Final

IIPOD Competitive Assessment and Opportunities Study

Task 2: Global, National & Regional Freight Transportation Influences

Submitted to:
Office of Economic Development
City of Dallas

March, 2009

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1. Executive Summary

1.1 IIPOD Profile
The International Inland Port of Dallas (IIPOD) is a public-private partnership designed to further develop Dallas as a premier logistics and distribution center, and regional freight transportation hub. IIPOD is a catalyst for economic development supporting investment, job growth and the local tax base. The project is located in Southern Dallas County, covering an impact area of 234,000 acres across 12 municipalities. IIPOD is built on the regions excellent transportation infrastructure, which includes five interstate highways and two Class I railroads – UP and BNSF– and is focused on the I-35, I-45, I-20 and the future Loop 9. IIPOD is the location of UP's recently completed Dallas Intermodal Terminal and a potential BNSF intermodal terminal. The area also includes the Lancaster Airport. The location of the IIPOD is shown in Figure 1-1. Long term objectives include the future incorporation of new transport concepts and technologies, such as agile terminals and enhanced security and logistics services to facilitate faster movement and processing of international cargo.

![Figure 1-1: Location Map of IIPOD](image)

Source: City of Dallas

The IIPOD incorporates a variety of land uses and facilities, which will be built out over the next 30 years, driven by market needs. As shown in Figure 1-2, two important elements are the intermodal rail yards developed by UP and BNSF, and logistics parks surrounding these facilities, which will support movements of cargo by rail. Another important element is the location in proximity to the future Loop 9, a highway project designed to provide improved access for Southern Dallas County.
1.2 Study Objective
The purpose of the study is to evaluate the competitive position and opportunities for directly or indirectly advancing freight movement into, out of and through the Dallas area. This assessment will analyze, evaluate and identify the highest opportunities and roles for the City to participate in the improvement of freight movement, which will benefit the International Inland Port of Dallas (IIPOD). The study comprises four tasks: (1) Existing & Projected Cargo Volumes, (2) Global, National, and Regional Freight Transportation Influences, (3) Competitive Assessment, and (4) Recommendations.

1.3 Purpose of Task 2: Global, National & Regional Freight Transportation Influences
The objectives of Task 2 are to identify key influences that may impact future freight flows through the Dallas region and how they impact the baseline freight flows presented in the Task 1 report. The identification of major trends is derived from confidential discussions with industry participants (shippers, etc.), a review of industry literature and the project team’s experience of the transportation industry. Major topics covered in this task are outlined below:

- Economic and Population Trends
- Shipper and Transportation Industry Trends
- Port Industry
- Transportation Infrastructure

Figure 1-2: Layout Map of IIPOD
Source: City of Dallas
1.4 Findings and Conclusions

1.4.1 Economic and Population Trends
The U.S. economy is projected to be weak for the next one to two years and then return to a more stable growth path in 2011 and beyond. The Dallas and surrounding metro areas are projected to see a doubling of regional economic activity (measured by gross metro product) over the next 30 years driven by growth of population, employment, consumption, industry and investment. Texas is projected to have one of the fastest growing populations over the next two to three decades; only Arizona, Nevada and Florida are projected to grow at a faster rate. The total population of Texas is projected to reach 25 million in 2010 and 33 million in 2030. The Dallas and surrounding metro areas are projected to experience similar trends in population growth. In addition, bordering states and Northeast Mexico will also experience population growth.

Free trade agreements (FTA) have been an important element in the growth of U.S. trade over the past decade. NAFTA has generated substantial growth of imports and exports with Mexico and Canada since 1994. In recent years, FTAs with countries in the Caribbean, Central and South America have provided additional opportunities for U.S. exports and boosted imports from these regions. By virtue of its large economy, location and transportation infrastructure (ports, railroads, highways, etc.), Texas has been a beneficiary of these free trade agreements and it is expected that these agreements will continue to support growth of freight movements to, from and through Texas.

The long term economic and population trends are expected to generate increased freight flows for the Dallas region, and drive investment in transportation and logistics infrastructure. Further expansion of international trading opportunities will also provide a boost to cargo flows in the region.

1.4.2 Shipper Distribution Networks
Dallas is well positioned to take advantage of developing trends in shipper supply chains. Rising transportation and other costs place increased emphasis on DC proximity to consumption markets. As a major population center with good transport connections to other areas of Texas and neighboring states, a Dallas DC fits this network strategy. In particular, the combination of intermodal rail and logistics infrastructure at IIPOD is conducive to lowering trucking “last mile” costs for shippers managing inbound rail moves. Use of all-water services and sourcing from Latin America are also expected to support cargo flows through Gulf ports into the Dallas region.

Shipper comments suggest that the following actions could enhance Dallas as a center for cargo distribution:

- Establish intermodal rail connection with Houston – partner with UP or BNSF, or a shortline rail operator. Intermodal rail service from Houston would lower transportation costs in and out of Dallas based DC’s, thereby increasing the viability of a regional DC in Dallas. Reduced truck congestion, lower highway maintenance and reduced air pollution are additional benefits of this suggestion.
- Identify companies that ship cargo into Dallas from the West Coast, Houston, and other centers. There may be opportunities to consolidate cargo from different origins and cross-dock, or distribute regionally or nationally.
- Integrate “green technologies” into the development process. Environmental or “green” requirements are increasingly being required by warehouse and DC tenants.
- Applying an environmentally friendly development strategy and state of the art technology may provide market differentiation.
1.4.3 Port Industry
Trends in the container shipping industry – port diversification, Panama Canal expansion, etc. – are expected to support long term growth of container throughput at ports in Texas. The economic, population, and trade trends discussed earlier are also anticipated to drive increased activity at the ports. Houston is expected to remain the dominant container port and it is planning long term investments in terminal capacity to match trade growth. Freeport and Corpus Christi want to expand or develop new container business, and they are seeking private sector terminal operators to participate in new terminal projects.

The projected long term growth of Texas container ports will drive requirements for logistics infrastructure and services to support the increased trade flows, both surrounding the ports and at inland locations such as Dallas. In addition, the increased cargo flows will place greater pressure on port infrastructure and environments, and encourage the development of means to expedite the flow of cargo to inland locations for processing and/or onward distribution. As a major transportation hub, the City of Dallas should monitor these port expansions and coordinate with the ports on common areas of interest – short-haul rail services, environmental impacts, and planning of transportation infrastructure.

1.4.4 Transportation Infrastructure
Dallas is situated on existing major rail and highway corridors for local, regional and NAFTA trade. In addition, proposed new projects such as Loop 9 and the Trans-Texas Corridors will provide additional rail and highway infrastructure for freight movements in, out and through Dallas. IIPOD is well positioned to benefit from the existing transportation infrastructure and proposed improvements to infrastructure.
2. Economic and Population Trends

2.1 Economic Trends
The outlook for the U.S. economy is poor for the next 2-3 years due to fall out from the financial crisis, housing market decline, weaker consumer spending and industrial activity, and poor global economic growth. The forecast of annual growth of U.S. gross domestic product (GDP) is shown in Figure 2-1. Annual growth is projected to be negative in 2009 with positive growth projected to return in early 2010. There are downside risks to this outlook: financial markets fail to stabilize, growth of consumer spending remains weak, domestic industry continues to restructure, and U.S. exports are dampened by a weaker global economy. Beyond 2010, the U.S. economy is projected to return to a more stable growth path. The U.S. dollar is projected to weaken over the next one to two years (Figure 2-2) as the ongoing economic weakness impacts the exchange value of the U.S. dollar.

Figure 2-1: Forecast of U.S. Gross Domestic Product, Annual Growth Rate

[Graph showing forecast of U.S. GDP annual growth rate from 2007 to 2017 with projection to return to positive growth by 2010]

Source: Moody's Economy.com

Figure 2-2: Forecast of U.S. Dollar Exchange Rate, Broad Index

[Graph showing forecast of U.S. dollar exchange rate index from 2007 to 2017 with projection of weakening dollar]

Source: Moody's Economy.com
Indicators of long term regional economic development are provided by the 30-year forecasts for gross metro product\(^1\) (Figure 2-3) and non-agricultural employment (Figure 2-4). The forecast data are for the metro divisions covering Dallas and surrounding areas. Gross metro product is projected to more than double over the 30-year forecast horizon driven by growth in population, employment, consumption, industry and investment. This long term growth will drive a need for additional transportation infrastructure to accommodate the movement of goods in, out and within the Dallas region.

\(^1\) An equivalent measure to gross domestic product (GDP) used to measure the U.S. economy.
2.2 Population Trends
Population growth is expected to support expansion of freight flows in, out and through Texas, in both domestic and international trade lanes. The population projections for Texas and states bordering Texas (New Mexico, Oklahoma, Louisiana, and Mississippi) are presented in Figure 2-5. Texas is projected to have a population of 25 million in 2010 and 33 million in 2030. The population of states bordering Texas is projected to be 13 million in 2010 and 14 million in 2030.

![Figure 2-5: Population Projections for Texas and Bordering States](image.png)

Source: State Interim Population Projections, U.S. Census Bureau

The overall trend in projected population growth for Texas is reflected in the long term forecasts for the Dallas region (Figure 2-6). The combined population of the three main metro areas is projected to increase from 6 million in 2005 to 6.7 million in 2010 and 9.7 million in 2030.

![Figure 2-6: Population Projections for Dallas and Nearby Metro Divisions](image.png)

Source: Moody's Economy.com
The population of Mexico is projected to increase to 110 million in 2010 and 128 million in 2030 (Figure 2-7). The Mexican states bordering Texas (Tamaulipas, Nuevo Leon, Coahuila and Chihuahua) are anticipated to experience a similar rate of population growth rate. Currently, the four states have a population of 12 million. Strong population growth is projected for countries in Central America, the region’s population projected to reach 59 million in 2030. Growth in the Caribbean will be centered on the larger islands of Cuba, Dominican Republic and Haiti, and Puerto Rico.

![Figure 2-7: Population Projections for Mexico, Central America and Caribbean](image)

Source: Medium Variant Projection, United Nations Population Division

### 2.3 Free Trade Agreements

Free trade agreements (FTA) have been an important driver of U.S. international trade growth over the past decade, providing improved foreign market access for U.S. exports and opening U.S. markets to imports, including those from many developing economies. The following discussion provides brief profiles of active and proposed FTAs.

#### 2.3.1 NAFTA

The North American Free Trade Agreement (NAFTA) is a trade agreement between the United States, Canada, and Mexico that liberalizes restrictions on trade amongst the three countries. Since implementation January 1, 1994, the value of U.S. trade with Canada has increased by 146 percent and the value of U.S. trade with Mexico has increased by 266 percent (Figure 2-8). Some of the agreement’s objectives include:

- The elimination of tariff or duty rates (all qualifying products to Canada are now duty free, and nearly all qualifying products to Mexico are now duty free).

- Promoting conditions of free competition, and increasing market access and investment opportunities within the free trade area.

In order for a product to be eligible for lower tariff rates when entering Mexico or Canada, the product must be produced in the United States, entirely of NAFTA component parts, or if foreign components are used, the foreign component must undergo sufficient processing in the United States to meet NAFTA requirements.
2.3.2 CAFTA-DR

The Central America-Dominican Republic-United States Free Trade Agreement (CAFTA-DR) includes seven signatories: the United States, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua. The U.S. Congress approved the CAFTA-DR in July 2005 and the President signed the implementation legislation on August 2, 2005.

The U.S. has implemented the CAFTA-DR on a rolling basis as countries make sufficient progress to complete their commitments under the FTA. The Agreement first entered into force between the United States and El Salvador on March 1, 2006, followed by Honduras and Nicaragua on April 1, 2006, Guatemala on July 1, 2006, the Dominican Republic on March 1, 2007, and Costa Rica on January 1, 2009.

In addition to tariff reduction, CAFTA-DR provides new market access for U.S. consumer and industrial products and agricultural products. It also provides access to government procurement in the partner countries, liberalizes the services sectors, protects U.S. investments in the region, and strengthens protections for U.S. patents, trademarks, and trade secrets. The Agreement covers customs facilitation and provides benefits to small and medium-sized exporters. Provisions are also included that address government transparency and corruption, worker rights, protection of the environment, trade capacity building, and dispute settlement.

CAFTA-DR creates the third-largest U.S. export market in Latin America, behind only Mexico and Brazil, and the 10th largest U.S. export market in the world. The value of U.S. trade with the CAFTA-DR region was $45 billion in 2008, a nine percent increase from 2006. The agreement has been a boost to U.S. exports, which reached $25 billion in 2008 (Figure 2-9), a 13 percent increase on 2008.

Most Dominican Republic and Central American exports into the U.S. were already benefiting from the Caribbean Basin Initiative (CBI), a trade preference program that provided duty-free treatment for exports to the U.S. CAFTA-DR reciprocally reduces tariff and non-tariff barriers for U.S. exports into the region. CAFTA-DR also ensures that U.S. companies are not disadvantaged by the trade agreements that Central America has already negotiated with other countries.
2.3.3 Chile Free Trade Agreement

The United States-Chile Free Trade Agreement entered into force on January 1, 2004, and more than 85 percent of bilateral trade in consumer and industrial goods became duty free. Duties on other products are gradually been phased out over a 12-year period. The agreement also contains commitments by both countries on many non-tariff issues including; intellectual property rights, services, investment, temporary entry of business/technical persons, and telecommunications. As shown in Figure 2-10, U.S. trade with Chile has experienced substantial growth over the past three years. The value of total trade increased from $6.4 billion in 2003 (before the FTA was implemented) to $20 billion in 2008, U.S. exports to Chile growing by 345 percent and U.S. imports from Chile expanding by 121 percent.

Source: Foreign Trade Statistics, U.S. Census Bureau
2.3.4 Colombia Trade Promotion Agreement
The Colombia Trade Promotion Agreement (TPA) was signed by the U.S. and Colombia in November 2006 and is awaiting congressional approval before coming into force. The agreement will give U.S. companies improved access to the Colombia market, requires Colombia to implement legal and business reforms to implement the agreement, and provides greater U.S. market access for Colombian exports. Assuming the agreement is implemented, U.S. trade with Colombia is projected to grow at a faster rate than in the past. The value of total U.S. trade with Colombia was $24 billion in 2008 (Figure 2-11).

![Figure 2-11: Value of U.S. Trade with Colombia](image)

Source: Foreign Trade Statistics, U.S. Census Bureau

2.3.5 Panama Trade Promotion Agreement
The United States and Panama concluded free trade negotiations of the U.S.-Panama Trade Promotion Agreement (U.S.-Panama TPA) in December 2006 and signed the FTA in June 2007. As well as covering market access, notably for U.S. exports of agricultural products, the agreement covers issues related to labor, the environment, intellectual property and other areas. The agreement is awaiting approval and implementation by both governments. The agreement is anticipated to boost trade with Panama, which reached a record $5 billion in 2008 (Figure 2-12).

![Figure 2-12: Value of U.S. Trade with Panama](image)

Source: Foreign Trade Statistics, U.S. Census Bureau
2.3.6 Peru Trade Promotion Agreement
The United States and Peru signed the United States-Peru Trade Promotion Agreement in April 2006. The agreement was approved by the respective governments in 2007 and it will enter force once Peru has taken the necessary steps to ensure implementation of its obligations. Similar to other agreements, this FTA provides greater market access between the two countries. U.S. trade with Peru reached a record $12 billion in 2008, with significant growth of U.S. exports (Figure 2-13).

Figure 2-13: Value of U.S. Trade with Peru

![Graph showing the value of U.S. trade with Peru from 1998 to 2008.]

Source: Foreign Trade Statistics, U.S. Census Bureau

2.3.7 Other Agreements
The U.S. has implemented or is negotiating free trade agreements with other countries in Latin America and globally. Recent or pending agreements include:

- Australia
- Bahrain
- Israel
- Jordan
- Morocco
- Singapore
- Korea - Pending
- Oman - Pending

2.4 Conclusions
The U.S. economy is projected to be weak for the next one to two years and then return to a more stable growth path in 2011 and beyond. The Dallas and surrounding metro areas are projected to see a doubling of regional economic activity (measured by gross metro product) over the next 30 years driven by growth of population, employment, consumption, industry and investment. Texas is projected to have one of the fastest growing populations over the next two to three decades; only Arizona, Nevada and Florida are projected to grow at a faster rate. The total population of Texas is projected to reach 25 million in 2010 and 33 million in 2030. The Dallas and surrounding metro areas are projected to experience similar trends in population growth. In addition, bordering states and Northeast Mexico will also experience population growth.

Free trade agreements (FTA) have been an important element in the growth of U.S. trade over the past decade. NAFTA has generated substantial growth of imports and exports with Mexico and Canada since 1994. In recent
years, FTAs with countries in the Caribbean, Central and South America have provided additional opportunities for U.S. exports and boosted imports from these regions. By virtue of its large economy, location and transportation infrastructure (ports, railroads, highways, etc.), Texas has been a beneficiary of these free trade agreements and it is expected that these agreements will continue to support growth of freight movements to, from and through Texas.

The long term economic and population trends are expected to generate increased freight flows for the Dallas region, and drive investment in transportation and logistics infrastructure. Further expansion of international trading opportunities will also provide a boost to cargo flows in the region.
3. Shipper Distribution Networks
The project team conducted interviews with shippers and service providers to identify major trends that are expected to impact the structure of supply chains, the location and function of distribution centers, and the activities undertaken at distribution centers. In addition, companies were asked about the impact of these trends on Dallas as a regional distribution hub. The interviews were supplemented by a review of industry literature and the project team’s experience from other projects in different sectors of the logistics and transportation industry.

3.1 Network Costs
Rising fuel costs are having an effect on how supply chains are being evaluated, with an emphasis on how distribution center (DC) locations can lower overall transportation costs. The strategies that many supply chain professionals are adopting focus on:

- Positioning DCs closer to customers, rail hubs or ports to shorten the trucking segment.
- Consideration of less expensive transportation modes and the optimization of cargo to the most economical mode of transportation.
- Greater use of intermodal and even box car rail service at the expense of inventory carrying cost increases.
- Evaluation of alternative U.S. port gateways.

At the heart of cost reduction strategies is plans to reduce transportation costs by selecting DCs that are near to customers, ports and railheads. Close proximity to customers also increases the likelihood of meeting on-time performance standards, and “rush” orders are easier and less expensive to accommodate. Operations within the walls of a DC are also being adjusted to take costs out of the supply chain whenever possible.

3.1.1 Use of Trucking
Supply chain professionals are focused on controlling their over-the-road trucking costs in response to the higher fuel prices of the past three to four years. As shown in Figure 3-1, fuel prices started to increase in early 2004 and the rate of increase accelerated in the past year. In the first seven months of 2008, diesel fuel prices increased 42 percent from $3.31 per gallon to $4.70 per gallon. Prices have fallen sharply since mid-2008 and were $2.20 per gallon in February 2009. However, recent prices are still above pre-2005 levels and shippers remain concerned about longer term price increases that may occur in response to projected national and global economic growth post-2009.

*Figure 3-1: U.S. Diesel (On-Highway) Prices*

Source: U.S. Gasoline and Diesel Retail Prices, August 2008, Energy Information Agency
Shippers are exposed to higher fuel costs by the fuel surcharge programs applied by trucking companies, which are designed to recover the higher fuel prices paid by truckers. The fuel surcharge is a percent of the base rate and changes in response to the level of diesel fuel prices. An example of a fuel surcharge program is shown in Figure 3-2. The surcharge increases in line with fuel prices. For example, at an average price per gallon of $4.30 per gallon in August 2008, the fuel surcharge would be 33.9 percent for LTL shipments and 50.9 percent for truckload shipments. If a shipper was paying a base truckload rate of $1,000, then it would pay an additional $509 as a fuel surcharge.

Figure 3-2: Example of Fuel Surcharge Program

![Figure 3-2: Example of Fuel Surcharge Program](source: myyellow.com)

The Energy Information Agency provides long term forecast of energy prices, including diesel prices. As shown in Figure 3-3, diesel prices are projected to remain above pre-2005 levels (which were under $2 per gallon) under the EIA’s reference case. This indicates that shippers must accommodate high fuel prices into their long term planning of supply chains and DC locations.

Figure 3-3: Long Term Forecast of U.S. Diesel (On-Highway) Prices

![Figure 3-3: Long Term Forecast of U.S. Diesel (On-Highway) Prices](source: Annual Energy Outlook 2008, Energy Information Agency)
To combat the rise in fuel prices, some supply chain managers are adjusting supply chains to shorten trucking distances\(^2\). When possible, shipments with trucking distances of over 700 miles are being converted to intermodal rail. Proximity to an intermodal rail hub is of critical importance in order to mitigate trucking expenses between the rail facility and the distribution center. "Final mile" trucking, which is the delivery from the DC to the customer, is considered to be the most expensive portion of total transportation costs. Reducing final mile delivery expenses therefore provides one of the greatest opportunities to reduce overall transportation costs. Shippers are also consolidating higher cost less-than-container load (LCL) shipments into full trailer loads.

Shippers who transport high-value goods, or products that are time sensitive, remain likely to use trucking services, even considering higher fuel prices. The high cost of carrying inventory, or short transit-time requirements outweigh transportation savings that intermodal rail might provide.

On a related subject, interviews suggest that the current sluggish economy, compounded by high fuel prices is affecting trucking availability. Small truckers, which typically service the less-than 300-mile market are the first to go out of business, thus creating shortages in delivery areas within 300 or so miles of a DC or rail hub. Respondents noted that an advantage of large economic and population centers such as Dallas is that trucker shortages are likely to be less severe due to the greater concentration of trucking capacity and volume of business.

\subsection*{3.1.2 Use of Rail}

Shippers are opting to use lower cost intermodal rail over truck when possible in order to avoid escalating trucking expenses. Inventory carrying cost savings made possible by fast trucking transit times have, in many cases, been erased by the higher trucking fuel surcharges. This trend increases the importance of proximity to intermodal rail hubs and increases the competitiveness of locations with a strong intermodal rail infrastructure. Shippers stated that this trend is positive for the Dallas area, which has intermodal service offered by BNSF, KCS and UP. Shippers also stated that the Houston-Dallas corridor may be suitable for short-haul intermodal rail service, particularly with the projected long-term growth of containerized cargo through the Port of Houston. Currently, cargo transiting the Port of Houston or other Texas ports to the Dallas area is transported by truck. Case studies of short-haul rail services are explored in Task 3 of this study.

\subsection*{3.1.3 Distribution Center Strategies}

Shippers stated that two broad DC strategies are available to reduce overall network costs. The chosen strategy is based on network analysis, cost reductions, and individual company needs. They are:

- DCs are being consolidated to make inventory management and transportation more efficient. As a result, warehouse size requirements or the warehouse “footprint” is expanding. One respondent would not consider warehouses under 750,000 square feet in size.
- A contrasting strategy is to increase the number of DCs to coincide with the number of customer populations centers.

\subsection*{3.1.4 Transloading of International Cargo}

Importers are increasing their use of transloading of cargo from 40-foot marine containers into 53-foot domestic equipment in order to lower inland transportation costs. Depending on the type of cargo, up to five 40-foot containers can be condensed into three 53-foot containers, thus reducing the total number and cost of containers moved. This is increasing the demand for cross-dock type facilities near ports, access to intermodal rail service and access to pools of empty domestic equipment. Benefits to shippers include:

- Lower inland transportation costs due to fewer boxes moving by intermodal rail or from use of 53-foot domestic trailers. Transloading has become of more interest to shippers due to the rise of fuel costs.

\(^2\) Finding based on interviews with shippers.
• Lower pricing with ocean carriers because the shipper is returning the marine container at or near the discharge port, which allows the ocean carrier to expedite the return of the container to Asia for another inbound revenue load.
• Postponement of merchandise allocation by final destination, creating a supply chain more responsive to specific regional demand.
• Creation of mixed container loads for individual distribution centers or retail stores.

3.2 Environment
Shippers and service providers are starting to incorporate environmental impacts into supply chain design and operation, in response to more stringent environmental regulations and higher energy costs. Environmental impacts are being addressed in a variety of ways from building design, equipment efficiency, vehicle route management, and staff training. Tenant requirements for “Green” warehouse capabilities, such as alternative energy usage, or warehouses with reduced environmental impacts, will be more common. The following are some of the current or planned green transportation and logistics initiatives being undertaken by shippers and service providers are shown in Table 3-1.

| General |
| DC and Warehouse |
| Transport |
| Product and Packaging |
| --- | --- | --- | --- |
| • Emissions measuring and/or reduction |
| • Improving energy efficiency |
| • Using more environmentally friendly logistics providers |
| • Requesting emissions data from suppliers |
| • Responding to customer requirements |
| • Reductions in toxins and hazardous chemicals |
| • Staff training |
| • Strategic warehouse & distribution center placement |
| • Sustainable and LEED certified buildings |
| • Solar power |
| • Vehicle re-routing to reduce miles |
| • Maximizing load and monitoring fuel usage |
| • Alternative fuels |
| • Switching to more fuel-efficient road vehicles |
| • Switching to more fuel-efficient modes of transport |
| • Improved product design and packaging |
| • Recycling |
| • Green material usage |

Source: TranSystems

One area of increased focus is the improved design of DCs and warehouses to incorporate greater energy efficiency. Leadership in Energy and Environmental Design (LEED) was developed by the United States Green Building Council (USGBC) to transform the built environment to sustainability by providing the building industry with consistent, credible standards for what constitutes a green building. Design aspects include upgraded insulation, water runoff controls, lighting control systems, skylights and windows to supplement “wired” lighting (Figure 3-4), and painting walls, ceilings and columns white to help improve lighting efficiency, and improved building ventilation.

More aggressive programs include the installation of solar panels on roofs to provide off-grid power (Figure 3-5). Retailers and shippers, such as COSTCO, and industrial property developers have started to install solar panels on some of their warehouse properties. Some states, including California, New York, and New Jersey) provides incentives and other states are anticipated to follow in 2009.
Service providers, including railroads, are also addressing environmental impacts during design of facilities. In response to stricter environmental standards surrounding operations at the ports of Los Angeles and Long Beach, BNSF and UP railroads are planning new intermodal rail yard capacity that incorporates operations with a reduced environmental footprint. The proposed expansion of UP's Intermodal Container Transfer Facility, located 5 miles from the two ports will include the purchase of rail-mounted, electric gantry cranes, the elimination of the current diesel powered gantry cranes and yard tractors, and use of low-emission diesel locomotives. Similarly, BNSF plans for a new near-dock intermodal yard incorporates similar equipment standards.
3.3 Port Gateway Diversification

A trend toward diversifying U.S. gateways by increased usage of East and Gulf Coast ports has been ongoing. The strategy was developed in response to U.S. West Coast port congestion, intermodal rail reliability issues, intermodal rail costs, and the need to service growing consumption markets in the Southeast and Gulf regions. Shippers who previously shipped Asia origin cargo over U.S. West Coast ports began to shift a portion of their cargo to “all-water” services that accessed East and Gulf coasts via the Panama Canal. All-water services have slower transit times, but are normally more reliable when congestion conditions exist. Figure 3-6 overlays the all-water share of the transpacific container import trade with events that affected timely cargo delivery:

![Graph showing all-water transpacific share with one-time events](image)

Source: TranSystems, derived from JOC PIERS data

Service slow-downs due to port congestion, or intermodal rail capacity issues were noted by shippers beginning in 1998, and continued into 2004. As a result, the all-water share of transpacific cargo begins to increase in 2002. Low value or non-time sensitive cargoes began to be diverted to these all-water services, and shippers are increasingly lengthening the delivery lead time for many items in order to increase the amount of cargo that is eligible for the all-water alternative. Shippers indicate that future Panama Canal expansion plans will re-enforce this all-water trend.

Another factor that is contributing to increased use of East and Gulf ports is a trend towards shifting cargo sourcing to Central and South America. Rising costs or reliability concerns from three key countries are influencing this change:

- High ocean freight rates and manufacturing costs in China are making this country relatively less competitive as a source.
- Vietnamese production quality is perceived to be unreliable, causing manufacturers to search for alternative sourcing countries.
- India has not developed as expected to compete with China as a major exports.

The combination of the above factors favors “near sourcing” in Mexico, and other Central and South American countries, resulting in increased cargo transiting US Gulf and East Coast ports, and border crossings. Reduced reliance on West Coast ports, reduced transit-time and ocean freight cost savings over Asia sourced cargo are shipper stated benefits of near-sourcing.
3.4 Other Trends
Interview respondents stated that several other trends are expected to impact DC operations within the next five to ten years.

- Information technology will advance to allow for quicker reaction to changing market needs. Importers, shippers, manufacturers and retailers will be capable of managing inventory levels on a nationwide basis. For example, they can quickly replenish "out-of-stock" inventories with product from "over-stock" areas. This will involve upgrading and/or replacing existing warehouse management systems (WMS) and incorporating voice, RFID and other hardware to improve real-time data collection.

- Security compliance will continue to be an important element of the international supply chain, both for imports and exports via ports and via overland routes with Mexico.

- Value-added warehouse services, such as product price tagging and light assembly, are increasingly being performed in Asia, but these services may also experience increased demand in the U.S. if the trend towards U.S. based cargo consolidation continues to rise.

3.5 Dallas DC Use and Opportunities
Shippers suggested several roles and opportunities for a distribution center situated in the Dallas area based on either their existing DC networks or the potential impacts of industry trends. The uses were:

- Regional DC or cross-dock
  - Consolidate and distribute cargo arriving by rail from the US West Coast and by truck from Texas ports.
  - Serve as a Central and South American regional gateway

- Although it would be possible to use a Dallas based DC as a national cross-docking or distribution facility, shippers advise that a more likely distribution area is up to 1,000 miles of Dallas via truck, with more emphasis on the up to 500-mile hinterland.

- Local DC

A DC located in Dallas would be well positioned truck shipments to all points in Texas, as well as less populated states to the north and west, such as in New Mexico, Oklahoma, Arkansas and Louisiana. High population centers, such as Tulsa, OK, Phoenix, AZ, Memphis TN or New Orleans, LA that are also likely DC locations, would compete for service areas that are closer to those locations. Shippers pointed out the projected population growth in Texas and strong intermodal rail connections as important strengths for Dallas.

3.6 Conclusions
Dallas is well positioned to take advantage of developing trends in shipper supply chains. Rising transportation and other costs place increased emphasis on DC proximity to consumption markets. As a major population center with good transport connections to other areas of Texas and neighboring states, a Dallas DC fits this network strategy. In particular, the combination of intermodal rail and logistics infrastructure at IIPOD is conducive to lowering trucking "last mile" costs for shippers managing inbound rail moves. Use of all-water services and sourcing from Latin America are also expected to support cargo flows through Gulf ports into the Dallas region.

Shipper comments suggest that the following actions could enhance Dallas as a center for cargo distribution:

- Establish intermodal rail connection with Houston - partner with UP or BNSF, or a shortline rail operator. Intermodal rail service from Houston would lower transportation costs in and out of Dallas
based DC's, thereby increasing the viability of a regional DC in Dallas. Reduced truck congestion, lower highway maintenance and reduced air pollution are additional benefits of this suggestion.

- Identify companies that ship cargo into Dallas from the West Coast, Houston, and other centers. There may be opportunities to consolidate cargo from different origins and cross-dock, or distribute regionally or nationally.

- Integrate "green technologies" into the development process. Environmental or "green" requirements are increasingly being required by warehouse and DC tenants.

- Applying an environmentally friendly development strategy and state of the art technology may provide market differentiation.
4. Port Industry
Texas has several ports that handle cargo for the Dallas region, Houston being the main container port. The ports are planning to invest in new container terminal facilities over the next decade or so to accommodate projected long term growth of container trade and to facilitate larger ships that are expected to transit the Panama Canal, once canal expansion is completed around 2015. The following discussion focuses on major trends in the container industry and developments at Houston and other ports.

4.1 Panama Canal Expansion
The Panama Canal is facing a capacity constraint over the next few years as the number of daily transits approaches the Canal’s capacity. The practical capacity of the Canal is 42 transits per day with some fluctuation around this level depending on vessel size mix, weather conditions, maintenance and repair schedules, and other operating factors. In fiscal year 2007, the Canal handled 14,721 transits (including 13,234 transits by oceangoing ships) or 40.3 transits per day. The Canal is projected to reach its capacity sometime in the 2009 to 2012 time period, based on the forecasts of demand prepared for the Panama Canal expansion project.

Completion of the expansion project in 2015 will provide sufficient transit capacity to support a possible twofold increase in Canal traffic. The actual increase in transit capacity will be influenced by the future vessel size mix, a mix with a higher percentage of larger vessels being less efficient than predominantly smaller vessels, and other operating factors. Shipping lines will be able to create new all-water deployments that take advantage of the economies of scale provided by larger and newer container ships. The expansion will allow transit by ships of up to 12,600 TEU with 50-foot draft and air draft of 200 feet, compared to the current approximate maximum of around 4,500 TEU (Figure 4-1). Approximately 95 percent of the container ships in operation today and 75 percent of the new ships currently on order will be able to transit the expanded Panama Canal. The changes to service structures and larger ship sizes will benefit those Gulf coast ports that have adequate terminal and port infrastructure (deep-draft channels and berths, cranes, inland connections, etc.).

Figure 4-1: Maximum Size of Panama Canal Container Ships

Source: TranSystems
4.3 Texas Port Developments

4.3.1 Houston
The port of Houston is the largest container port in Texas, accounting for 95 percent of total container throughput at Texas ports. In 2007, the port had total throughput of 1.8 million TEU. The port currently has two container terminals – Barbours Cut and Bayport – located on the Houston Ship Channel (Figure 4-3). The latter terminal is being developed in phases to accommodate growth of container throughput over the next decade. Houston currently offers approximately 1.9 million TEU of throughput capacity, which is projected to reach 3.7 million TEU around 2015 upon completion of all phases of the Bayport terminal project.

Figure 4-3: Map of Houston Container Terminals

Source: Port of Houston

Further expansion at Houston may take place on Pelican Island, at the mouth of Galveston Bay (Figure 4-4). This site would be developed to provide additional port capacity as the existing two terminals reach capacity. The site has waterfront land with deepwater suitable for the larger container ships (up to 50-ft draft) projected to transit the expanded Panama Canal. The Port of Houston has entered an agreement with the Port of Galveston to evaluate the potential for container terminal development on Pelican Island, with the Port of Houston likely to take the lead on development. The Port of Houston already operates the existing small Galveston container terminal under an agreement with the Port of Galveston.
4.3.2 Freeport

The Port of Freeport, located 63 miles south of Houston, handles a mixture of general cargo, project cargo and containers. In 2007, the port handled approximately 80,000 TEU of containerized cargo, including containerized imports of fruit from Central and South America. The port’s primary objective in the container sector is the development of a new container terminal (Figure 4-5) with throughput capacity of approximately 750,000 TEU. The port has started construction on the first phase of the terminal and is seeking a private sector terminal operator to enter a long-term agreement to manage the facility.
4.3.3 Corpus Christi
The Port of Corpus Christi is seeking a private sector terminal operator to enter into a long-term agreement to develop and manage the La Quinta container terminal project (Figure 4-6). The project is set on a site of 1,100 acres and would comprise a new container terminal with capacity of 1.5 million TEU at full build-out, an intermodal rail yard, and land for warehousing. The Port is targeting cargo generated by the San Antonio region and Northeast Mexico, as well as providing intermodal rail connections to inland markets.

Figure 4-6: La Quinta Terminal Site, Port of Corpus Christi

Source: Port of Corpus Christi
4.4 Conclusions
Trends in the container shipping industry – port diversification, Panama Canal expansion, etc. -- are expected to support long term growth of container throughput at ports in Texas. The economic, population, and trade trends discussed earlier are also anticipated to drive increased activity at the ports. Houston is expected to remain the dominant container port and it is planning long term investments in terminal capacity to match trade growth. Freeport and Corpus Christi want to expand or develop new container business, and they are seeking private sector terminal operators to participate in new terminal projects.

The projected long term growth of Texas container ports will drive requirements for logistics infrastructure and services to support the increased trade flows, both surrounding the ports and at inland locations such as Dallas. In addition, the increased cargo flows will place greater pressure on port infrastructure and environments, and encourage the development of means to expedite the flow of cargo to inland locations for processing and/or onward distribution. As a major transportation hub, the City of Dallas should monitor these port expansions and coordinate with the ports on common areas of interest – short-haul rail services, environmental impacts, and planning of transportation infrastructure.
5. Transportation Infrastructure

5.1 Highway Infrastructure
Dallas is located of several major highway corridors that carry freight in, out and through Texas. In addition, a number of planned projects would impact freight flows in the Dallas region. The following section reviews major highway corridors and planned projects, and their expected impact on Dallas.

5.1.1 Interstate Highways
I-35 is the most important corridor for U.S.-Mexico trade and within Texas I-35 ranks as first in total NAFTA vehicle miles traveled and carries a higher share of NAFTA trucks than other major NAFTA corridors in the state. I-35 commences in Laredo and runs north through San Antonio and Austin to Dallas (Figure 5-1). The segment between Laredo and San Antonio carries the highest average annual weekday trip volume of NAFTA trucks of any highway in Texas, San Antonio an important junction point between I-35 and I-10, which runs east-west across Texas. Dallas serves as the principal inland distribution center within Texas for NAFTA trade flowing along the I-35, cargo distributed for regional use and consolidated for export.

Figure 5-1: Interstate-35 Corridor

Source: "Texas NAFTA Study Update 2007", Texas DOT

I-20 is the main east-west trade corridor across the southern states, connecting Texas and Dallas to Atlanta (Figure 5-2). Given its geographic orientation and without a direct connection to the border, the I-20 is primarily a long-distance east-west route for NAFTA trade that feeds into and from the I-35, I-10 and other corridors. Within Texas, the I-20 section west of Dallas is the main corridor for shipments moving through the El Paso border gateway.

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3 Source: "Texas NAFTA Study Update 2007", Texas DOT
Figure 5-2: Interstate-20 Corridor

Source: "Texas NAFTA Study Update 2007", Texas DOT

I-30 is a short but intensively used corridor for NAFTA trade, extending from Dallas-Fort Worth northeast to Texarkana (Figure 5-3). This highway is part of a longer corridor that carries trade between Mexico and the Midwest.

Figure 5-3: Interstate-30 Corridor

Source: "Texas NAFTA Study Update 2007", Texas DOT
5.1.2 **South Outer Loop or Loop 9**
The concept of an "Outer Loop" freeway around the Dallas metropolitan area was first identified in the 1960s and has evolved over time into several different projects. The regional outer loop is illustrated in Figure 5-4, designed to provide a complete highway corridor around the Dallas-Fort Worth area by 2030. The initial segment proposed for development, with a target completion by 2015, is the South Outer Loop or Loop 9, which would provide improved connections between the I-35, I-44 and I-20 east. Loop 9 is also been studied as a potential connector or southern outer loop of the Trans-Texas corridor. Loop 9 would be beneficial to IIPOD, which is located between I-25 and I-40, south of I-20 and north of the proposed alignments for the Loop 9 project.

![Figure 5-4: Regional Outer Loop, Dallas-Fort Worth](image)

Source: Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Metropolitan Area

5.1.3 **Trans-Texas Corridor**
The Trans-Texas Corridor (TTC) is a proposed multi-use, statewide network of transportation routes in Texas that would incorporate existing and new highways, railways and utility right-of-ways. TTC would be developed over a 50 year period with each route developed based on state needs. Basic proposed alignments have been determined within a 10-mile channel; a network concept is illustrated in Figure 5-5. As proposed, each route will have:

- Separate lanes for passenger vehicles and large trucks.
- Freight railways.
- High-speed commuter railways.
• Infrastructure for utilities including water lines, oil and gas pipelines, and transmission lines for electricity, broadband and other telecommunications services.

Initial study is focused on the proposed TTC-35 corridor which generally parallels I-35 and extends approximately 600 miles long, extending from the border with Mexico north to Dallas-Fort Worth to Mexico. If developed, the corridor would also be integrated into proposed improved transportation corridors in Mexico, linking to Monterrey, Mexican Gulf coast ports and other centers.

Figure 5-5: TTC-35 and TTC-69 Conceptual Corridors

Source: Port of Corpus Christi
5.2 Rail Infrastructure
Texas has an extensive rail network connecting ports, border crossings, and inland hubs with local, regional and national markets. The network (Figure 5-6) is concentrated in the eastern portion of the state. Of the major railroads, UP has the largest network, followed by BNSF and KCS. There are also a number of small shortline operators. Dallas sits at the center of this rail system, acting as an important rail hub for UP and BNSF for east-west and north-south rail services. The following discussion focuses on developments related to rail network infrastructure and the major border crossings with Mexico. Evaluation of intermodal rail infrastructure in Dallas and other locations in Texas, and short-haul rail opportunities between Dallas and Texas ports, are covered in the Task 3 report on competition and market opportunities.

Figure 5-6: Texas Rail Network

Source: Texas Rail System Plan 2005, Texas Department of Transportation and TranSystems

5.2.1 UP Sunset Route
The Sunset rail corridor (Figure 5-7) is UP’s main east-west line from Southern California, and the ports of Los Angeles and Long Beach, across Arizona, New Mexico and into Texas. The line handles significant volumes of intermodal rail cargo to and from the Texas market, as well as other rail traffic. UP is engaged in a multi-year investment program to nearly double capacity of the corridor, principally through the provision of double-track along the route between Los Angeles and El Paso.

IPOD Study, March 2009
Task 2: Global, National & Regional
Transportation Influences
5.2.2 BNSF Transcon Route

Over the past decade, BNSF has been gradually double-tracking its 2,239 miles Transcon route between Los Angeles major markets in the Midwest and South (Figure 5-8). This project is nearing completion and is adding significant new capacity to the route. BNSF has also added a third track in several key locations.
5.2.3 Border Crossings
Texas has four major border crossings for rail traffic – Laredo, Eagle Pass, El Paso and Brownsville. As shown in Figure 5-9, the number of trains moving northbound through these border crossings has increased steadily since the late 1990s, a reflection of the expansion of NAFTA trade flows. The current rail infrastructure at the border crossings faces long term constraints due to projected trade growth and a desire to reduce the flow of commercial cargo traffic through the center of border cities. Long term solutions include relocation of rail away from city boundaries.

![Figure 5-9: Number of Northbound Trains by Border Crossing](image)

Source: Bureau of Transportation Statistics

KCS railroad has proposed a new rail bridge be constructed to the south of Laredo (Figure 5-10), along with new connecting rail lines, to replace the existing rail bridge and corridor through downtown Laredo. The proposed new connecting rail lines would link to the rail networks of KCS and UP. It is also suggested that the proposed rail and bridge corridor could also be a suitable alignment for a new highway corridor around Laredo. The proposed new rail bridge is anticipated to provide sufficient capacity to accommodate growth of train traffic beyond the year 2020.

Eagle Pass is UP’s second largest border gateway and is the interchange point between UP and Ferromex. UP has gradually been making improvements to the rail corridor to boost capacity. The improvements have included track work to boost train speeds. In addition, UP is undertaking a test of extended service hours in coordination with U.S. and Mexican customs. The test extends the hours that custom officials inspect rail cars, thus boosting the number of rail cars per day that can pass over the border. The City of El Paso is exploring different long term solutions to the growth of rail traffic through the city center. These include evaluation of new rail corridors around the city and the creation of an underpass corridor to carry mainlines through the city.
5.3 Conclusions
Dallas is situated on existing major rail and highway corridors for local, regional and NAFTA trade. In addition, proposed new projects such as Loop 9 and the Trans-Texas Corridors will provide additional rail and highway infrastructure for freight movements in, out and through Dallas. IIPOD is well positioned to benefit from the existing transportation infrastructure and proposed improvements to infrastructure.