

## 5.0 INTERMODAL LOGISTICS OPPORTUNITIES

In addition to identifying markets and sectors of current and future advantage in Oklahoma, this chapter also describes logistics hub potential from the standpoint of modes of transportation, including air cargo hub opportunities, intermodal rail freight hub opportunities, and intermodal developments associated with Oklahoma's inland waterway system.

### 5.1 Air Cargo

Potential air cargo hub opportunities have been identified from an examination of market trends, air cargo express operations, and particular advantages that Oklahoma may provide for air cargo.

#### 5.1.1 Air Cargo Market Trends

**Forecasts:** According to the FAA and large aircraft manufacturers' forecasts, the air cargo market is expected to grow at approximately six percent annually for the next twenty years. The trend toward the combined use of air and truck package delivery is expected to continue with major emphasis on deferred second-day delivery segments of the market. These trends emphasize the importance of the processing hubs being located within 400 to 500 miles from major population centers.

**Internet Based Business:** As late as 1995, sales through the Internet were essentially zero. By 1999, U.S. Internet based business-to-business and consumer sales had grown to nearly \$7 billion and 166 million packages were shipped by internet retailers, with approximately 70% going by express air freight. In 2003 approximately 1.2 billion packages were shipped by "e-tailers" with overall global e-commerce approaching \$7 trillion. Because the Web cannot move a box, e-commerce distribution centers are located at and near airports that have extensive flight networks. Airport-located facilities to serve e-commerce can include:

- Special transfer facilities or warehouses to serve just-in-time supply chain products (such as refrigerated warehouses for perishable flowers) that facilitate transfers between aircraft and trucks
- Emergency parts provision centers
- Reverse logistics facilities for repair and upgrade of high tech products such as computers and cell phones

**Aircraft Technology:** The growth in the air cargo transportation sector is largely due to the ability of new engines for large air cargo aircraft (Boeing-747, A-380 Airbus) to have non-stop ranges of over 7,000 miles. This aircraft flying range puts Oklahoma within non-stop flying distances to any place in the world. Long-range aircraft technology combined with the growth in global trade allows air cargo operators as well as the major international and domestic manufactures of goods to by-pass the traditional east coast (New York and Miami) and west coast (Los Angeles and Seattle) international air cargo distribution centers and fly direct to regional end-user destinations, such as the Oklahoma/Texas markets.

**Air Cargo Facilities:** Other major trends that will benefit Oklahoma are that both the major east coast and west coast air cargo airports are operating at capacity and have no available land for

expansion of additional air cargo processing facilities. The only air cargo facility development at these major coastal airports is the normal redevelopment of existing facilities.

**Air Cargo Security:** The new Transportation Security Agency (TSA) is in the process of developing guidelines for the 100 percent inspection of all goods that are shipped by air cargo aircraft. The implementation of this mandate will cause delays in the movement of goods and the expansion of processing facilities and freight truck staging areas. These air cargo delay issues may result in the air cargo operators shifting their east coast and west coast operations to in-land airports that have the land to accommodate both the air cargo processing facilities as well as the highway infrastructure that is required to maintain the next-day and second-day delivery schedules that have become the normal customer demand of the air cargo industry.

**Environmental Issues:** The typical air cargo operating requirement of picking up packages in the evening and flying the packages at night has resulted in severe noise impacts to the populations that live within ten miles of an air cargo airport. With the doubling of the air cargo market every decade, it is anticipated that the existing air cargo hub operations will be restricted and that new international and regional hubs will have to be established. States such as Oklahoma that have vast areas of undeveloped flat land and mild weather are positioned to attract future international and regional air cargo hub facilities.

### **5.1.2 Next Day/Second Day Cargo Operators**

The express-air freight market is currently dominated by five major carriers. With their roots in next day/second day domestic package deliveries, these carriers took advantage of their multi-modal system needs, available space, lower costs, and acceptable weather to locate their hubs in the Ohio River valley. The five major carriers and their principal hubs are:

- Federal Express – Major hub in Memphis
- United Parcel Service – Major hub in Louisville
- DHL – Major hub in Wilmington/Cincinnati
- Emery/Menlo – Major hub in Dayton
- BAX – Major hub in Toledo

Of these five operators, FedEx and UPS control over 75 percent of the next-day and second-day air freight market. DHL has recently started to expand its operations and is expected to increase its market share. Emery and BAX both concentrate on specific segments of the market. Over the next 20-years, it is expected that certain operators will consolidate their operations and that additional international-domestic express air freight operators will enter the market.

The primary hub locations of the five major operators are all located within a one-day drive of over ten million people. In addition, having the principal hubs located on the western edge of the Eastern Time zone gives the operators an additional hour of package pick-up time for package delivery to the western time zones at the least possible air distance. These hubs, however, do not serve only truck-to-air or air-to-truck functions; much of the growth of these businesses requires truck-to-truck transfers at these hubs. Both FedEx and UPS have an established system of regional hubs; the FedEx southwest regional hub is located at Fort Worth Alliance Airport. Only DHL appears to be still looking for sites for additional regional hub locations.

To expand their markets as well as meet aggressive business plans, the major operators such as FedEx and UPS are moving beyond multi-modal transfers to contract with major mail-order suppliers, such as Lands End, to locate the product warehousing, customer shipping, internet computer center, and product return operations at the hub facilities. This trend for next-day and second-day service to international markets is expected to be expanded to also include the manufacturing of the products at the air cargo hub location.

### **5.1.3 Advantages and Opportunities for Oklahoma**

#### **Positive Aspects for Oklahoma**

- Low labor and other business costs
- Central mid-continent location
- Mild weather
- North-south and east-west Interstate Highway network
- Close to Dallas-Fort Worth industrial and population base
- Major Defense Department Logistics Center location
- Land available in many locations for the development of a new air cargo/industrial park airport (6,000-10,000 acres) that could accommodate large aircraft noise footprints
- Land available for air cargo facilities at Oklahoma City/Will Rogers World Airport
- Within non-stop air cargo aircraft range of the major cities of Asia, Europe, and South America
- Center of aircraft systems manufacturing industry and oil field support industry
- One-day drive time to major Midwestern, Southeastern, Southwestern and Plains states' population centers
- Close proximity to Mexico and the trade benefits of NAFTA

#### **Potential Oklahoma Air Cargo Hub Initiatives - Short Term (see Table 5.1)**

- Explore feasibility of encouraging the TSA to team with a major express freight operator (i.e., DHL) to establish a prototype air cargo security test facility at Tulsa International Airport or Oklahoma City/Will Rogers World Airport.
- Initiate studies to determine the feasibility of establishing a site for a major industrial park that would include an air cargo airport with parallel runways and could focus on high value oil field support manufacturing equipment and the manufacturing of aerospace equipment.
- Conduct a feasibility study to identify market potential for development or expansion of regional air cargo hubs, including potential for expansion and development of the Ardmore Airpark as a regional air cargo facility having the potential to effectively serve north Texas markets, as well as the potential for significant development/enhancement of intermodal hubs at Oklahoma City/Will Rogers World and Tulsa International airports, or other locations in the vicinity of these cities, such as the previously-considered Stroud location or Muskogee airport.
- Explore feasibility of establishing potential air transportation partnerships with Mexican (Aero Mexico) and Central American air cargo airlines to build upon existing commercial links in delivering perishable fresh flowers by establishing a larger fresh flower distribution center within the Free Trade Zones at either Tulsa International or Will Rogers World airports. The NAFTA ground transportation agreements would help to enhance air trade ties with Mexico and Central America.

- Explore the potential of encouraging the US Department of Defense (USDOD) to establish a central US Air Transportation Logistics Center in Oklahoma for worldwide transport of multiple forms of material and personnel. USDOD charter flights to the Mid-East, Europe and Asia could operate from the existing runway systems at the Tulsa and Oklahoma City airports.

**Potential Oklahoma Air Cargo Hub Initiatives – Long Term ( see Table 5.1)**

- Seek partnerships to attract Asian and European high value product manufactures (auto, computer, cell phone, pharmaceutical, textiles, etc.) to establish manufacturing and air/ground distribution centers at an existing or new air cargo airport site in Oklahoma.
- Initiate studies to determine the potential of attracting international air cargo airlines (Japan Airlines, Cathy Pacific, ANA Airlines, British Air, Singapore Airlines, Lufthansa Airlines, Emirates Airlines, Korean Airlines EVA Airlines, etc.) to establish an International Air Cargo Hub in Oklahoma that would provide a “by-pass” (to the congested east coast and west coast air cargo international gateways) air cargo distribution point.

**Table 5.1 Potential Air Cargo – Specific Opportunities**

<b>Opportunity</b>	<b>Location</b>	<b>Market/commodity</b>	<b>Mode</b>	<b>Activities</b>	<b>Major Advantages/ Obstacle(s)/Other implementation related comments</b>
Major Air Cargo Facility to serve foreign and domestic deliveries	New rural international airport with 6,000 acres; De-commissioned military airport	High value product manufacturing market base (auto, computer, cell phone, aircraft systems, etc.) that currently use East and West Coast gateway airports	Air/ Truck/ Rail	Market study; Partnership with Asian or US firm	Available land; low labor cost; mild climate; roadway network
DHL Regional Hub	OKC or Tulsa	Express Freight next day and second day service	Air/ Truck	Market study; Partnership with DHL	Regional hub not likely; Uncertain of DHL business model
Regional Air Cargo Facility serving existing/potential new high tech manf. centers – single firm model (Apple, Dell); multi firm model (industrial park or FTZ) and markets within a two day trucking radius	Close to OKC and/or Tulsa airports, Stroud, Muskogee, Ardmore, Burns Flat	Serve on- or near-site high tech manufacturing and markets for high value added goods within a two day trucking radius	Air/ Truck	Market study	Major competition from DFW and Alliance Airport. Areas with good highway access would be most favorable. OKC airport has substantial available land, capacity; Ardmore Airpark already established, and proximate to warehousing and distribution centers
TSA Prototype International Air Cargo Processing Center	OKC or Tulsa airports	Option to constrained east coast and west coast gateway airports	Air/ Truck	Market study; partnership with TSA	Existing international air cargo gateway airport facilities are constrained
Mexico & Central America NAFTA/ Foreign Trade Zone site for Perishable Goods Distribution Center	OKC and/or Tulsa airports	Perishable goods (flowers) same day distribution to Mid-America Region	Air/ Truck	Market Study; partnership with Mexican or Central American flower producer	Close to Dallas and several other large metropolitan areas within 500 miles; low labor costs; roadway network

## 5.2 Rail Freight

Oklahoma's ability to attract one or more major rail/truck intermodal lift facilities is considered limited. An intermodal facility is one where containers or truck trailers are carried via rail to a facility where they are lifted off of the rail flatcar and then sent off by way of a truck carrying that trailer (or a truck trailer specially created to carry the container) to the shipments' final destination.

Oklahoma City sits in the "middle" of a triangle between Denver, Kansas City and Dallas. Those three locales already have major rail intermodal facilities, each operated by BNSF. Monthly lifts, not including UP facilities in these locations, are as follows:

- Dallas/Fort Worth at Alliance 45,000 per month
- Kansas City Argentine Yard 25,000 per month
- Denver 10,000 per month

(There are two small BNSF intermodal facility operations in the region: Oklahoma City (1200 lifts per month; no containers, only trailers on flat cars), and Amarillo (670 lifts per month).

Contributing to the unlikelihood of a major intermodal rail facility in Oklahoma are the distances between the three cities mentioned above:

- Denver to Kansas City – 605 miles
- Kansas City to Dallas – 552 miles
- Denver to Dallas – 780 miles

Thus, most parts of Oklahoma are already well served by truck to major intermodal rail facilities within a day's drive.

In addition, 75 percent of all rail traffic in Oklahoma is "through" traffic; i.e., it has neither an origin nor a destination within the state. This means that there may not be sufficient concentration of demand for intermodal to be efficiently served on a major scale in Oklahoma.

The Class I Railroads' preference is to move long 50 to 110 car unit trains long distances without intermediate stopping, carrying coal, grain, and aggregate products, as well as fast, high priority intermodal trains carrying containers or truck trailers. Travel distances and the nature of rail freight commodity moves in Oklahoma thus seem to dictate against the Class I Railroads' preferences for intermodal service.

While major intermodal rail facilities are not likely to be of interest to any of the Class I Railroads in Oklahoma, the potential for "transload" facilities does exist, and should be explored with the railroads. Transloading is a concept through which a freight customer without rail access contracts with a third party to have his products (e.g., 100 large cardboard cartons of some product) taken to a railroad siding (i.e., the transload facility), loaded on the rail box car, and taken to a destination by rail for storage in a warehouse until it is sent by truck to its final destination.

There are two principal types of Transload facilities: bulk and dimensional. A transload facility for **bulk** commodities (perhaps fuels or liquid chemicals) transfers the bulk cargo from a pipeline or truck onto a train; it is then shipped across the country, and then loaded onto trucks or into large storage tanks or warehoused. **Dimensional** transload facilities serve lumber or oversized products/shipments. Transload facilities could also interface with the inland waterway system, for selected bulk (e.g., scrap steel) or dimensional (e.g., raw timber or lumber) commodities.

The BNSF maintains a large transload facility in the Fort Worth area, owned by Saddle Creek Corp. That facility has 860,000 square feet of storage area. There is a Saddle Creek Corp. facility in Oklahoma City, but of much smaller dimension (120,000 square feet of storage).

Oklahoma is a candidate for more of these types of facilities, including dimensional and bulk, based on the kinds of products and commodities produced or consumed in Oklahoma. For example, forestry products from the southeastern portion of Oklahoma could benefit from such a facility. Specific opportunities are shown in Table 5.2 below.

Table 5.2 Potential Rail Freight – Specific Opportunities

Possible Opportunity	Location	Market/commodity	Mode	Activity	Major Advantages/ Obstacle(s)/Other implementation related comments
Rail/Truck Intermodal facility serving OKC General Motors Plant	OKC	Auto assembly	Rail/Truck	Partnering: GM, BNSF, UPRR, ODOT, ODOC	Manufacturing plant is on BNSF; finished vehicles are now shipped by truck approximately 6-7 miles to rail load-out on UPRR.
Rail/Truck Intermodal facility serving auto assembly plant in rural areas	Rural OK	Auto assembly	Rail/Truck	Partnering with auto manufacturer	Better to establish in rural areas to avoid union labor issues
Transload or specialized handling of Forestry Products	SE Oklahoma	Raw timber; wood pulp; furniture	Special rail/cargo handler		Possible market for three shortline railroads in SE Oklahoma
Short Line RR Improvements/ Rehabs & Upgrades	Statewide	Existing RR customer base serving various markets	Short haul RR	Interline improvements for short haul RR to access Class 1 mainlines	Funding constrained; ODOT may consider financial support to upgrade track and bridge infrastructure of State-owned rail lines leased to short line railroads.
Locomotive maintenance facilities relocate to OK, e.g., from Denver					Railroads usually locate these facilities in higher traffic density locations
Expand rail capacity and connectivity in Southern OK	Southern OK, Ardmore	Crushed stone; aggregates	Rail	Enhance existing flow of Oklahoma aggregates to Texas markets	Would significantly reduce heavy truck traffic flows in Ardmore and other Southern OK areas
Public Sector (ODOC) Work with Developer & RR to Jointly Develop Intermodal Ramps (e.g., transload)	Statewide	All commodities eligible	Rail, truck, barge, pipeline		Pre-mature to identify locations at this time
Military Logistics		Air Force, Military-Information Technology; Selected Materials	Rail, Other	Movement/mobilization of materials; Perform market study to determine economics for OK & DOD	Oklahoma centrally located nationally
Agricultural Processing Production (value added food production)	Western OK	Processed grain, edible oils, canola oil, ethanol, livestock	Short Lines	Ship raw products in or finished products out	A growth market

### 5.3 Inland Waterway

Movement of cargoes by the waterway system tend to be limited to the least time sensitive, but transport cost sensitive, heavy bulk commodities. Many commodities now moved by truck were transported at one time or another on the waterway. However, due to scheduling reasons (unpredictability), many of those commodities shifted to trucks when fuel prices were lower and incremental cost increases for trucking were rather nominal. Given the increase in fuel prices, the transport cost balance may again be tipping to favor barge service for some commodities, and shifting of transport modes could follow if the waterway ports and barge service operators can develop a way to guarantee delivery schedules. ODOT is working with an Oklahoma–Arkansas industry consortium to address that problem.

While low valued bulk commodities will inevitably dominate the waterway system, container on barge (COB) service has emerged in parts of the Gulf of Mexico and within the Mississippi River system. As described below, the potential for this service may have increased with the emergence of an important COB operation from Houston to New Orleans.

The following commodity movements represent potential areas of growth for the inland waterway system. Support for these potential commodity movements may be facilitated by selected investments, including intermodal investments serving the two major public ports at Catoosa and at Muskogee, as well as improved access to the numerous private sector ports (e.g., Port 33) along the waterway system.

- Scrap steel is a significant business for the waterway system, but most of it goes across the state line to the Port of Ft. Smith, Arkansas, for loading onto barges, because of existing facilities there (operated by the Yaffee Company). Until now, the Oklahoma ports have not expressed a keen interest in the scrap business because it is viewed as quite messy and somewhat disruptive to their other businesses. Scrap steel goes to New Orleans to feed a mini-mill in LaPlace, Louisiana, owned by Bayou Steel. Specialized facilities to handle scrap steel may be considered to capture some of this market.
- Tulsa has a significant concrete pre-casting industry but most of the product is moved by truck to the Oklahoma interior. Apparently the waterway service is not convenient for the in-state use of these products. Only an out-of-state shipment of heavy or oversize items would likely go by water.
- Oklahoma coal was at one time a significant export moved by barges, reportedly 3 to 4 barges per day at its peak. Coal was destined for power plants located along the Mississippi and Ohio waterways. Due to a variety of causes, the coal industry in Oklahoma has declined, but there is some potential for this industry to re-emerge on a selected basis.
- Containers on barges (COB) are thought by some officials within the ODOT to be a potential area of significant growth. One such operator, Osprey Lines, has started successful Houston to New Orleans COB shuttle service that has been extended up the Mississippi River to Baton Rouge. Osprey is considering extending the service to Memphis, and perhaps beyond. ODOT has not identified any specific users or cargo for a potential COB service at this time. An increasingly popular logistics strategy of warehousing cargo in the “pipeline” fits well with COB service and overcomes its inherently slower delivery. A difficult issue needing further attention is reliability of COB service -- meaning certainty of on-time

delivery, despite occasional delays encountered on the inland waterway system. Waterway transportation companies are exploring ways to overcome this issue with ‘back-up’ delivery schemes. Pacific Northwest ports are moving relatively low value cargo such as scrap paper and hay via COB service.

With respect to the waterway system itself (apart from intermodal connections to the ports) there are a number of initiatives which could improve the marketing opportunities for the waterway. These include:

- Addressing problems of deteriorating waterway infrastructure.
- Increasing the available draft in the waterway to 11.5 feet, from 8.5 feet currently. This additional draft would allow significantly heavier loads in each barge that produce net cost savings. Most of the system already meets this depth, but several areas require dredging to eliminate ‘high spots’. Locks are adequate and will not require changes.
- Adding “tow haulage” equipment to the locks on the system in Oklahoma (tow haulage equipment has already been installed on all locks in Arkansas). This involves the installation of large winches and rigging to allow barge strings to be moved through locks without the tow boat. Benefits of such equipped locks would include reduced locking times and lower towing costs, as well as higher throughput capacity in the locks.

More specific opportunities are shown in Table 5.3.

**Table 5.3 Potential Ports & Waterways – Specific Opportunities**

<b>Opportunity</b>	<b>Location</b>	<b>Market/commodity</b>	<b>Mode</b>	<b>Activities</b>	<b>Major Advantages/ Obstacle(s)/Other implementation related comments</b>
Pre-cast Concrete; Fabricated Steel	Counties proximate to Waterway	Highway/Bridge Construction	Waterway	Pre-cast concrete; fabricated steel	Raw materials such as cement and aggregates are locally produced
Scrap Steel	Counties proximate to Waterway	Steel mini-mills downstream	Waterway	Incentives to ship materials – e.g., out of recycling centers and junk yards	Currently being handled at Port of Ft. Smith, AR; OK ports have not been interested in this business
Oversized Cargo	Counties proximate to Waterway	Aerospace industry components, esp. in Tulsa area; oil and gas drilling components; windmill components	Waterway		
Containerized General Cargo	Counties proximate to Waterway	Major retail distribution centers; local manufacturers & producers	Waterway	Various commodities	Requires regularly scheduled and reliable barge service, along with rise in fuel costs, to become attractive alternative; requires synergistic backhaul
Coal	Eastern OK mines	Power and manufacturing facilities on US inland waterway system	Waterway	Bituminous and metallurgical coal	World energy prices affect coal mining economics and local incentives
Steel Coils	Counties proximate to Waterway	Local manufacturers	Waterway	Major appliances; metal fabrications; pipes	Requires regularly scheduled and reliable barge service along with rise in fuel costs to become attractive alternative
Wood Pulp/Paper Products	Counties proximate to Waterway	Two paper mills near Waterway	Waterway	Plants process wood pulp into refined tissue paper	Container barge service required to attract this business
Minerals	Counties proximate to Waterway	New major manufacturing facility near Tulsa under construction to produce porcelain tiles	Waterway	Import clay and related raw minerals; export porcelain tiles	Minerals shipped in bulk form; finished product would likely require container barge service