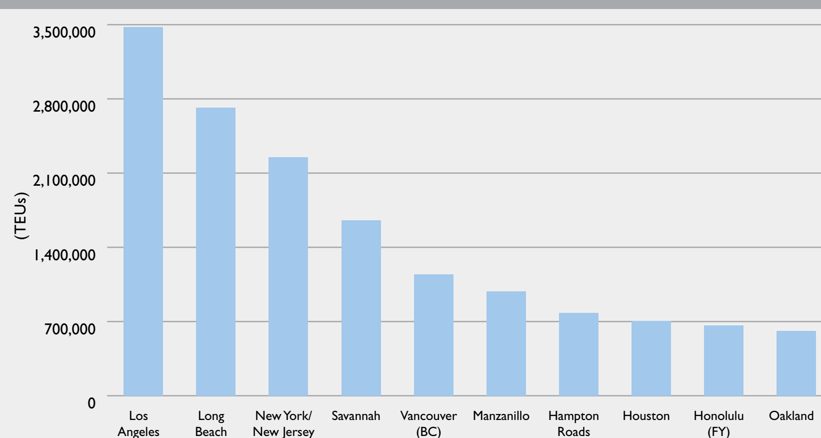
5. United States Census Bureau

PORT VOLUME (TEUs): NORTH AND SOUTH AMERICA 2007



Source: American Association of Port Authorities, ECLAC

Chart 6 | PORT VOLUME GROWTH: 2000-2007

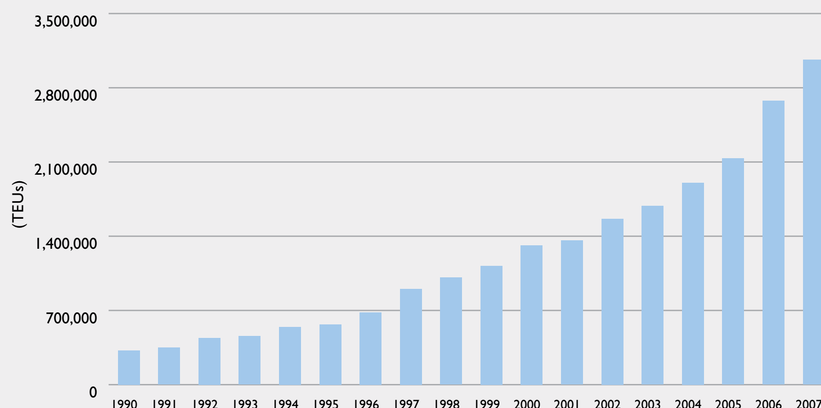


Source: American Association of Port Authorities

Another important trend is the move towards Mexico as a transshipment location. This development has led to strong growth in container traffic on the Pacific Coast of Mexico and a sharp increase in Mexico's overall container traffic. In 1990, Mexico only accounted for 2% of all container traffic in North America. Today, it accounts for nearly 6%. From 2003 to 2007, container traffic in Mexico surged 16% per year, far outpacing the 6.1% annual growth in overall North American container traffic. Much of the growth is occurring on Mexico's Pacific coast, where container traffic increased by 24% per year in the past four years.

The growth pattern is also reflected in U.S. ports. Although West Coast ports dominate U.S. traffic, those on the East Coast are among the fastest growing in the Western Hemisphere. From 2000 to 2007, total U.S. container traffic increased 14.6 million TEUs. While the major West Coast ports of Los Angeles and Long Beach reported the strongest growth, significant increases in

Chart 7 | MEXICAN CONTAINER TRAFFIC



Source: American Association of Port Authorities

container traffic were also experienced in the East Coast ports of New York, New Jersey, Savannah, and Houston. Since 2000, East and Gulf Coast ports accounted for 37% of the total U.S. growth in container traffic. That's less than the 55% that West Coast ports accounted for, but still very substantial growth.

CURRENT GLOBAL ECONOMIC CONDITIONS

In late 2008, the U.S. economy was gripped by both a recession and unprecedented global financial services crisis, which resulted in a global economic slowdown. The International Monetary Fund's World Economic Outlook (WEO) report predicted growth slowing to rates not seen since the 2001-02 recession, with gradual recovery beginning in late 2009 and global growth resuming sometime in 2010.

The WEO report predicted that world economic growth will drop to 3.0% in 2009, and that global growth in world trade volumes will fall from 4.6% in 2008 to 2.1% in 2009. This is in sharp contrast to the 2007 figure of 7.2%. With advanced economies, such as the U.S. and the U.K., suffering from a loss of consumer and business confidence, emerging economies, such as the BRIC (Brazil, Russia, India and China), are feeling the pain of decreased demand and investment.

The global economic downturn has had a direct impact on the demand for oil; from a high of $148 a barrel reached in July 2008, oil prices are predicted to hover around $63.50 in 2009 (Energy Information Administration: Official Energy Statistics from the U.S. Government). To offset the lower demand and stabilize prices, OPEC has lowered production levels. Should the global economy continue to regress and recovery takes longer than expected, fuel prices will remain low. However, other analysts argue that the moves taken by OPEC, coupled with the world's reliance on oil, will support higher prices.

Clearly, the downturn is impacting the entire global supply. After a decade of up to 15% growth, ocean trade growth is expected to be flat in 2009. The economy as a whole will begin to recover in late 2009 and into 2010, but at a very gradual rate. Consumer spending, a major driver of the world economy, is expected to remain restrained even as the U.S. regains its financial footing. Hence, explosive growth seen in the last decade is over for now, although gradual growth in global trade volumes is expected. Despite sluggish growth, trade patterns and the development of industrial markets will continue to evolve to support current and anticipated demand.

PART 2: SUPPLY CHAIN TRENDS & REAL ESTATE IMPACT

Change is really the only constant in supply-chain management. This section assesses some of the major factors that will impact supply chains – and industrial real estate – in the coming years. The focus is primarily on the Americas, with emphasis on the United States, Canada, and Mexico. Topics as varied as fuel costs, new investments in rail and port infrastructure, the widening of the Panama Canal, and the impact of NAFTA are analyzed with a view to identifying new industrial real estate opportunities.

TRANSPORTATION COSTS FUEL SUPPLY CHAIN REDESIGN

Increased transportation costs have caused many companies to question one of the most sacred of manufacturing strategies – just-in-time (JIT).

JIT strategies focus on inventory reduction by moving goods rapidly through the supply chain, resulting in more frequent, lower-volume shipments. JIT is considered to be a more "pull-based" supply chain that is reactive to small changes in customer demand. The increase in transportation rates caused many companies to analyze the cost-benefit of JIT, especially those that have assembly processes involving multiple locations and import items with the highest associated costs (heavy or bulky items). A move to a more "push-based" supply chain means higher inventories and more reliance on demand forecasting, but lower transportation costs.

Some companies are also reassessing their Asian manufacturing locations. Low wages and well-established supply-chain networks support sourcing from Southeast Asia, but the cost of moving those goods has many businesses looking for alternatives closer to home.

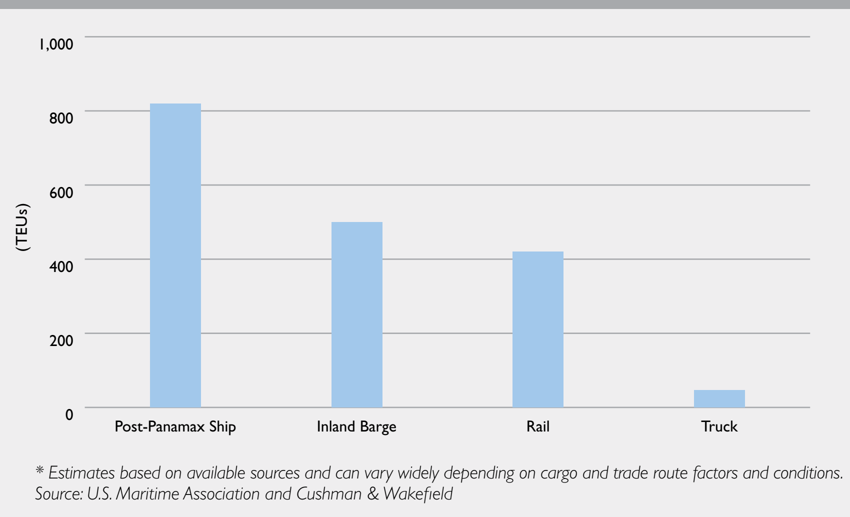
REAL ESTATE IMPACT

Near Sourcing

From a real estate perspective, Mexico stands to benefit the most from a high-cost transportation environment that forces companies to reassess the location of their production facilities. The country offers low-wage labor and direct access to the U.S. market. The border markets of Juarez and Monterrey have the most to gain, followed by Tijuana, Guadalajara, and Reynosa. The industrial Midwest, which has a strong manufacturing base, could also benefit. Parts of the Southeastern U.S. have been adept at attracting automobile production and other manufacturing, and will likely benefit from lower rates of union membership.

6. Moody's economy.com forecast of U.S. exports

Chart 8 | TON-MILES TRAVELLED PER GALLON OF FUEL*



Estimates based on available sources and can vary widely depending on cargo and trade route factors and conditions.
Source: U.S. Maritime Association and Cushman & Wakefield

The mode mix of shipments is also changing as shippers look to keep as much product as possible on the most efficient modes of transportation for as long as possible, which means maximizing rail and sea transport over trucking and air. Rail transport, which has traditionally been used for longer trips, is now being used for shorter hauls. While rail and sea tend to be slow, and are becoming slower due to conservation measures (slower operating speeds), they still offer significant savings. Recently, there has been discussion about short-shipping between Great Lakes ports, especially for high-volume, low-cost goods.

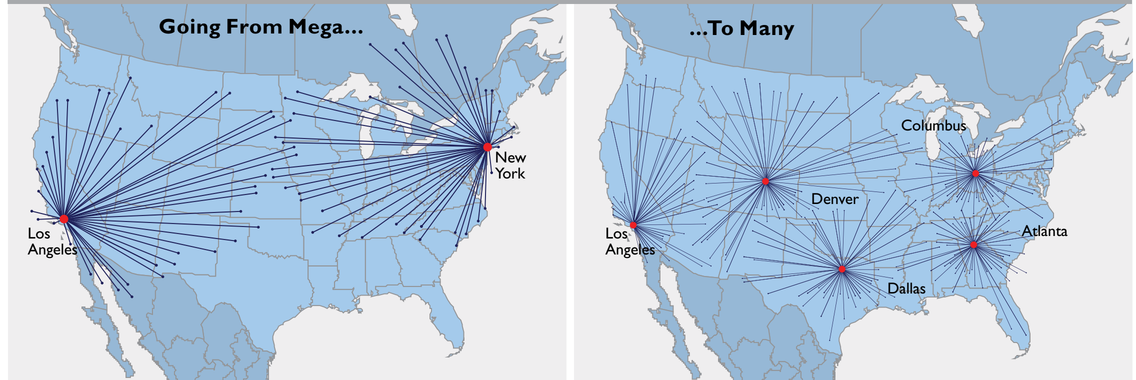
REAL ESTATE IMPACT

Mode Mix

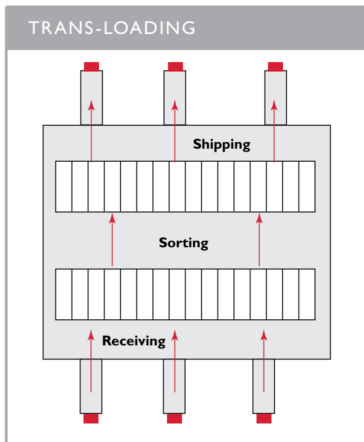
A move to lower cost modes of transport would benefit the largest ports and the inland hubs with the best rail access. Southern California and Seattle/Tacoma could see an increase in loads that are headed for the traditional inland hubs of Chicago, Atlanta, and Dallas via rail. A more sea-oriented approach would bring more goods through the canals – Panama and Suez – straight to the major East Coast ports of New York/New Jersey, Hampton Roads, and Savannah. Recent investments in intermodal hubs and rail routes could give some advantage to Kansas City and Columbus, Ohio.

In a higher transportation-cost environment, a mega-distribution center strategy that depends on a few very large distribution centers to serve the entire country may be less cost effective than a more integrated hub- and-spoke-model that relies on smaller facilities located closer to consumers. The idea is that small or partial loads, also called less-than-truckload (LTL), going to individual retailers and other businesses are guzzling more gas and are less efficient than the full truckloads to the distribution centers. In the long run, the cost savings gained through minimizing LTL trips offsets the additional expense of multiple, smaller distribution centers.

REDUCING SHORT-HAUL COSTS TO CUSTOMERS



TRANS-LOADING



This shift will likely benefit some of the better positioned second-tier markets; those that are not considered to be major players because they lack a port or a major intermodal facility. Further, close-in submarkets with the best access to consumers and businesses at the end of the supply chain are becoming more desirable because these locations offer the highest LTL to consumer savings. An added bonus is that these locations are much less likely to suffer from new construction than more peripheral locations.

A final strategy is the increased use of cross-dock facilities and transloading, which sees importers bring goods into transloading or consolidation facilities to be unpacked and then repacked with a mix of goods for further distribution. The time and cost of unpacking and repacking freight is offset by the efficiencies of bringing a full load of goods to the next distribution facility or to the retailer or other end-user. This strategy will benefit the largest ports and inland hubs with the largest share of through-trade activity; these hubs are also most likely to attract the volume and diversity of goods to make this strategy really pay.

REAL ESTATE IMPACT

From Mega to Many

Close-in submarkets could gain as long as congestion costs do not hinder the advantage of minimizing LTL distances. Smaller regional distribution centers like Denver, Charlotte, Portland, and Kansas City could see a net gain if companies decide that minimizing those last mile costs outweigh the efficiencies and cost savings offered by size.

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SURGING TRADE CREATES DEMAND FOR ALTERNATE PORTS

Ports, waterways, rail, and trucks - the backbone of the logistics chain - are going through major growing pains to keep pace with global demand. According to the American Association of Port Authorities (AAPA), U.S. ports and waterways handle more than 2.5 billion tons of domestic and import/export cargo annually, and that volume is projected to double within the next 15 years. But congestion and capacity concerns, in addition to infrastructure challenges and environmental issues, especially at the dominant Southern California ports, have hampered improvements and created inefficiencies at many West Coast ports. Also, with higher rail rates, these ports have been losing market share to Gulf and East Coast ports.

TRADE ROUTES

MEXICO: Surging international ocean trade has made Mexico's ports increasingly attractive to global shippers, especially for cargo originating from China and other Asian countries. The Los Angeles-Long Beach port facilities continue to handle about two thirds of the cargo arriving from Asia to the West Coast, but Mexican ports such as Lazaro Cardenas, Manzanillo, Veracruz, and Altamira are also recording rapid growth. Without room for expansion, U.S. West Coast ports lack the capacity to absorb the increase in Asian imports and it seems inevitable that they will lose market share to Mexico's ports. Along with significantly less congestion than California ports, Mexican ports offer a labor cost advantage, with wages less than one quarter of those in the U.S.

In 2007, expansion leveled off at the Southern California ports, while container traffic at Mexico's busiest port, **Manzanillo**, surged 13%. Although smaller than Manzanillo, **Puerto Lazaro Cardenas**' tonnage volume grew by 68% in 2007. This port has a key asset - its on-dock rail facilities are provided by Kansas City Southern de Mexico S.A. de C.V., which is a subsidiary of American railroad, Kansas City Southern. This linkage provides Lazaro Cardenas on-dock intermodal links directly into the southern U.S. as well as the shortest route to Mexico City. LCT's deep water harbor features a natural 59-foot draft, capable of handling the largest and most modern transpacific container ships.

REAL ESTATE IMPACT

Lazaro Cardenas

Puerto Lazaro Cardenas in Mexico may offer opportunities for Kansas City, which is making considerable investments in its intermodal capabilities, and has the land and public support for considerable growth. Generally, smaller ports like Lazaro Cardenas, are a long way from challenging the dominance of the Southern California ports, and have far less potential for distribution center growth due to small local populations.

PRINCE RUPERT, CANADA

LAZARO CARDENAS, MEXICO

Photo: Salvador Solórzano

Roughly 150 miles south of the U.S.-Mexico border, the Mexican government and global shipping officials are eyeing **Punta Colonet** as a proposed site to develop a 27,000-acre deep-sea port. Located on Baja's desolate Pacific Coast, this $4-billion project could transform this farming village into a cargo hub, becoming a strong competitor for Lázaro Cárdenas. If completed by 2014 as planned, the port would route Asian cargo through Mexico to the American heartland and would be built in tandem with a rail link that would carry containers from Punta Colonet to the U.S. border. Punta Colonet would initially process close to one million containers annually, with capacity to handle as many as five million after five years of operation, far surpassing the capabilities of Lázaro Cárdenas. The port would serve only containerized cargo ships, off-loading containers to railcars that would transport goods on a corridor integrated with existing lines at the U.S.-Mexico border. Currently, the development partnership is navigating legal and environmental issues and construction could take at least five years.

CANADA: The recently opened **Prince Rupert** facility, which is 540 miles north of Vancouver, is the first North American port designed exclusively for intermodal rail shipments, and is positioned ideally as a natural northern alternative to congested U.S. West Coast ports. The $170-million Fairview Container Terminal and new trans-Pacific container corridor is designed for intermodal traffic destined to Canada's heartland and to Chicago and Memphis. The new port facility has many advantages over other West Coast ports: it is the deepest natural North American port at 61.3-foot berth depth and the area's low population expedites car, truck, and rail transportation.

REAL ESTATE IMPACT

Prince Rupert

Prince Rupert's impact will be felt most in Chicago, Memphis, and Toronto, all of which are well connected to CN's rail network and have long track records for receiving such freight.

Warehouse development in Prince Rupert will likely be limited to storage and consolidation facilities for incoming and outgoing freight.

The opening of the Fairview Container Terminal and strong performances by Ridley Terminals and Prince Rupert Grain resulted in tonnage volumes through Prince Rupert increasing by 37% in 2007. In contrast, the combined tonnage volume through the Southern California ports was relatively flat in 2007. While questions exist about the future of Southern California as a freight gateway, Prince Rupert was designed to attract container flows. The port is part of a visionary Canadian Asia-Pacific Gateway and Corridor initiative aimed at improving overall trade and transport links to Asia. The initiative, backed by $600 million in public funding and nearly $6 billion in private investments through 2010, involves rail, port, and airport facilities. The development is expected to boost container traffic at British Columbia's major ports by at least seven million units annually by 2020, increasing Canada's share of West Coast container traffic from 9% to 14%.

INTERMODAL INVESTMENTS CREATE NEW INLAND HUBS

Increased trade volumes and the need for greater efficiency in transportation have spurred the development of intermodal facilities throughout the U.S. The future of rail is predicted to be highly dependant on these facilities due to the increased international container volume, specifically from Asia. The efficiencies of distributing merchandise from a rail logistics hub are expected to compensate for the higher intermodal rail costs involved in the move (railroads increased intermodal rates in early 2008 by 20% to 40%).

While **Chicago's** dominance as an inland hub will remain unchallenged, a number of regions are expected to experience a surge in warehousing development due to intermodal activity. In preparation, such markets are all making significant public and private investments in roads, rail, and intermodal terminals.

MAJOR DISTRIBUTION HUBS*

National	Regional	Local
St. Louis	Baltimore	Austin
North-Central New Jersey	Charlotte	Boston
Memphis	Cincinnati	Fort Lauderdale
Los Angeles	Cleveland	Hartford
Inland Empire	Denver	Honolulu
Indianapolis	Detroit	Las Vegas
Dallas - Fort Worth	East Bay	Long Island
Columbus	Houston	New Orleans
Chicago	Jacksonville	New York
Atlanta	Kansas City	Norfolk
	Miami	Oklahoma City
Toronto	Milwaukee	Orlando
Mexico City	Minneapolis	Palm Beach County
	Nashville	Pittsburgh
	Orange County	Raleigh
	Philadelphia	Richmond
	Phoenix	Sacramento
	Portland	San Antonio
	Salt Lake	San Diego
	Seattle	San Francisco
		San Jose
		Savannah
	Vancouver	Stamford
	Montreal	Tampa
	Monterrey	Washington - NoVA-MD
		Calgary
		Edmonton
		Juarez
		Tijuana

** Based on weighted transportation, industry, and labor force measures*
Source: Cushman & Wakefield (Canada & Mexico), Property Portfolio Research (U.S.)

As an inland hub, Dallas is especially well positioned with two major multimodal transportation centers. Located just 12 miles from downtown Dallas, the 360-acre Union Pacific Railroad's Southern Dallas Intermodal Terminal (DIT) is designed to support growing intermodal volume in the region. Adjacent to this site, the Allen Group is developing the **Dallas Logistics Hub,** which is the largest new logistics park under development in North America, with 6,000 acres of land and the potential for 60 million square feet of distribution, manufacturing, and retail development. This master-planned logistics park is adjacent to four major highways, dual rail, intermodal facilities, and a future air-cargo airport. The Dallas Logistics Hub will receive products

SELECTED PORT TO HUB TO MARKET CONNNECTIONS

from the ports of Los Angeles, Long Beach, Houston, and new deep-water ports in western Mexico and will compete with the older development 40 minutes northwest of downtown Dallas.

The 12,000-acre **Alliance Global Logistics Hub,** which opened in 1990, is one of the world's premier inland ports, providing exceptional accessibility to the global marketplace. With access to all modes of transportation, the hub boasts two Class I rail lines, BNSF Railway's Alliance Intermodal Facility, and connecting state and interstate highways. This area is home to Fort Worth Alliance Airport - the fifth fastest growing airport in the world and the world's first dedicated industrial airport - and the FedEx Southwest Regional Sort Hub. Alliance Global Logistics Hub is home to more than 200 companies, including 65 from the Fortune 500, Global 500, and Forbes' List of Top Private Companies and is a Foreign-Trade Zone (FTZ).

REAL ESTATE IMPACT

Rise of Rail

Railroads will continue to deliver tenants to the largest inland logistic hubs like Chicago, Dallas, and Atlanta, and will have an even bigger role in the coming years in secondary hubs like Kansas City, Memphis, and San Antonio. Dallas and Kansas City have tremendous near-term growth potential due to very large and well-publicized investments in intermodal cargo facilities.

Located in the heart of America at the hub of the transcontinental and NAFTA trade corridors, the Kansas City area is also emerging as a major inland port solution. In 2007, **Kansas City** transferred ownership of more than half of the former Richards-Gebaur Air Force Base near Belton to Chicago-based developer CenterPoint Properties, which plans to develop about 970 acres of the 1,350 acres into a $200 million logistics park that will target freight from Mexico. Within ten years, the company, which already has a successful track record with intermodal facilities in Chicago, plans to build more than five million square feet of warehouse and industrial facilities. This project is just one of three new intermodal developments coming online in the Kansas City area, along with developments at the Kansas City International Airport and BNSF's 997-acre logistics hub in Gardner. The Allen Group plans to develop about seven million square feet of speculative warehousing and distribution facilities on 579 acres and BNSF will keep the remaining 418 acres for its intermodal facility, planned for a 2009 opening. Logistics Park-Kansas City will be BNSF's third logistics park project of that size.

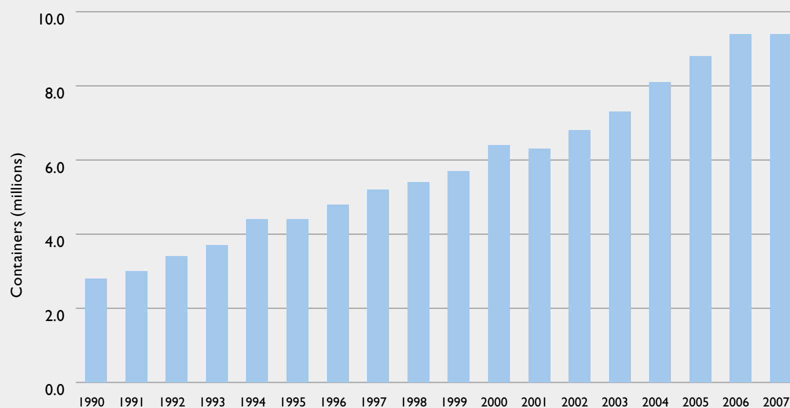
REAL ESTATE IMPACT

Heartland Corridor

The largest industrial markets of Virginia, West Virginia and Ohio located along the Heartland Corridor, which extends from Norfolk to Columbus, can expect a healthy increase in demand for warehouse space from new businesses seeking access to the ports.

The completion of the **Panama Canal** expansion project in 2015 will bring more and bigger ships to the Gulf and East Coast ports. However, with the exception of Houston, Gulf ports do not have the infrastructure in place to handle significant intermodal traffic. Most intermodal infrastructure investments are located on the East Coast, with the largest exceeding $450 million for the APM Terminal in Portsmouth, Virgina. The terminal's initial capacity is one million TEUs but is expected to expand to two million in the future.

Chart 9 | U.S. RAIL CARGO TRENDS: CONTAINERS ORIGINATED



Source: American Association of Railroads

Construction also commenced on the **Heartland Corridor** project, which will reduce the current rail route between the Ports of Hampton Roads, Virginia (Newport News, Norfolk, and Portsmouth) and Columbus, Ohio, by nearly 200 miles, creating a seamless, efficient intermodal rail route to Chicago and other major Midwestern markets. The project calls for increased height clearances on the 28 tunnels along the route as well as a combined construction and expansion of three intermodal terminals where cargo is transported between rail and truck. The expansion of these terminals is expected to facilitate economic development in the cities where the terminals are located by increasing their exposure to international trade. In addition, the double stacking of containers will provide a cost-benefit to businesses utilizing the route as two containers can be shipped for the same price as a single stack.

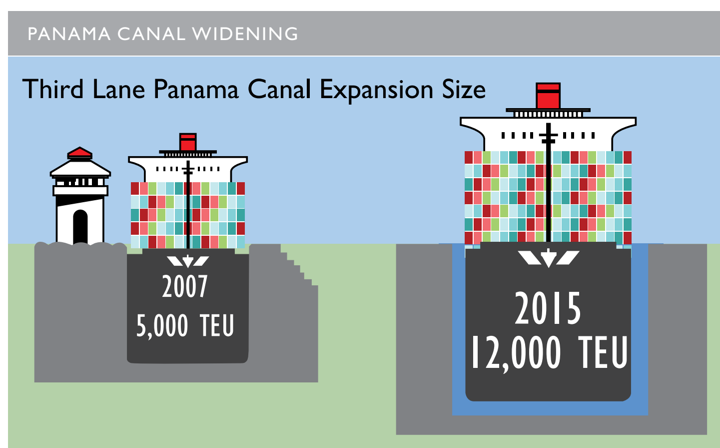
In Columbus, the Rickenbacker Intermodal Terminal is the first of three new Norfolk Southern terminals to be added as part of the Heartland Corridor Project. The $68.5 million facility in its initial phase occupies roughly 175 acres and has the potential to handle more than 250,000 trailers and containers on an annual basis, and was designed with significant capacity expansion as traffic volumes continue to grow. One of the most prominent features of the Rickenbacker Intermodal Terminal is its proximity to the Rickenbacker Global Logistics Park

(RGLP). This 1,300-acre park is the latest property to be developed at the Rickenbacker complex and at full build out will include up to 20 million square feet of warehouse and distribution space, giving NS Intermodal customers easy access to one of the most dynamic and integrated logistics parks in the US.

THE CARIBBEAN BASIN MUSCLES ITS WAY INTO TRANS-PACIFIC TRADE

The expansion of the Panama Canal and emergence of the Caribbean basin as a major transloading center will have a significant impact on how Asian goods enter the heavily populated eastern coasts of North and South America.

PANAMA CANAL WIDENING



Source: Cushman & Wakefield

The expansion of the 92-year-old canal, expected to open in 2015, will cost some $5.25 billion and almost double the tonnage passing through its network, from 279 million net tons in fiscal year 2005 to 508 million net tons by 2025. Lock dimensions that are now 110 feet wide by 1,100 feet long will expand to 189 feet wide and 1,400 feet long, allowing the transit of vessels up to 1,200 feet long, 160 feet wide by draft of 50 feet. The size of the largest feasible vessels will increase from 4,500 TEUs to 12,000 TEUs.

The canal's overhaul is funded, underway, and on-time, and will significantly boost East Coast service to ports and their inland hubs. This new dynamic has the potential to deflate growth (though we do not expect a contraction in demand) of West Coast ports as it decreases the competitiveness of moving goods over land to the more populated eastern half of the U.S. and Canada from ports like LA/LB, Seattle/Tacoma, and Vancouver.

A significant linkage between Hampton Roads (one of the best deepwater ports on the east coast) and Columbus, Ohio (one of the better positioned inland hubs in the country) is being strengthened by significant capacity improvements that will allow for the double stacking of containers through the mountains of West Virginia.

A number of U.S. ports are also dredging and building crane and infrastructure capacity for 2015. These include **Baltimore, Philadelphia, Charleston, Savannah, Jacksonville,** and **Miami,** all of which have announced infrastructure plans tied to the Panama Canal expansion.

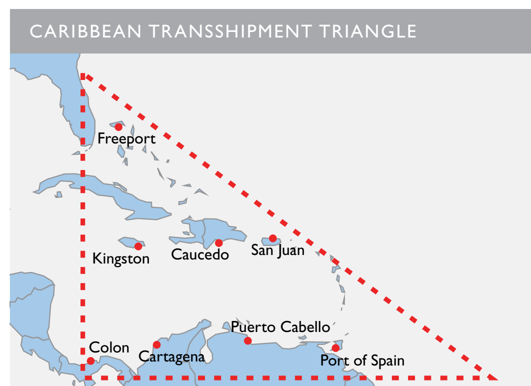
REAL ESTATE IMPACT

Panama Canal's Widespread Benefits

Immediate beneficiaries include the Ports of New York/New Jersey and Hampton Roads. Both have deep drafts, proximity to large population centers, and the infrastructure to transport product inland. Halifax, with its deep-water port, is also poised to benefit from recent investments in port facilities and rail capacity. It's more northern location, however, will hinder the port from gaining the same volume increases as better-positioned deep-water ports to the south. As well, inland hubs like Dallas and Atlanta will likely benefit from this dynamic. Both are well positioned geographically to take advantage of increased trade in the nearby ports of Houston and Savannah.

As an inland hub, **Dallas** is especially well positioned with the development of some newer high-capacity intermodal facilities. The region is already on its way to becoming an important East-West connector for freight coming through Los Angeles and Long Beach and intermodal loads travelling north from Mexico. Dallas is also poised to take advantage of short-haul shipments through the Port of Houston. This link would, however, require significant cooperation and infrastructure improvements (short rail or highway) in both Dallas and Houston.

CARIBBEAN TRANSSHIPMENT TRIANGLE



Source: Cushman & Wakefield

Major inland hubs with superior access to these East Coast ports will also make gains. Chicago, Columbus, and Atlanta will likely benefit the most from the higher volumes of cargo. With smart infrastructure improvements currently under consideration, Dallas could also benefit from more cargo delivered into the Port of Houston.

The **Caribbean**'s role as a transshipment hub will grow with the expansion of the Panama Canal, and is becoming a crossroads for trade for numerous reasons. It is ideally located at the confluence of East-West Pacific trade between Asia and the Americas and North-South Atlantic trade along the densely populated coastlines of North and South America. A proliferation of trade agreements among North and South American countries also puts the Caribbean at the center of a large and fast growing trading block.

REAL ESTATE IMPACT

Caribbean Transshipment

The largest ships are likely candidates to offload at the most active Caribbean transshipment hubs: Kingston, Caucedo, and Freeport Grand Bahamas, which will then dispatch smaller feeder ships to the Atlantic seaboard.

The primary beneficiaries in terms of real estate will be the Caribbean port countries, which will need transshipment facilities for breaking down and reconsolidating loads. Most of these facilities, however, will be developed and run by the various port authorities. The rise of the Caribbean as a transshipment center will also benefit smaller shallow-water ports that are large enough to handle the feeder ships that will serve the short-sea shipping needs along the east coasts of North, Central, and South America.

The importance of transshipment (the moving of goods from one ship or conveyance to another) to the Caribbean basin is seen in the rapid growth of port clusters in the Caribbean Sea. These ports form a triangle that is anchored by Freeport to the North, Colon to the Southeast, and Port of Spain to the Southwest. There has been a fundamental shift in transshipment patterns in the Gulf of Mexico and the Caribbean Sea from more mainland and more central (closer to large populations) ports in the west and north to these ports, whose advantage lies in their proximity to the major shipping lanes.[7]

Deep water ports are easily developed in many Caribbean locations, making them an ideal place for the large main-line container vessels that are accelerating trade between Asia and the Americas. Trans-shipment arrangements that break down and redistribute the cargo from these large container ships to smaller vessels can more efficiently serve the many and diverse (deep and shallow water) ports that are located along the coastlines of both Americas.

Even with the expansion, the Panama Canal will not be able to accommodate the biggest vessels (commonly referred to as Post Panamax) afloat today. The biggest containership currently in service, Emma Maersk, is 1,304 feet long and has a beam of 184 feet, 100 feet longer and 24 feet wider than the new locks. However, increased traffic and larger ships will result in more efficient east-west shipping and also increase the need for deepwater ports and transshipment facilities.

Investment is active throughout the Caribbean. Kingston is the largest and most established transshipment port. Freeport is also considered to be a major, fast growing hub of shipping activity. **Cuba** is experiencing increased investment despite trade restrictions by the United States. Smaller ports like **Caucedo** and **Puerto Cortes** are on the rise because of heavy investment by carriers or by governments. In the case of Puerto Cortes, the Honduran government is allowing this location to be the first port in the Caribbean to join a program that allows U.S. bound cargo to be x-rayed before being loaded onto vessels.[8]

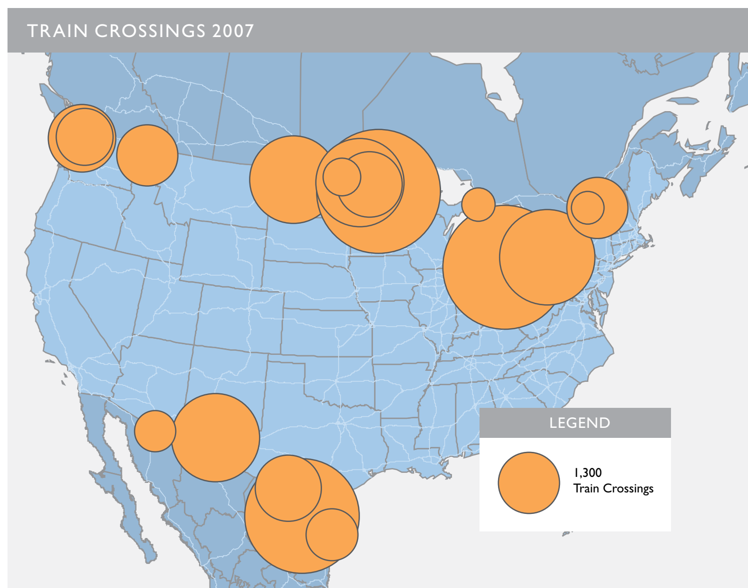
7. McCalla, Slack, Comtois, Maritime Policy & Management, July-September 2005.

8. A good summary of active Caribbean ports can be found in Gulf Shipper, CAFTA drives Caribbean Trade, Richard Knee, July 2007.

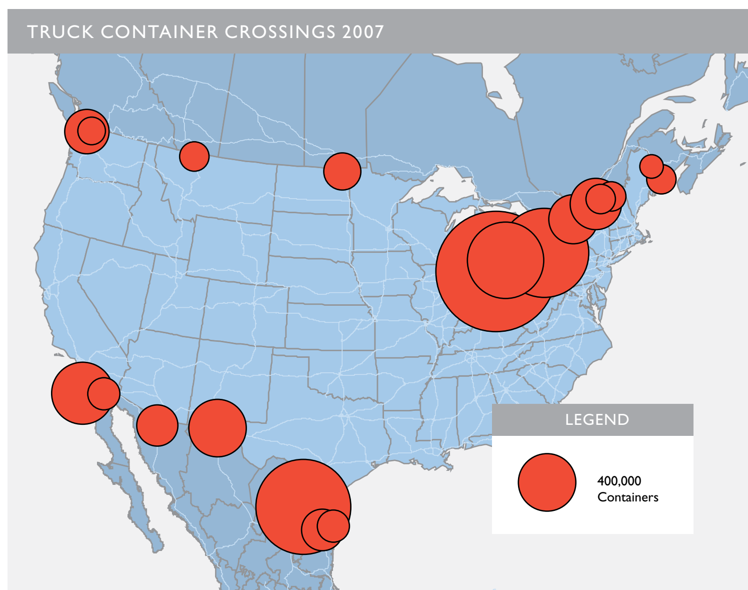
NAFTA BRINGS LOGISTICS OPPORTUNITIES TO BORDER LOCATIONS

With competition from global trading blocks, the North American Free Trade Agreement (NAFTA) has become critically important to the success of businesses within the U.S., Canada and Mexico. All countries have benefited from more integrated trade. Since NAFTA's inception in 1994, trilateral goods trade tripled, reaching $957.8 billion in 2007. Trade between the three nations is a key driver of economic growth; for every dollar worth of U.S. goods sold to China, Canada buys nearly four dollars worth, and Mexico buys more than two. This increase in trilateral trade has resulted in a logistics boom in border locations of all three countries.

TRAIN CROSSINGS 2007



TRUCK CONTAINER CROSSINGS 2007



Source: Bureau of Transportation Statistics

As a truly integrated trading block, the United States, Canada, and Mexico are not simply trading finished goods with each other, they are producing goods together. The co-production of goods is helping to boost trade numbers and productivity as companies optimize their supply chain over the entire continent. Joint production has also has been a boon to the market for related services, capital, transportation infrastructure, and raw materials, all of which are flowing freely across the borders.

NAFTA changed the trade dynamic of all three countries. Before NAFTA, complicated production regulations created the need for maquiladoras (twin plants) that resulted in co-production of goods on both sides of the Mexico-U.S. border. This need was relieved by NAFTA, but lower labor rates, increased manufacturing expertise, and the growth of Mexico as an export market for U.S. and Canadian goods continued to feed demand for manufacturing and distribution facilities along the border. Companies still, however, are avoiding risk by placing facilities on both sides of the border, which ensures a consistent flow of components to their manufacturing operations and products to consumers. Most Canadian goods bound for Mexico are warehoused in the U.S. because of the larger and steadier demand in the U.S. than the Mexican market. Interviews with Cushman &Wakefield and NAIOP professionals support this view.

REAL ESTATE IMPACT

NAFTA Opens Doors

Highly integrated trade is boosting warehousing along the borders of all three countries. In the coming years, Mexico is expected to experience the biggest gain in warehousing-related manufacturing. Direct access to the U.S. market and lower labor costs are the primary drivers.

The fluctuating U.S. dollar, labor costs, and rules and regulations for specific products have all impacted logistics planning. A downturn in the U.S. dollar in mid 2008, for example, pushed some Canadian warehousing to the United States, especially for raw or semi-processed commodities (wheat or oil), which have low labor requirements. Goods that demand more labor intensive processes usually stay in Canada because of lower benefit costs, which is mainly a result of nationalized health care in Canada.

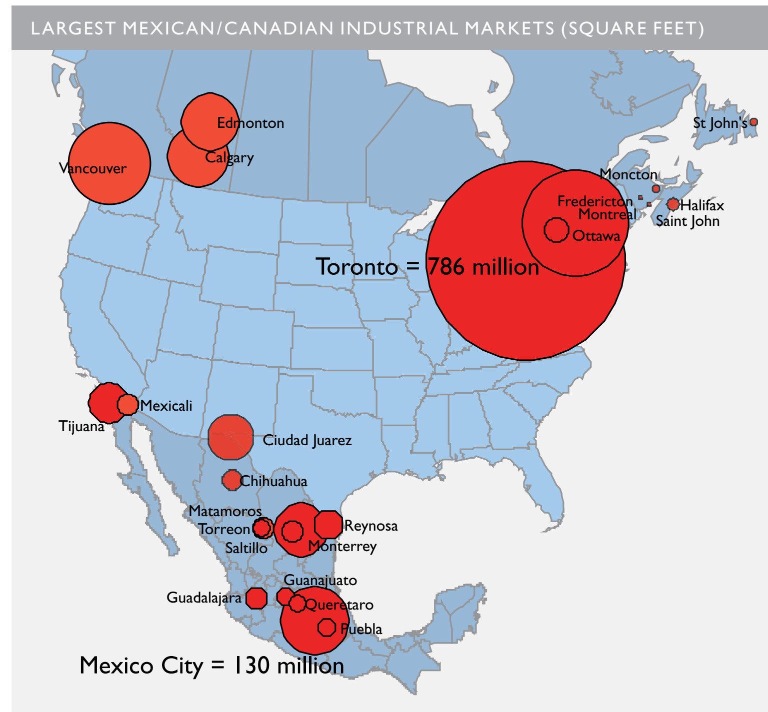
Trilateral trade has many challenges. Variances in customs and regulations have caused delays along the borders. Many logistics companies have set up shop in border locations between Mexico and the U.S. to handle the increased volumes, while near-border free trade zones (FTZs) offer on-site customs processing for goods needing inspection or approval to enter the U.S. Truck freight crossing from Mexico into the U.S. requires a handoff from a Mexican to an American driver, although a pilot program being administered by the U.S. Department of Transportation is working to address this issue. Easing of restrictions could open up cross-border distribution plays that are more frequently seen along the Canadian-U.S. border, where large distribution centers serve the needs of consumers and businesses on both sides.

REAL ESTATE IMPACT

Free Trade Growth

In Mexico, border cities such as Tijuana, Juarez, and Reynosa are reporting increased logistics action, as are some inland locations such as Monterrey, Mexico City and Guadalajara. On the U.S. side, border towns in California, Texas, Arizona and New Mexico are experiencing increased logistics and manufacturing demand, particularly in cities such as El Paso and Tucson, which boast Free Trade Zones.

LARGEST MEXICAN/CANADIAN INDUSTRIAL MARKETS (SQUARE FEET)



Source: Cushman & Wakefield, Mexico Now

Cross border trade between the U.S. and Canada has remained strong. However, an increased focus on immigration and security regulations has led to border delays, which factors into site-selection decisions. Governments in both countries have worked to develop mutually compatible security programs to expedite clearances and enhance trade flows.

The biggest winner in terms of increased U.S.-Canada trade and demand for distribution space is the **Greater Toronto Area** (GTA), the third largest industrial market in North America. Its large population base and location along a corridor that straddles Detroit, Michigan and Northern New York allows it to serve industries and populations in Southeastern Canada, the Midwest, and New England. Mississauga, the GTA's most dynamic submarket, provides a cost-competitive base with a solid infrastructure of air, road, and rail networks. The integration with Detroit and the industrial belt extending from Chicago to New York position the region as an important player in business-to-business supply chain needs.

Vancouver has seen growth as a port of entry for goods from Asia, especially in light of congestion issues at other U.S. West Coast ports. Port traffic in Vancouver has been strong and growing, increasing the demand for warehousing and especially for large, flexible cross-docked facilities that are ideal for handling high volumes of freight. Significant short-sea investments in Vancouver that move cargo from the ports to warehouses and staging areas are expected to increase efficiency in the coming years.

Smaller regions located along the Trans-Canada Highway have also experienced an increase in activity as a result of lower land costs and rent. The Sumas, Washington-Abbotsford, British Columbia crossing and the Champlain, New York-Lacolle, Quebec crossing have all recorded increased activity in their warehousing sectors.

Trilateral trade and integration resulted in a greater convergence of industrial park design in the three countries. Mirroring the trend in the U.S., Canada is reporting a growing need for very large distribution centers (500,000 square feet and larger). Interviews with Cushman & Wakefield and NAIOP professionals in Canada indicated that there has been an increase in developments with more dock doors and cross-dock facilities and increased truck staging. While Toronto has the greatest number of these large facilities, Calgary, and Quebec all reported a sizing-up and modernization of centers in the past five years.

Mexican development and leasing professionals are seeing the same trend, although on a smaller scale, with very little speculative development and build-to-suit investments being the norm. American and other foreign-based retailers such as Wal-Mart are entering and expanding in the Mexican market, looking for consistency in their facilities. As well, the rapid modernization of domestic Mexican retailing is transforming markets from coast to coast. This trend is coupled with an influx of institutional investors, who are credited with bringing international best-practices to industrial park design and operations.

"The work of the Foundation is absolutely essential to anyone involved in industrial, office and mixed-use development. The Foundation's projects are a blueprint for shaping the future and a road map that helps to ensure the success of the developments where we live, work and play."

Ronald L. Rayevich, Founding Chairman, NAIOP Research Foundation

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NAIOP, the Commercial Real Estate Development Association, is the leading organization for developers, owners and related professionals in office, industrial and mixed-use real estate. NAIOP comprises 17,500 members in North America. NAIOP advances responsible commercial real estate development and advocates for effective public policy. For more information, visit www.naiop.org.

The NAIOP Research Foundation was established in 2000 as a 501(c)(3) organization to support the work of individuals and organizations engaged in real estate development, investment and operations. The Foundation's core purpose is to provide these individuals and organizations with the highest level of research information on how real properties, especially office, industrial and mixed-use properties, impact and benefit communities throughout North America. The initial funding for the Research Foundation was underwritten by NAIOP and its Founding Governors with an endowment fund established to fund future research. For more information, visit www.naioprf.org.

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Requests for funding should be submitted to research@naiop.org. For additional information, please contact Sheila Vertino, NAIOP Research Foundation, 2201 Cooperative Way, Herndon, VA, 20171, at (703) 904-7100, ext. 121, or vertino@naiop.org.

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Front cover collage: Lower right photo of Lazaro Cardenas, Mexico by Salvador Solorzano

APPENDIX: NAIOP FUNDED RESEARCH

The following are highlights of completed research projects funded by the NAIOP Research Foundation. For a complete listing and free download of research reports, please visit the Foundation's Website at www.naioprf.org.

SELECT NAIOP RESEARCH FOUNDATION FUNDED RESEARCH

National and Metro Predictors of Commercial Real Estate Development (2008)

The Contribution of Office, Industrial and Retail Development and Construction to the U.S. Economy (2008)

Measuring the Impact of Hispanic Population Growth on the Location of and Demand for Commercial Real Estate in the United States (2008)

Green Building Incentives That Work: A Look at How Local Governments Are Incentivizing Green Development (2007)

Commercial Real Estate in a Flat World, The Implications of Corporate Restructuring and Economic Globalization for Industrial, Office and Mixed-Use Property in America (2007)

Exploration of LEED Design Approaches for Warehouse and Distribution Centers (2007)

NAIOP Terms and Definitions: U.S. Office and Industrial Market (2005)

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For more information about C&W Research, contact:

Maria T. Sicola
Executive Managing Director,
Research Services
(212) 841-7781
Maria.Sicola@cushwake.com

Michael J. Williams
Assistant Director,
Research Services
(503) 279-1794
Mike.Williams@cushwake.com

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