



# CSX REAL PROPERTY INC.

## DEVELOPMENT OF AN INTEGRATED LOGISTICS CENTER IN WINTER HAVEN, FLORIDA

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AN INTEGRATED LOGISTICS CENTER  
IN WINTER HAVEN, FLORIDA**

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*CSX Intermodal train moving south of Jacksonville, Fla., en route to central Florida*

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## EXECUTIVE SUMMARY

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- A number of factors have led to the unprecedented surge in the demand for rail transport – the boom in international trade, modern rail equipment (doublestack containers), major highway congestion and the rising costs and cultural changes facing the trucking industry (higher insurance, equipment and fuel costs, changes in hours of service allowed.)
- Intermodal transportation – the movement of consumer products and parcels using a combination of truck-to-rail-to-truck transfer – is the fastest growing segment of the rail industry. In addition to the efficiency of intermodal transportation, a single intermodal train can remove as many as 300 trucks off the highways, thereby having a possible impact on highway congestion. Importantly, intermodal transportation often involves the transfer of international containers from ships arriving at the nation’s ports for movement inland via rail.
- A number of advanced intermodal facilities – called integrated logistics centers (ILCs) – have, and are, being developed to spur predictable economic development around a central intermodal facility. Such facilities have generated significant and sustained economic development, such as at AllianceTexas, where 20,000 jobs and \$23 billion in economic impacts were generated in a 13-year period, on a 2,500 acre development.
- A smaller 1,250-acre ILC is proposed for Winter Haven, Florida – the first such facility in the southeastern United States – to accommodate the projected large growth in Florida’s population and demand for consumer products. It is estimated that such a facility at full build-out would create 8,500 annual full-time jobs in Winter Haven and Polk County, generate more than \$10 billion in economic development and activity, and add \$900 million in state and federal tax revenue. (The economic development and tax revenue projections are cumulative over 10 years, based on assumptions outlined in Section 3.3.) At full build-out, the ILC is projected to be comprised of 3 million square feet of warehouse, 1.5 million square feet of industrial sites, and 0.5 million square feet of office space. The total annual payroll of the 8,500 jobs created by the ILC (including benefits) would be \$282.2 million.



- Florida is highly susceptible to hurricanes and Winter Haven has been identified as a Host City to shelter hurricane victims. In the event of such a storm, an ILC located in or near an area prone to hurricanes can be used for emergency recovery. For instance, the North Carolina Global TransPark served as a logistical staging area for relief operations following Hurricane Floyd in October 1999, providing the public water, food and other essential items in the most time-sensitive manner possible.
- The sponsor of the Winter Haven ILC, Jacksonville-based CSX Corporation, has been identified by the National Cooperative Highway Research Program (NCHRP) as a company that has successfully implemented policies for integrating intermodal facilities and operations with community goals. The company has a record of working cooperatively with local communities to ensure its transportation facilities meet community standards and individual community needs.



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## 1. INTRODUCTION

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With its highways, railways, airways and waterways, the nation's freight transportation system plays a critical role in an increasingly global economy. Though trucks still move the majority of the nation's freight, the demand for rail freight transportation is dramatically on the rise.

According to the Association of American Railroads (AAR), rail traffic set a new record in 2004 with an estimated 1.61 trillion ton-miles, a nearly 4 percent increase over 2003. Intermodal traffic itself was up by 10.4 percent.<sup>1</sup> "Intermodal" refers to any shipments that are carried by more than one mode, such as rail and truck. Intermodal rail is typically limited to the carriage of truck trailers (with wheels) and containers (without wheels).

A number of reasons can be given to explain this unprecedented surge in the demand for rail transport: the boom in international trade (especially with China and other Asian countries), technological advances in railroad equipment (such as doublestack rail technology), highway congestion (and its related social, economic and environmental costs), and the rising costs and cultural changes facing the trucking industry.

The success of freight rail nationwide relies primarily on its infrastructure, and particularly its network of intermodal facilities. In general, the public tends to have mixed feelings regarding rail facilities that generally move bulk commodities: on one hand, some associate them with noise, pollution, safety hazards and delays at rail crossings; on the other hand, some see them as a source for economic development and job creation. However, a new generation of intermodal facilities, often referred to as "integrated logistics centers (ILCs)" has emerged during the past decade. These facilities are different from traditional rail yards, handle higher-end consumer products, and can not only foster economic activity but also generate positive developmental and economic effects for the community at large.

The purpose of this report is to assess the potential economic and community benefits resulting from the construction and operation of an ILC in Winter Haven. The report is organized into four chapters. After this brief introduction, Chapter 2



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<sup>1</sup> Congressional Budget Office, *Freight Rail Transportation: A Review of the 2004 Experience*, May 2005, p.13.

provides a description and a comparison of existing facilities in the United States. Chapter 3 examines the various benefits associated with them, and estimates the economic impacts of the construction and operation of an ILC in Winter Haven. Chapter 4 will discuss steps that are generally undertaken in a successful public private partnership to help address community needs and concerns.

In addition, the report comprises several appendices. A table summarizing the benefits of ILCs is included in Appendix A. A comprehensive list of practices implemented to balance freight transportation facilities and operations with community issues is available in Appendix B. References and data sources used throughout the study are provided in Appendix C.



*CSX Intermodal terminal at 59th Street in Chicago*

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## 2. DESCRIPTION AND COMPARATIVE ANALYSIS OF EXISTING INTEGRATED LOGISTICS CENTERS

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This chapter presents the results of a review and comparative analysis of existing integrated logistics centers in the United States. Section 2.1 defines the concept of “integrated logistics center” and describes its key features. Section 2.2 provides a sample list of existing or planned facilities, and Section 2.3 focuses on a particular example, AllianceTexas.

### 2.1 Definition and Key Features

The concept of “integrated logistics center” (also called “logistics park” or “freight village”) is rather recent in the United States. It has, however, a longer history in Western Europe, where the terminology originated in the 1970s. An integrated logistics center (ILC) can be defined as “the hub of a specific area where all the activities relating to transport, logistics and goods distribution are carried out by various operators.”<sup>2</sup>



*CenterPoint Intermodal Center – Elwood, Ill.*

Overall, an ILC serves two major goals:

- Bring together the flow of the freight transport managed by transportation and logistics operators to reduce costs and increase productivity; and
- Spur transportation and distribution-related economic activity drawn to the area because of the consumer-related nature of intermodal freight. As discussed in Sec. 2.3 and 3.2, the intermodal terminal at an ILC serves as a magnet to draw economic development by companies that store, distribute or offer services related in the logistics chain movement of consumer products (often in large quantities) intermodally.

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<sup>2</sup> Europlatforms EEIG, *Logistics Centres, Directions for Use*, January 2004, p. 3.

Typically, an ILC comprises, at a minimum, several warehouses and an intermodal terminal, where freight is conveyed from one mode of transportation to another (train-to-truck or truck-to-train, for instance). It often houses distribution, manufacturing and processing sites as well as repair buildings (to ensure efficient, uninterrupted operations spaced throughout the day). Depending on its location and the range of its activities, an ILC can also provide customs services.



*Large-size warehouses for logistical activities*



*BNSF Logistics Park-AllianceTexas*

This “all-in-one” concept aims at increasing reliability, efficiency/synergy and providing a way to speed up freight movement, handle more freight and reduce a wide array of costs. More precisely, an ILC will provide the following transport system effects to the firms: optimization of the logistics chain, optimization of truck utilization, optimization of warehouse utilization, optimization of labor force resources, as well as a decrease in logistics and transport costs, a decrease in personnel costs and an increase in the volume of freight transported<sup>3</sup>. For instance, with direct rail access, shippers eliminate 100 percent of the costs on drayage, or the movement of freight from rail by truck to another location.

To be successful, an ILC should be administered by a single and neutral legal entity. The private public partnership is the most widespread and efficient organizational structure for an ILC, chiefly because the sheer size of the project requires both a great investment effort and the intervention of local authorities (ILCs often are part of local land use/transportation plans). The most successful ILC public private partnerships are characterized by detailed joint planning, a financial sharing of costs and assistance by the public agency in seeking permitting, rezoning, highway access and other necessary site-related needs and approvals.

Contrary to traditional rail yards, ILCs are better integrated in the transportation logistics chain and the production processes of firms. Rail yards also are different from ILCs with respect to the type of freight service provided and the nature of the commodities transported. Rail yards typically are served by bulk unit trains and mixed carload trains. Bulk unit trains move high volumes of a single commodity such as coal, grain, minerals and waste; mixed carload trains move various commodities, including chemicals, food products, forest products, waste and scrap.

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<sup>3</sup> Yevdokimov, Yuri V., “Measuring Economic Benefits of Intermodal Transportation,” *Transportation Law Journal*, June 2000.

By contrast, ILCs are served primarily by intermodal trains carrying truck trailers and containers containing consumer goods and higher-value, lower-weight commodities.

## 2.2 Integrated Logistics Centers in the United States

As mentioned above, integrated logistics centers appeared only recently in the United States. Most of the existing facilities have been built during the last decade. ILCs are generally located in areas of the country where there is a concentration of population density and strong demand for the movement, storage and distribution of large volumes of consumer products. As such, ILCs to date have been principally located in Texas, Illinois and California. The proposed ILC in Winter Haven would be the first in the Southeast, serving a state that is projected to become the nation's third most populous by 2010.

Table 1 below shows a sample of existing and planned/under construction logistics parks, which are reviewed in this report. The number of logistics parks currently planned or under construction is a clear sign of both the need for and the success of such facilities throughout the country.

**Table 1: Sample of Existing and Planned/Under Construction Facilities in the United States**

| <b>EXISTING FACILITIES</b>                             |                    |                     |                       |
|--|--------------------|---------------------|-----------------------|
| <b>Name</b>  | <b>Location</b>    | <b>Opening Date</b> | <b>Operator</b>       |
| Logistics Park-AllianceTexas (AllianceTexas)           | Fort Worth, TX     | 1994                | BNSF                  |
| Logistics Park-Chicago (CenterPoint Intermodal Center) | Elwood, IL         | October 2002        | BNSF                  |
| Global III (CenterPoint Intermodal Center - Rochelle)  | Rochelle, IL       | August 2003         | UPRR                  |
| Dallas Intermodal Terminal (DIT)                       | Wilmer, TX         | August 2005         | UPRR                  |
| Mesquite Intermodal Facility (Skyline Business Park)   | Mesquite, TX       | *                   | UPRR                  |
| <b>PLANNED OR UNDER CONSTRUCTION FACILITIES</b>        |                    |                     |                       |
| <b>Name</b>  | <b>Location</b>    | <b>Opening Date</b> | <b>Operator</b>       |
| Salt Lake City Intermodal Facility                     | Salt Lake City, UT | N/A                 | UPRR                  |
| California Integrated Logistics Center                 | Shafter, CA        | Late 2005           | NW Container Services |
| Rickenbacker Intermodal Facility                       | Columbus, OH       | 2006                | NS                    |

\* The intermodal operation was built before the Skyline Business Park, which opened in 2001. Note: BNSF = Burlington Northern Santa Fe UPRR = Union Pacific Railroad NS = Norfolk Southern

## 2.3 A Success Story: AllianceTexas

AllianceTexas, is one of the most successful logistics parks in the United States.<sup>4</sup> It is also one of the oldest and most studied and has been heralded as a model that could be followed for the construction of an ILC in Winter Haven.

AllianceTexas is a 17,000-acre, mixed-use, master-planned development located in Fort Worth, Texas. It began in December 1989 as a combined effort between the City of Fort Worth, the Federal Aviation Administration and Hillwood for the construction of Fort Worth Alliance Airport, the world's first purely industrial airport.

AllianceTexas consists of three distinctive developments, among them an 11,600-acre logistics park providing a full range of transportation options: intermodal, automotive, transload and carload service with distribution and warehousing. To date, the park has attracted more than 140 companies, including 62 industry leaders from the Fortune 500, the Global 500 or the Forbes List of Top Private Companies (Ryder/Hewlett-Packard, ExxonMobil, FedEx, Honeywell and Motorola, to cite a few).

One of the nation's largest intermodal hubs, AllianceTexas integrates direct rail, intermodal, truck and transload services with distribution and warehousing within close proximity of one another and to one or more blocks of developable land for distribution centers. This creates the density needed to build one train, rather than several groups of rail cars. Shippers benefit from more reliable and consistent service with a reduction in operating costs.

Originally built as an automotive facility in 1990, AllianceTexas expanded in 1994 to include an intermodal facility operated by the Burlington Northern Santa Fe Railway (BNSF). The BNSF facility has grown from handling 120,000 lifts in 1994 to 500,000 lifts this year (intermodal volumes are measured by the number of trailers or containers that are "lifted" on or off a train). In November 2004 BNSF expanded its intermodal terminal by adding 327 acres of direct rail access. With the new expansion, BNSF expects to reach one million lifts per year – a volume that is currently seen only at large seaside ports such as the Port of Los Angeles.



AllianceTexas has become one of the most successful public private partnerships in the nation, and it has served as a model for other integrated logistics centers. It is estimated that from 1990 to 2003 AllianceTexas generated a cumulative economic impact of \$23 billion and created more than 20,000 jobs. Property taxes paid to its host cities, counties and school districts totaled \$313 million during the same period.

*The 750-acre BNSF AllianceTexas ranks as one of the largest U.S. intermodal facilities*

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<sup>4</sup> A majority of the information reported in this section can be found on the AllianceTexas website at <http://www.alliancetexas.com>.

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## 3. BENEFITS OF INTEGRATED LOGISTICS CENTERS

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This chapter presents the benefits associated with integrated logistics centers. The first section explains the different types of benefits – namely economic impacts, user benefits and social impacts. The second section presents a comprehensive outline of the benefits with examples from a review of case studies. The last section reports the results of an economic impact analysis of the construction and operation of an ILC in Winter Haven.

### 3.1 Economic Value, User Benefits and Social Impacts

The most commonly assessed benefit category in existing case studies is the economic value (or the economic impacts) of integrated logistics centers. ILCs produce both short-term impacts (during the construction phase) and long-term impacts (during the operation phase). A comprehensive economic impact analysis should thus estimate (and differentiate between) these impacts. Economic impacts are measured in terms of business output (or volume of sales), value added (i.e., employee compensation and property income), employment, labor income and tax revenue (at the local, state and federal levels).

Economic impacts can be defined as the effects on the level of economic activity in a given area. Typically, economic impact analysis involves the estimation of three types of spending/production activity:

- *Direct effects* are the changes in local business activity occurring as a direct consequence of companies located in the logistics parks, including all construction activities;
- *Indirect effects* are the result of purchases by local firms that are the direct suppliers to the directly affected companies; and
- *Induced effects* are the changes in local business activity resulting from personal household spending for goods and services – including employees of directly and indirectly affected businesses.

Of the three types of effects, induced effects are typically the largest. The total economic value is the sum of the direct, indirect and induced effects of the integrated logistics center being evaluated.

A review of the literature on the economic impacts resulting from integrated logistics centers was conducted. The findings are summarized in Table 2 on the following page.

**Table 2: Economic Impacts Resulting From Integrated Logistics Centers**

**EXISTING FACILITIES**

| Name  | Acreage   | Opening Date | Operator (1) | Economic Impacts  |
|---|---|--------------|--------------|---|
| Logistics Park-Alliance Texas<br>(AllianceTexas)<br>Fort Worth, TX                  | 11,600 (park-total)<br>1,700 (park Developed)<br>750 (facility) (2) | 1994         | BNSF         | Number of companies (2005): 140 (3)<br>Output (1990-2003): \$23.2 billion<br>Jobs (1990-2003): 20,000<br>Property Taxes (1990-2003): \$313 billion        |
| Mesquite Intermodal Facility (4)<br>(CenterPoint Intermodal Center)<br>Mesquite, TX | 155 (facility)  | 1997 (5)     | UPRR         | Jobs (1995-2002): 475<br>Output (1995-2002): \$280 billion  |
| Logistics Park-Chicago<br>Elwood, IL  | 1,600 (park - total)<br>990 (park - developed)<br>625 (facility)    | 10/2002      | BNSF         | Jobs (upon completion): 8,000-12,000<br>Property taxes (upon completion): \$27 million per year<br>Sales tax (construction materials cost): \$108 million |
| Global III (6)<br>Rochelle, IL  | 1,230 (facility - total)<br>700 (facility - developed)              | 8/2003       | UPRR         | Output (10-year period): \$2.8 billion (7)  |

**FACILITIES UNDER CONSTRUCTION**

| Name  | Acreage        | Opening Date | Operator                    | Economic Impacts  |
|---|----------------|--------------|-----------------------------|---|
| California Integrated Logistics Center<br>Shafter, CA | n/a            | 2005         | NW<br>Container<br>Services | Jobs (upon completion): 800-1,000<br>Labor income (upon completion): \$40 million per year  |
| Rickerbacker Intermodal Facility<br>Columbus, OH      | 300 (facility) | 2006         | NS                          | Output (30-year period): \$15.1 billion<br>Direct tax revenue (30-year period): \$805 million<br>Indirect tax revenue (30-year period): \$1.26 billion<br>Direct and indirect jobs (30-year period): 20,400 |

**Notes:**

Economic impacts are estimated for the entire logistics park, and not just the intermodal facility

- (1) BNSF= Burlington Northern Santa Fe  
UPRR= Union Pacific Railroad  
NS= Norfolk Southern

(2) The estimate does not include the 327-acre expansion announced in November 2004

(3) Impacts are estimated for the entire AllianceTexas development (a 17,000-acre development, of which 4,000 acres are developed), which includes the logistics park

(4) Adjacent to the intermodal facility is the Skyline Business Park, a 94-acre industrial park which opened in 2001

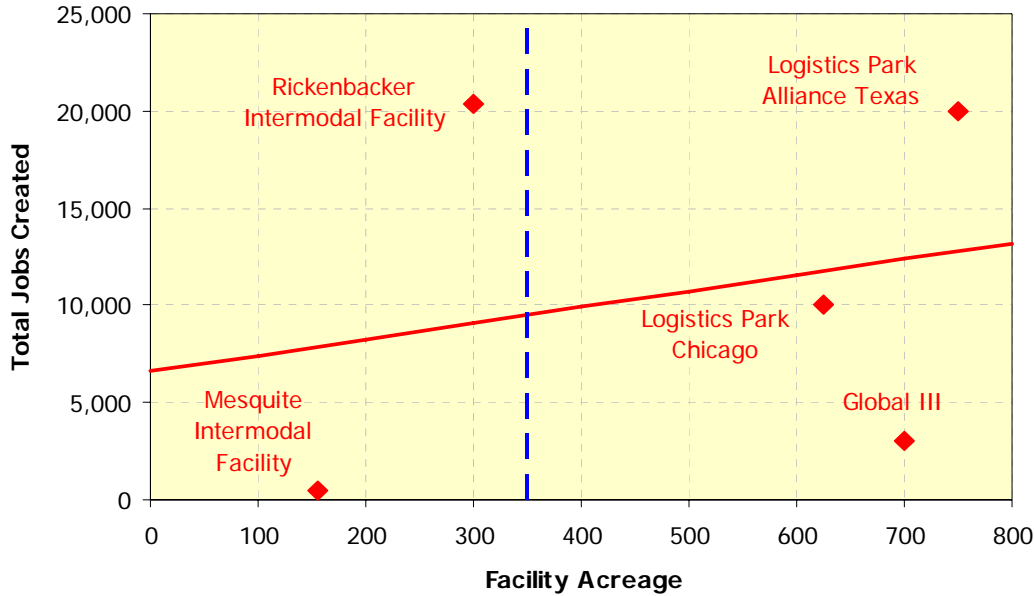
(5) Year of major expansion

(6) Adjacent to the intermodal facility is the CenterPoint Intermodal Center - Rochelle, a 362-acre industrial park which opened in 2004

(7) Preliminary estimate; an economic impact study is under way

Figure 1 below shows the number of jobs created and the facility (developed) acreage for a sample of ILCs. The relationship between the two variables is graphically represented by means of a regression line (red solid line). One can thus derive from the graph the expected number of jobs created by an ILC, given the facility acreage. For example, a 350-acre facility would be expected to create approximately 9,000 jobs (intersection of the red solid line with the blue dash-dotted line). As outlined in Section 3.3, a 300-acre ILC at Winter Haven would be expected to create 8,500 jobs.

**Figure 1: Intermodal Facility Acreage and Job Creation**



Beyond these well-established and measured economic impacts, logistics parks generate other positive effects on industries and the community at large, which are commonly referred to as *user benefits* and *social impacts*. Economic impacts are different from user benefits (of a particular facility) and broader social impacts – even though user benefits and social impacts include the dollar valuation of changes in amenity or quality of life factors such as air quality, safety and security. User benefits are usually thought of in terms of the impact on users of a particular facility; in the case of an ILC, the benefits associated with a more efficient production process (e.g., increase in freight volume and reduction in logistics cost). Social impacts are the benefits enjoyed by the local community (i.e., users and non-users of the logistics park) such as environmental impacts and accident cost savings.

Also, key features of ILCs may significantly increase benefits usually generated by intermodal transportation. For instance, most of the recent logistics parks are using high-tech, biometric secured automated gate system (AGS) that decrease truck processing from a national average of four minutes to as little as 30 to 90 seconds, thus reducing truck idling and emissions. On the other hand, while some benefits can be attributed to intermodal transportation in general (such as congestion relief, environment and safety), others are attributable to ILCs only (security, redevelopment and hurricane relief).

Appendix A provides a list of benefit and impact metrics associated with integrated logistics centers. The metrics are arranged by broader benefit category (environment, safety, etc.). The

table also shows whether or not the metrics can be ultimately expressed in dollar value and indicates the extent to which these metrics are documented in existing case studies.

### 3.2 ILC Benefits

As mentioned above, economic impacts are typically measured in terms of output, value added, labor income, employment and tax revenue. In addition, logistics parks generate a number of user benefits and social impacts that are described in detail below. A summary of all benefit and impact metrics identified in this study is also provided in Appendix A. The metrics are arranged by broader benefit category (environment, safety, etc.). The table also shows whether or not the metrics can be ultimately expressed in dollar value and indicates the extent to which these metrics are documented in case studies.



*Warehouses with raised docking bays*

#### *Economic Development*

Several logistics parks were redevelopment projects originally. Since the early 1990s, the United States Army has been re-examining its installations to identify underutilized land and turn it back to more productive uses. A successful example of redevelopment and industrial conversion is the former Joliet arsenal in Illinois. The 27,000-acre military property was used for the manufacturing of munitions since the 1940s. It was one of the largest employers in the Chicago metropolitan area, with more than 12,000 Illinois residents on its payroll during peak production years. In 1976, the Joliet arsenal was closed, and the offices and factories were abandoned. In 1995, the U.S. Congress passed legislation to transfer the land for remediation. Finally, in 2000 the Army transferred 2,032 acres to CenterPoint Properties, a Chicago-based industrial real-estate company, to transform the former arsenal into an intermodal facility (which opened in October 2002 and is now operated by BNSF) and an industrial business park. To date, the logistics park is more than 60 percent built out. According to a University of Illinois study, upon its completion, CenterPoint Intermodal Center is projected to create more than 8,000 new jobs and generate as much as \$27 million annually in property tax revenue to local governments.

## ***Congestion***

More than 75 percent of U.S. domestic freight tonnage is currently conveyed by trucks. Trucks are often regarded as a significant source of traffic congestion. The problem is most acute in congested areas with high level of economic activities, where most of the freeways are at (or beyond) capacity during peak periods. On most freeways, an estimated 30 percent to 60 percent of the capacity is actually used by trucks. Also, truck-related accidents generate serious traffic congestion because they involve a larger number of lanes blocked or closed.

Freight rail combined with grade separation provides a solution to traffic congestion and improved reliability. Each intermodal doublestack train can remove as many as 300 trucks from the nation's interstate highways. It is estimated that the future California integrated logistics center in Shafter will eliminate millions of truck miles annually from the much-congested Interstate 5, between the Port of Oakland and the ports of Los Angeles and Long Beach.<sup>5</sup>

## ***Hurricane Relief***

In the event of a hurricane, ILCs located in/near coastal areas that are prone to hurricanes could be used for emergency recovery. For instance, the North Carolina Global TransPark served as a logistical staging area for relief operations following Hurricane Floyd in October 1999, providing the public water, food and other essential items in the most time-sensitive manner possible. Inasmuch as Florida is highly susceptible to hurricanes and Winter Haven has been identified as a Host City to shelter hurricane victims, an ILC offers the potential for significant public benefits.

## ***Environment***

Air quality preservation looms at the most significant challenge for highway freight movement. Trucks predominantly use diesel fuels, a major source of NO<sub>2</sub> (an ozone precursor) and the primary mobile source of particulate matter. In general, train movements benefit the public by offering a cleaner alternative to trucks by using less fuel and emitting less pollution (per ton of freight transported).



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<sup>5</sup> Los Angeles County Metropolitan Transportation Authority, *Southern California Freight Management Case Study*, prepared for the Office of the Secretary of Transportation and the U.S. Department of Transportation, January 2002.

## ***Safety***

Safety is one of the top freight transportation priorities, because the interaction of passengers and freight on the transportation network creates significant safety concerns. There are far fewer total fatalities each year from truck-related accidents than from passenger-vehicle accidents. However, truck-related accidents tend to be more severe: they involve a higher incidence of fatality, property damage and economic loss than non-truck related accidents. By comparison, freight trains have a lower accident rate than trucks. Also, wear and tear on highways as a result of truck traffic is a significant source of accidents. Therefore, shifting from truck to rail transportation provides significant accident cost savings and substantial benefits to the public.

## ***Security***

In the aftermath of 9/11, transportation security has become a major public concern and preoccupation for the U.S. Department of Transportation. The inspection of containers at U.S. ports of entry has increased dramatically. New intermodal facilities equipped with state-of-the-art security fencing, lighting and full gate inspections allow for improving security without hindering freight movement. For instance, at Union Pacific's Global III near Chicago, trucks gain access to the facility via high-tech, biometric secured automated gate system (AGS). Optical resolution is used to identify containers on trucks, and drivers are identified using digital scans of two fingers. The entrance lanes are also equipped with tire-flattening spikes that are operated in case of unauthorized entry. A truck entering or leaving the facility is stopped at the gate for less than two minutes, as compared to a national average of four minutes.

## ***Production Process***

Intermodal transportation changes the way firms do business and affects their production process, all of which provide public *and* private benefits. The overall impact can be divided into four components: an increase in the volume of transportation, a reduction in logistic costs, economies of scale associated with transportation network expansion and better accessibility to input and output markets.

For instance, after joining AllianceTexas at Fort Worth in 1994, BNSF nearly doubled its volume of throughput at the intermodal facility in five years. Containerization of commodities being transported plus hubbing or cargo consolidation at the intermodal facility resulted in longer trains with higher frequency, taking trucks off the highway. Day-to-day operations at the intermodal facility are managed by the Optimization Alternatives Strategic Intermodal Scheduler (OASIS) computer system, in order to maximize terminal efficiencies and provide customers visibility of their shipments at all times (providing competitive advantages for local companies).



CSX Intermodal Terminal at 59<sup>th</sup> Street, Chicago



Aerial view

### 3.3 Economic Impact Analysis of an Integrated Logistics Center in Winter Haven and Polk County

An economic impact analysis was conducted to evaluate the incremental economic growth and additions to the tax base from a 1,250-acre integrated logistics center (including a 300-acre intermodal facility) located in Winter Haven. (Depending on the final design, the facility also could provide for the distribution of new cars to Florida dealerships).

The economic impacts were first estimated for the construction and operation of an intermodal facility using IMPLAN (IMPact analysis PLANning), an input-output model that has been extensively used in regional land use planning for nearly two decades.<sup>6</sup> The impacts were assessed for Winter Haven and Polk County with the most recent available data (2002).<sup>7</sup>

Three scenarios were considered: a pessimistic scenario, a most likely scenario and an optimistic scenario. A number of assumptions were made under each scenario pertaining to (i) the construction period of the intermodal facility, (ii) the total construction cost (including labor and

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<sup>6</sup> An input-output model calculates impact multipliers, which are then used to estimate indirect and induced effects. Multipliers can be expressed in terms of output or jobs. An output multiplier is the total increase in business output (sales) for all industries, per dollar of additional final demand (purchases) of a given industry. A job multiplier is the total increase in jobs for all industries, per new job created in a given industry. The higher the multiplier the greater is the total economic response to the initial direct effect.

<sup>7</sup> During the impact analysis, two adjustments were made:

- Since the IMPLAN numbers were originally expressed in 2002 dollars, they were adjusted for inflation during the analysis to express the results in 2005 dollars.
- Social Accounting Matrix (Type SAM) multipliers used for estimating indirect and induced effects were modified with Regional Purchase Coefficients (RPC) to ensure that imports into the county would not be counted.

RPCs indicate what fraction of total demand for goods and services within a region (both by business and household) is satisfied from within the region; all remaining demand is satisfied by imports, which provide no direct economic benefit to the region. In other words, they filter-out economic leakages from the region.

equipment), (iii) the percentage of total construction expenditures that are occurring in Polk County, and (iv) the number of employees in the facility during the first year of operation. The model assumptions were based on a review of existing case studies (Table 2 provides a summary of economic impacts for a sample of existing or under construction ILCs). The table below summarizes the model assumptions for each scenario.

**Table 3: Assumptions Pertaining to the Construction and Year-1 Operation of an Intermodal Facility in Polk County, Fla.**

| Input  | Most Likely | Low | High  |
|--|-------------|-----|-------|
| Construction period, years <sup>8</sup>  | 1.5         | 1.5 | 1.5   |
| Total construction cost, \$ millions   | 112         | 101 | 123   |
| Construction expenditures, % local (Polk County)   | 67          | 50  | 95    |
| Number of jobs during construction period (see Figure 2 for job-per-year breakdown)        | 1,370       | 930 | 2,150 |
| Number of employees working at the intermodal facility (1 <sup>st</sup> year of operation) | 200         | 150 | 250   |

Economic impacts were measured in terms of output (or total volume of sales), value added (i.e., employee compensation and business owner income after expenses), employment, and tax revenue<sup>9</sup> (at the local, state and federal levels).

Under the most likely scenario, the output impact of building the intermodal facility in Polk County is estimated at \$112 million during the construction period. The value added impact represents approximately 54 percent of total output. The proposed project is also expected to generate \$9 million in tax revenue, a third of which will be collected by local/state governments. Table 3 below shows the results by impact category and scenario. Note that all figures are expressed in millions of 2005 dollars.

**Table 4: Short-Term Economic Impacts of Construction Expenditures**

*Please note: In the table below, "Output" refers to all of the costs of materials and services associated with the construction of the terminal. "Value Added" refers to the compensation paid to employees involved in the construction of the terminal, and the income (after expenses) of the business owners involved in the construction of the terminal.*

| Impact Category           | Most Likely | Low  | High  |
|---------------------------|-------------|------|-------|
| Output (\$ Millions)      | \$112       | \$75 | \$175 |
| Value Added (\$ Millions) | \$61        | \$41 | \$96  |
| Taxes (\$ Millions)       | \$9         | \$6  | \$14  |
| State/Local               | \$3         | \$2  | \$5   |
| Federal                   | \$6         | \$4  | \$9   |

<sup>8</sup> The construction period was assumed constant (18 months) for all three scenarios. Shortening or extending the construction period will not affect the magnitude of economic impacts. It will merely accelerate or delay their realization.

<sup>9</sup> Includes corporate profit taxes, indirect business taxes, personal taxes and social insurance taxes.

For the most likely scenario, the output impact is broken down as follows: \$67 million in direct effects, \$17 million in indirect effects and \$28 million in induced effects.<sup>10</sup> Table 5 below shows the results by type of effect for each scenario.

**Table 5: Short-Term Output and Value-Added Impacts of Construction Expenditures**

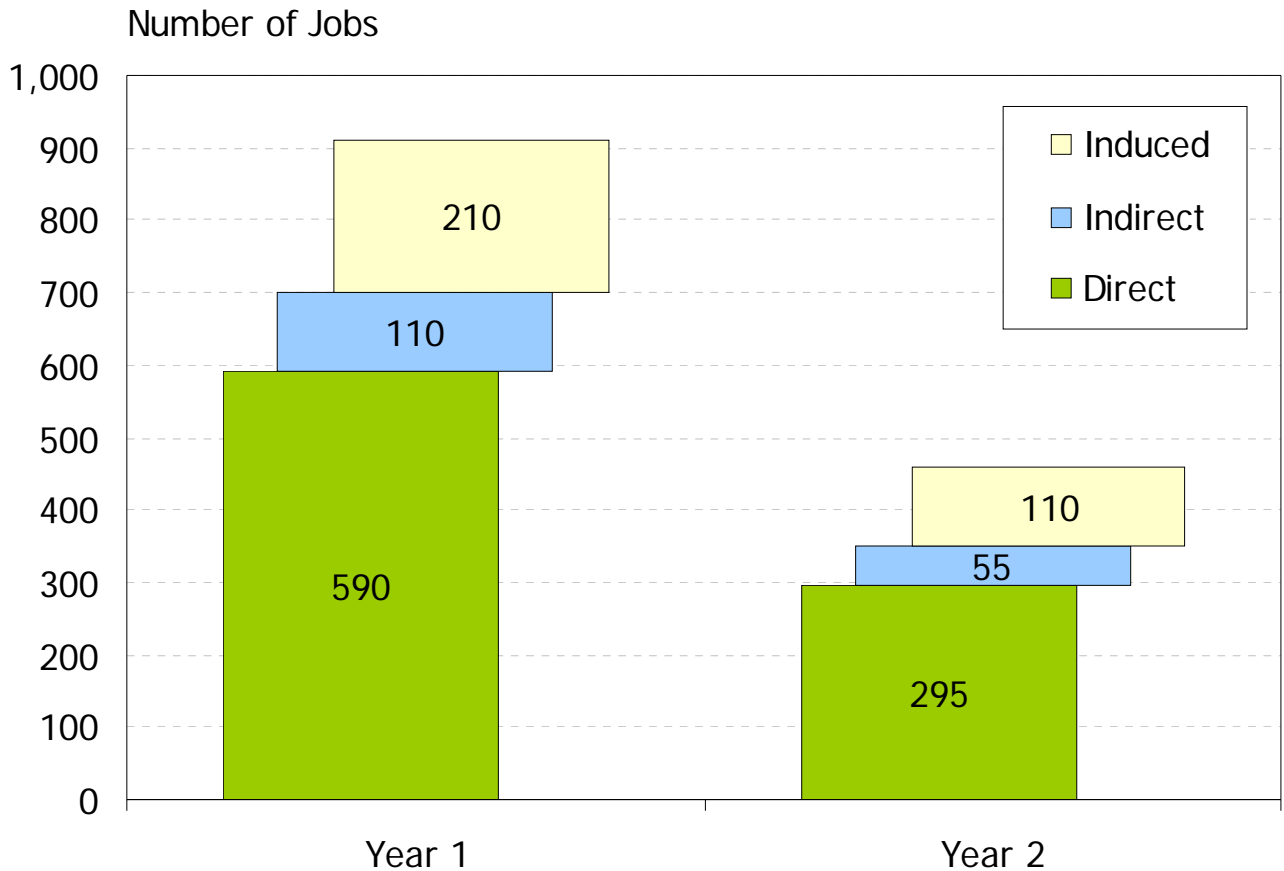
*Please note: In the table below, "Direct Output" refers to the costs of materials and services directly related to the construction of the terminal, "Direct Value Added" refers to the compensation paid to employees directly involved in the construction of the terminal and the income (after expenses) of the business owners directly involved in the construction of the terminal. "Indirect Output" refers to the cost of materials and services of activities not directly associated with the construction of the terminal, but caused because of the construction of the terminal (for example, a company wins a big contract hauling steel to the terminal and therefore has to buy a fleet of new trucks to handle its increased business; the cost of the trucks is "Indirect Output"); "Indirect Value Added" refers to the compensation paid to employees indirectly associated with the construction of the terminal (for example, compensation paid to the truck drivers delivering steel to the terminal) and the business owner income(after expenses) of business owners indirectly associated with the construction of the terminal (for example, the income realized by the truck dealer who sold the trucks.) "Induced Output" refers to the cost of materials and services that are not directly or indirectly associated with the construction of the terminal but occur because of the construction activity (for example, the McDonald's located down the street from the terminal does 40% more business during the construction period); "Induced Value Added" refers to the compensation paid to employees not directly or indirectly associated with the terminal construction (for example, the payroll for three new lunch-hour employees McDonald's hired) and the business owner income (after expenses) of such companies (for example, increased income for McDonald's.)*

| <b>Impact Category</b>    | <b>Direct</b> | <b>Indirect</b> | <b>Induced</b> | <b>Total</b> |
|---------------------------|---------------|-----------------|----------------|--------------|
| <b>Most Likely</b>        |               |                 |                |              |
| Output (\$ Millions)      | \$67          | \$17            | \$28           | \$112        |
| Value Added (\$ Millions) | \$33          | \$10            | \$17           | \$61         |
| <b>Low</b>                |               |                 |                |              |
| Output (\$ Millions)      | \$45          | \$11            | \$19           | \$75         |
| Value Added (\$ Millions) | \$23          | \$7             | \$12           | \$41         |
| <b>High</b>               |               |                 |                |              |
| Output (\$ Millions)      | \$105         | \$27            | \$44           | \$175        |
| Value Added (\$ Millions) | \$52          | \$16            | \$27           | \$96         |

<sup>10</sup> See Section 3.1 for a definition of indirect and induced impacts.

As shown in Figure 2 below, the project is also expected to generate approximately 910 jobs during year 1 of the construction period and an additional 460 jobs during year 2. A majority of these jobs (65 percent) are the direct effect of construction expenditures.

**Figure 2: Construction Expenditures Employment Impact, Most Likely Outcomes**



The economic impacts resulting from the operation of the intermodal facility were calculated in the same way with IMPLAN. Under the most likely scenario, the output impact of operating the intermodal facility is estimated annually at \$146 million, broken down as follows: \$92 million in direct effects, \$18 million in indirect effects and \$36 million in induced effects. The facility is also expected to create 734 jobs<sup>11</sup> in Polk County and generate \$13 million in tax revenue (\$6 million in state/local taxes and \$7 million in federal taxes). The total economic impacts, for each scenario, are summarized in Table 6. Direct, indirect and induced effects are itemized in Table 7 on the following page.

<sup>11</sup> This estimate includes the 200 jobs assumed for the operation of the intermodal facility.

**Table 6: Long-Term Economic Impacts of Operation Expenditures (Annually Recurring) From the Intermodal Facility Itself**

*Please note: In the table below, "Output" refers to the revenue generated by the services provided at the intermodal facility (for example, revenue generated by moving containers from the terminal via rail or storage fees for containers sitting at the terminal); "Value Added" refers to the compensation paid to employees working at the intermodal facility and the business owner income (after expenses) of the intermodal terminal operator.*

| Impact Category            | Most Likely | Low   | High  |
|----------------------------|-------------|-------|-------|
| Employment, number of jobs | 734         | 551   | 918   |
| Output (\$ Millions)       | \$146       | \$110 | \$183 |
| Value Added (\$ Millions)  | \$96        | \$72  | \$119 |
| Taxes (\$ Millions)        | \$12        | \$9   | \$15  |
| State/Local                | \$6         | \$4   | \$7   |
| Federal                    | \$7         | \$5   | \$8   |

**Table 7: Long-Term Employment, Output and Value-Added Impacts of Operation Expenditures (Annually Recurring) From the Intermodal Facility Itself**

*Note: Please see Table 4 for a detailed definition of Direct, Indirect and Induced Output and Value Added activities. After construction of the terminal, "Output" of operations refers to revenues generated directly, indirectly and induced because of the intermodal terminal's existence in Winter Haven and "Value Added" refers to compensation paid to workers directly, indirectly and induced associated with the terminal as well as the business owner income (after expenses) of all businesses directly indirectly or induced as a result of the terminal.*

| Impact Category            | Direct | Indirect | Induced | Total |
|----------------------------|--------|----------|---------|-------|
| <b>Most Likely</b>         |        |          |         |       |
| Employment, number of jobs | 184    | 134      | 416     | 734   |
| Output (\$ Millions)       | \$92   | \$18     | \$36    | \$146 |
| Value Added (\$ Millions)  | \$63   | \$10     | \$23    | \$96  |
| <b>Low</b>                 |        |          |         |       |
| Employment, number of jobs | 138    | 101      | 312     | 551   |
| Output (\$ Millions)       | \$69   | \$14     | \$27    | \$110 |
| Value Added (\$ Millions)  | \$47   | \$7      | \$17    | \$72  |
| <b>High</b>                |        |          |         |       |
| Employment, number of jobs | 230    | 168      | 519     | 918   |
| Output (\$ Millions)       | \$115  | \$23     | \$45    | \$183 |
| Value Added (\$ Millions)  | \$79   | \$12     | \$28    | \$119 |

Finally, using the facility acreage-job creation relationship described in Section 3.1, the impacts from the *entire* integrated logistics center in Polk County were estimated over a 10-year period. Under the most likely scenario, the total economic impact is estimated at \$10.6 billion. The most

affected sectors are Rail and Truck Transportation (\$6.7 billion), Manufacturing (\$1.8 billion) and Services (\$1.4 billion).<sup>12</sup> The ILC is also expected to generate 8,500 jobs (by year 10) and \$0.9 billion in tax revenue, including \$0.4 billion at the state/local level. It is projected that the total development within the ILC will be: 3.0 million square feet of warehouse, 1.5 million square feet of industrial sites/plants, and 0.5 million square feet of office space. The job creation was calculated by considering employment densities (i.e., number of employees per square foot of development) for different land uses (industrial, commercial, office, warehousing, public facilities). Table 8 below shows the long-term economic impacts by impact category (output, value added and tax revenue) and scenario. Note that all figures are expressed in billions of 2005 dollars.

**Table 8: Long-Term Economic Impacts of the Integrated Logistics Center (Total after 10 Years)**

*Please note: The employment projection below is an estimate of the annual number of full-time jobs that will be generated after 10 years of operation (employment will ramp up over the 10 year period as the ILC is built out.) The economic projections below are the total cumulative benefits that will accrue over the entire 10 year period. "Output" refers to all revenues generated for services and materials provided at the ILC; "Value Added" refers to the compensation paid to employees associated with the ILC and business owner income (after expenses) for all business associated with the ILC.*

| <b>Impact Category</b>    | <b>Most Likely</b> | <b>Low</b> | <b>High</b> |
|---------------------------|--------------------|------------|-------------|
| Employment (jobs)         | 8,500              | 6,500      | 11,000      |
| Output (\$ Billions)      | \$10.6             | \$8.1      | \$13.6      |
| Value Added (\$ Billions) | \$6.9              | \$5.3      | \$8.9       |
| Taxes (\$ Billions)       | \$0.9              | \$0.7      | \$1.2       |
| State/Local               | \$0.4              | \$0.3      | \$0.5       |
| Federal                   | \$0.5              | \$0.4      | \$0.6       |

<sup>12</sup> The output (and value added) impacts were estimated with the output (and value added) per employee ratio derived from Table .

Table 9 below breaks down the long-term job creation in detail - at the intermodal facility, inside the ILC and outside the ILC in Winter Haven and Polk County.

**Table 9: Annual Polk County Employment Impacts After 10 Years  
(Number of Full-Time Jobs Created)**

| <b>Employment At The Park</b>  |              |
|--|--------------|
| <i>(For clarity, numbers have been rounded)</i>  |              |
| Number of persons employed at the intermodal facility  | <b>200</b>   |
| Number of persons employed elsewhere in the park; in:  | <b>1,800</b> |
| Warehouses   | 1,100        |
| Industrial plants/sites  | 500          |
| Offices  | 200          |
| <b>Total Employment At The Park</b>  | <b>2,000</b> |
| <b>Employment Outside The Park</b>   |              |
| Number of persons working indirectly for the park (including suppliers of goods and services to businesses located in the park)                          | <b>1,600</b> |
| Manufacturing  | 780          |
| Transportation, Communications, & Public Utilities   | 410          |
| Personal and Business Services   | 150          |
| Wholesale and Retail Trade   | 130          |
| Finance, Insurance, & Real Estate  | 100          |
| Others (industrial buildings, agriculture, etc.)   | 30           |
| Number of employees whose work depends on income generated directly or indirectly at the park (employees of local convenience stores, restaurants, etc.) | <b>4,900</b> |
| Personal and Business Services   | 2,400        |
| Manufacturing  | 1,850        |
| Finance, Insurance, & Real Estate  | 220          |
| Wholesale and Retail Trade   | 200          |
| Transportation, Communications, & Public Utilities   | 150          |
| Others (industrial buildings, agriculture, etc.)   | 80           |
| <b>Total Employment Outside The Park</b>   | <b>6,500</b> |
| <b>Grand Total Employment Impact in Polk County</b>  | <b>8,500</b> |

Table 10 below details the estimated annual salaries of the 8,500 full-time jobs that will be created throughout Polk County by the development of an ILC in Winter Haven. Note that all salaries are expressed in 2005 dollars. The total annual payroll of the 8,500 jobs created by the ILC (including benefits) would be \$282.2 million.

**Table 10: ILC Employment Breakdown with Salary Information**

| <b>Employment At The Park</b>  | <b>Jobs</b>  | <b>Average Employee Compensation (*)</b> |
|--|--------------|--|
| Number of persons employed at the intermodal facility  | 200          | \$62,500                                 |
| Number of persons employed elsewhere in the park; in:  | 1,800        | \$40,800                                 |
| Warehouses   | 1,100        | \$36,800                                 |
| Industrial plants/sites  | 500          | \$44,000                                 |
| Offices (administrative services)  | 200          | \$54,900                                 |
| <b>Total Employment At The Park</b>  | <b>2,000</b> | <b>\$43,000</b>                          |
| <b>Employment Outside The Park</b>   |              |  |
| Number of persons working indirectly for the park (including suppliers of goods and services to businesses located in the park)                          | 1,600        | \$38,600                                 |
| Manufacturing  | 780          | \$43,700                                 |
| Transportation, Communications, & Public Utilities   | 410          | \$42,000                                 |
| Personal and Business Services   | 150          | \$25,400                                 |
| Wholesale and Retail Trade   | 130          | \$25,700                                 |
| Finance, Insurance, & Real Estate  | 100          | \$22,100                                 |
| Others (industrial buildings, agriculture, etc.)   | 30           | \$33,700                                 |
| Number of employees whose work depends on income generated directly or indirectly at the park (employees of local convenience stores, restaurants, etc.) | 4,900        | \$27,500                                 |
| Personal and Business Services   | 2,400        | \$25,500                                 |
| Manufacturing  | 1,850        | \$29,400                                 |
| Finance, Insurance, & Real Estate  | 220          | \$21,200                                 |
| Wholesale and Retail Trade   | 200          | \$27,900                                 |
| Transportation, Communications, & Public Utilities   | 150          | \$38,800                                 |
| Others (industrial buildings, agriculture, etc.)   | 80           | \$32,200                                 |
| <b>Total Employment Outside The Park</b>   | <b>6,500</b> | <b>\$30,200</b>                          |
| <b>Grand Total Employment Impact in Polk County</b>  | <b>8,500</b> | <b>\$33,200</b>                          |

(\*) Employee compensation represents total payroll costs, including: the wages and salaries of workers who are paid by employers, as well as benefits such as health and life insurance, retirement payments, and non-cash compensation. **In today's dollars (not adjusted for inflation after 2005).**

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## 4. THE ROLE OF INTEGRATED LOGISTICS CENTERS IN THE COMMUNITY

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This chapter addresses how the design and operations of intermodal facilities and ILCs have become a critical and positive factor in the regional economy and social fabrics of communities where they are located.

### 4.1 Good Neighbor Policy

As communities have become aware of the new intermodal facility concept, its role in the economic growth and freight movement facilitation, and its impact on employment locally, transportation organizations too have become more mindful of the need to integrate these facilities with community goals. During the past years, many transportation organizations addressed community concerns and needs, first becoming a “*good neighbor*” and then implementing design and operational practices to meet community needs.

A 2003 report by the National Cooperative Highway Research Program (NCHRP)<sup>13</sup> identified CSX together with FedEx, Port of Oakland (California) and Petro Stopping Centers as companies that have successfully implemented policies to strengthen their role of a good neighbor. Such practices, as defined by the Center for Corporate Citizenship at Boston College, consists of seven standards of excellence:



*Banners adorned local streets during CSX's 59th Street terminal Grand Opening in 1998.*

- 1) **Leadership** – Senior executives demonstrate support, commitment, and participation in community involvement efforts.
- 2) **Issues Management** – The company identifies and monitors issues important to its operations and management.
- 3) **Relationship Building** – Company management recognizes that building and maintaining relationships of trust with the community is a critical component of company strategy and operations.
- 4) **Strategy** – The company develops and implements a strategic plan for community programs and responses that is based on the mutual issues, goals and concerns of the company and the community.
- 5) **Accountability** – All levels of the organization have specific roles and responsibilities for meeting community involvement objectives.

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<sup>13</sup> National Cooperative Highway Research Program, *Integrating Freight Facilities and Operations with Community Goals, A Synthesis of Highway Practice*, NCHRP Synthesis 320, National Academy of Sciences, 2003.

- 6) **Infrastructure** – The company incorporates systems and policies to support, communicate and institutionalize community involvement objectives.
- 7) **Measurement** – The company establishes an ongoing process for evaluating community involvement strategies, activities and programs and their impact on the community.

## 4.2 Strategies for Meeting Community Goals and Needs

Integrating intermodal facility objectives with community goals, while often detailed, proved to make these facilities highly successful within their communities. The NCHRP report assessed the following examples to determine the characteristics of successful practices:

- The FAST Corridor in Washington State;
- The M&E Railway and Toys ‘R’ Us Distribution Center in New Jersey;
- The Louisville Quiet Zone in Kentucky;
- The Alameda Corridor in California;
- The Guild’s Lake Industrial Sanctuary in Portland, Oregon;
- The Port of New York and New Jersey Green Ports Initiative; and
- The CSX Intermodal Terminal in Syracuse, New York.

While there are several strategies based on the issue in hand (See Appendix C), the following are the types of concerns that are addressed by a successful public private partnership in developing intermodal or ILC facilities:

- 1) *Traffic flow and congestion* – It is critical that adequate highway road infrastructure exist or be provided for to ensure the smooth flow of truck traffic to and from an ILC facility. Where traffic flows or traffic roadways need to be enhanced, public agencies are typically looked to provide leadership and financial support.
- 2) *Safety and security* – Undertaking public education programs such as Operation Lifesaver, creating highway watch programs to leverage the presence of trucks into an added security net for all motorists, and strengthening cargo inspections.
- 3) *Economic development* – Combining economic and transportation system development, retaining existing industrial areas, redeveloping “brownfields” and hiring locally for freight transportation project construction and ongoing operations.
- 4) *Air quality* – Implementing Green Ports practices where practical such as electrifying gantry cranes and using alternatively fueled equipment; reducing the need to idle trucks and locomotives; and promoting beneficial reuse of dredged materials.
- 5) *Noise and land use* – Installing sound walls, creating whistle-free quiet zones, creating buffer zones to provide separation between freight/industrial uses and residential uses, and ensuring the necessary highway access improvements for trucks.

Table 11 below provides the issues identified for the seven case studies.

**Table 11: Selected Projects by Issue Area and Freight Type**

| Profile Project   | Issue Areas  |                   |                      |                         |                   |                  |                | Freight Types |          |           |       |
|---|--------------|-------------------|----------------------|-------------------------|-------------------|------------------|----------------|---------------|----------|-----------|-------|
|   | Traffic Flow | Safety & Security | Economic Development | Air Quality/Environment | Noise/ Vibrations | Land Use & Value | Communications | Rail          | Trucking | Air Cargo | Water |
| FAST Corridor   | X            | X                 | X                    | X                       |                   |                  | X              | X             | X        |           | X     |
| Morristown and Erie Railway and Toys 'R' Us Distribution Center | X            | X                 | X                    |                         | X                 | X                | X              | X             |          |           |       |
| Louisville Quiet Zone   |              | X                 |                      |                         | X                 |                  | X              | X             |          |           |       |
| Alameda Corridor  | X            | X                 | X                    | X                       | X                 | X                | X              | X             | X        |           | X     |
| Guild's Lake Industrial Sanctuary                               | X            |                   | X                    |                         | X                 | X                | X              | X             | X        |           | X     |
| Port of NY/NJ Green Ports Initiative                            |              |                   |                      | X                       | X                 |                  | X              |               |          |           | X     |
| CSX Syracuse Intermodal Terminal                                | X            | X                 | X                    |                         | X                 | X                | X              | X             | X        |           |       |

*Source: National Cooperative Highway Research Program, Integrating Freight Facilities and Operations with Community Goals, A Synthesis of Highway Practice, NCHRP Synthesis 320, National Academy of Sciences, 2003.*

As a conclusion, the NCHRP report found that the key to successful integration of intermodal facilities objectives and community goals can be summarized in three main points:

- **Ongoing Productive Communication** – There was common understanding of the issues which facilitated the parties to work together to craft the solutions, and continuously checking to see if the solutions remained effective.
- **Full Awareness of the Role** – The implementing organizations gave meaningful thought as to what constituted being a good neighbor.
- **Real and Credible Strategies to Meet Community Concerns** – The practices are pragmatic, real-world solutions to real-world problems. Some of the solutions are commonsense – make sure roadway access is adequate. Others involve more technological applications, such as new equipment that eliminates the need to idle locomotives and trucks, as well as new fixtures that reduce light spillage.

## APPENDIX A: MATRIX OF BENEFITS

| BENEFIT CATEGORY            | BENEFIT/IMPACT METRIC                                    | DESCRIPTION  | UNIT  | MONETIZABLE (Yes/No) | DATA AVAILABILITY <sup>1</sup> |
|-----------------------------|--|--|---|----------------------|--------------------------------|
| <b>Production Process</b>   | Freight volume   | Increase in the volume of freight carried  | Tons, ton-miles, dollars                      | Yes                  | ***                            |
|                             | Logistics cost   | Decrease in logistics cost   | Dollars per ton                               | Yes                  | ***                            |
|                             | Transportation cost                                      | Decrease in transportation cost (e.g., drayage cost may be entirely eliminated)  | Dollars per ton-mile                          |                      |                                |
|                             | Transportation network                                   | Economies of scale associated with transportation network expansion  | Tons, dollars                                 | Yes                  | ***                            |
|                             | Synergy and market access                                | Better access to input and output markets  | Distance in miles to input and output markets | No                   | ***                            |
| <b>Economic Value</b>       | Business output  | Gross output, measured by the total value of purchases by intermediate and final consumers   | Dollars                                       | Yes                  | ***                            |
|                             | Value added  | Net output, i.e. employee compensation and property income (interest, rent and profits)  | Dollars                                       | Yes                  | *                              |
|                             | Employment   | Number of full-time and part-time jobs by industry (warehousing, transportation, distribution, manufacturing, etc.)  | #   | Yes                  | ***                            |
|                             | Labor income   | Salaries and wages earned  | Dollars                                       | Yes                  | ***                            |
|                             | Tax revenue  | Tax revenue (property tax, income tax, etc.) at the local, state and federal levels  | Dollars                                       | Yes                  | ***                            |
| <b>Economic Development</b> | Redevelopment  | Redevelopment of underutilized land (e.g., old military facilities)  | Acre  | Yes                  | **                             |
|                             | New businesses   | Ability to retain existing businesses and attract new businesses to the area   | Number of companies                           | Yes                  | **                             |
|                             | Number of residential properties                         | Change in the number of residential properties   | #   | Yes                  | *                              |
|                             | Residential property value                               | Change in the value of residential properties  | Dollars                                       | Yes                  | *                              |
| <b>Congestion Relief</b>    | Traffic  | Reduction in truck traffic on highways   | Trucks as a percentage of AADT                | No                   | **                             |
|                             | Travel time  | Reduction in delays experienced by all users of the highway network  | Person-hours of delay, ton-hours of delay     | Yes                  | **                             |
|                             | Travel time reliability                                  | Increase in travel time reliability  | % of container deliveries on time             | No                   | *                              |
|                             | Vehicle operating cost                                   | Reduction in out-of-pocket expenses associated with owning, operating, and maintaining a vehicle (fuel consumption, oil consumption, maintenance and repairs, etc.)                                  | Cost per mile                                 | Yes                  | **                             |
| <b>Environment</b>          | Fuel consumption (or energy intensity)                   | Reduction in fuel (or energy) consumption as a result of a shift from truck to rail or technology advances reducing truck processing time at intermodal facilities                                   | Ton-miles per gallon, Btu per ton-mile        | Yes                  | **                             |
|                             | Air quality  | Reduction in emissions of pollutants (nitrogen oxides, volatile organic components, sulphur oxides, particulate matter of 10 microns or less, carbon monoxide) and greenhouse gases (carbon dioxide) | Tons  | Yes                  | **                             |
|                             | Noise and vibrations                                     | Reduction in vibrations and noise level. The length and the timing of exposure should also be considered.  | Decibels                                      | Yes                  | *                              |
| <b>Safety</b>               | Property damage only accidents                           | Reduction in the number and cost of property damage only accidents   | Accidents per ton-mile, accident cost         | Yes                  | **                             |
|                             | Injury accidents   | Reduction in the number and cost of injury accidents   | Accidents per ton-mile, accident cost         | Yes                  | **                             |
|                             | Fatal accidents  | Reduction in the number and cost of fatal accidents  | Accidents per ton-mile, accident cost         | Yes                  | **                             |
| <b>Security</b>             | Criminal acts  | Reduction in criminal acts (e.g., thefts)  | #, dollars                                    | Yes                  | *                              |
|                             | Smuggling of illegal/controlled substances and materials | Interception of illegal/controlled substances and materials  | Tons or dollars                               | Yes                  | *                              |
| <b>Hurricane Relief</b>     | Evacuation of population                                 | Number of people evacuated   | Number of people evacuated                    | No                   | *                              |
|                             | Recovery and aid   | Medical supplies, food, tents and other supplies and equipment transported   | Tons, dollars                                 | Yes                  | *                              |

<sup>(1)</sup> Scoring indicates the extent to which the data is available (based on Task 1 Literature Review). The more stars the easier it is to access the data.

## APPENDIX B: PRACTICES IMPLEMENTED TO MEET COMMUNITY CONCERNS

| Practice  | Issue Areas  |                   |                      |                         |                  |                  |                | Freight Types |          |           |       |
|---|--------------|-------------------|----------------------|-------------------------|------------------|------------------|----------------|---------------|----------|-----------|-------|
|   | Traffic Flow | Safety & Security | Economic Development | Air Quality/Environment | Noise/Vibrations | Land Use & Value | Communications | Rail          | Trucking | Air Cargo | Water |
| Replace at grade rail crossings with grade separated crossings              | X            | X                 |                      | X                       | X                |                  |                | X             | X        |           |       |
| Replace at-grade rail line with below grade rail line                       | X            | X                 | X                    |                         | X                | X                |                | X             |          |           |       |
| Modify rail hours of operation to minimize conflicts                        | X            |                   |                      |                         | X                | X                |                | X             |          |           |       |
| Develop truck-only access routes  | X            | X                 | X                    | X                       | X                | X                |                | X             | X        | X         | X     |
| Require developers to make necessary highway access improvements for trucks | X            | X                 | X                    |                         |                  | X                |                |               | X        |           |       |
| Participate in interstate corridor analyses                                 | X            |                   | X                    |                         |                  |                  |                | X             | X        |           |       |
| Motivate mode shift - truck to rail   | X            |                   |                      | X                       |                  |                  |                | X             | X        |           | X     |
| Undertake integrated freight/economic development program                   | X            | X                 | X                    |                         |                  | X                | X              | X             | X        | X         | X     |
| Close at-grade rail crossing  | X            | X                 |                      | X                       | X                |                  |                | X             | X        |           |       |
| Designate routes for heavy weight trucks                                    | X            | X                 |                      |                         | X                |                  |                |               | X        |           |       |
| Ban or limit trucks on routes   | X            | X                 |                      |                         | X                | X                |                |               | X        |           |       |
| Build more truck rest areas and parking                                     | X            | X                 |                      |                         |                  |                  |                |               | X        |           |       |
| Undertake spot improvements to transportation infrastructure                | X            | X                 |                      |                         |                  |                  |                |               | X        | X         | X     |
| Create incident management program or truck safety hotline                  | X            | X                 |                      |                         |                  |                  | X              | X             | X        |           |       |
| Use intelligent transportation system technologies                          | X            | X                 |                      | X                       |                  |                  |                | X             | X        | X         | X     |
| Develop rail spur   | X            |                   | X                    | X                       |                  |                  |                | X             |          |           |       |
| Relocate rail yard  | X            |                   | X                    |                         |                  | X                |                | X             |          |           | X     |
| Encourage reuse of brownfields  | X            |                   | X                    | X                       |                  | X                |                | X             | X        |           | X     |
| Retain existing industrial areas  | X            |                   | X                    | X                       |                  | X                |                | X             | X        | X         | X     |
| Require staging areas for trucks at buildings                               | X            |                   |                      | X                       |                  |                  |                |               | X        |           |       |
| Schedule truck appointments   | X            |                   |                      | X                       |                  |                  |                | X             | X        | X         | X     |
| Reduce number of empty truck movements                                      | X            |                   |                      | X                       |                  |                  |                |               | X        |           | X     |
| Undertake public education  |              | X                 |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Hire locally  |              |                   | X                    |                         |                  |                  | X              | X             | X        | X         | X     |
| Install upgraded rail crossing gates/barriers                               |              | X                 |                      |                         |                  |                  |                | X             | X        |           |       |
| Create wall/pedestrian path to reduce trespassing                           |              | X                 |                      |                         |                  |                  |                | X             |          |           |       |
| Create truck-based Highway Watch Program                                    |              | X                 |                      |                         |                  |                  | X              |               | X        |           |       |
| Strengthen cargo inspection   |              | X                 |                      |                         |                  |                  |                | X             | X        | X         | X     |
| Develop driver training programs  |              | X                 |                      | X                       |                  |                  |                |               | X        |           |       |
| Promote beneficial reuse of dredged materials                               |              |                   | X                    | X                       |                  |                  |                |               |          |           | X     |
| Purchase abandoned rail line and/or facility                                |              |                   | X                    |                         |                  |                  |                | X             |          |           |       |
| Create neighborhood investment fund   |              |                   | X                    |                         |                  | X                |                | X             |          | X         | X     |
| Undertake public charettes  |              |                   |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Create public outreach video  |              |                   |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Create "no whistle" rail zone   |              |                   |                      |                         | X                |                  |                | X             |          |           |       |
| Attend public meetings  |              |                   |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Continuously engage the public and elected officials                        |              |                   |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Build sound walls/berms   |              |                   |                      |                         | X                | X                |                | X             | X        | X         | X     |
| Include buffer zones  |              |                   |                      |                         | X                | X                |                | X             | X        | X         | X     |
| Use specialized fixtures to reduce light spillage                           |              |                   |                      | X                       |                  |                  |                | X             | X        | X         | X     |
| Limit truck/loading dock hours of operation in neighborhood                 |              |                   |                      | X                       | X                | X                |                |               | X        |           |       |
| Use lower-emission locomotives/reduce locomotive idling                     |              |                   |                      | X                       |                  |                  |                | X             |          |           |       |
| Facilitate meetings between community and freight providers                 |              |                   |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Install hush kits on aircraft   |              |                   |                      | X                       | X                |                  |                |               | X        |           |       |
| Encourage/use alternatively fueled vehicles                                 |              |                   |                      | X                       |                  |                  |                |               | X        | X         | X     |
| Install electric gantry cranes and other "Green Port" technologies          |              |                   |                      | X                       |                  |                  |                |               |          |           | X     |
| Create uniform national program for ballast water discharge from vessels    |              |                   |                      | X                       |                  |                  |                |               |          |           | X     |
| Develop cleaner fuels   |              |                   |                      | X                       |                  |                  |                | X             | X        | X         | X     |
| Use equipment to reduce need to run truck engines at truck stops            |              |                   |                      | X                       |                  |                  |                |               | X        |           |       |
| Create 800 number and website for community inquiries                       |              |                   |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Establish advisory committees   |              |                   |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Create channels for information provision to the public                     |              |                   |                      |                         |                  |                  | X              | X             | X        | X         | X     |
| Undertake sound-proofing program  |              |                   |                      |                         | X                |                  |                |               |          | X         |       |
| Retire older cargo aircraft   |              |                   |                      | X                       | X                |                  |                |               |          | X         |       |
| Install continuous welded rail  |              |                   |                      |                         | X                |                  |                | X             |          |           |       |

Source: National Cooperative Highway Research Program, *Integrating Freight Facilities and Operations with Community Goals. A Synthesis of Highway Practice*, NCHRP Synthesis 320, National Academy of Sciences, 2003.

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