

GOODS

MOVEMENT



The local and national economies rely on efficient, safe, and secure freight transportation. The movement of goods connects businesses, suppliers, markets, and consumers throughout the nation and facilitates regional specialization. Freight can be transported in various ways—single modes such as truck, rail, water, air, or pipeline or any combination of modes. Many factors influence the choice of mode for freight transportation, including access of the shipper and receiver to the particular mode; transportation, warehousing and other logistics costs; value and weight of commodities; and service characteristics specific to the mode. This interplay of factors is responsible for the modal choices of the freight market.

CURRENT FACILITIES

TRUCKING INFRASTRUCTURE

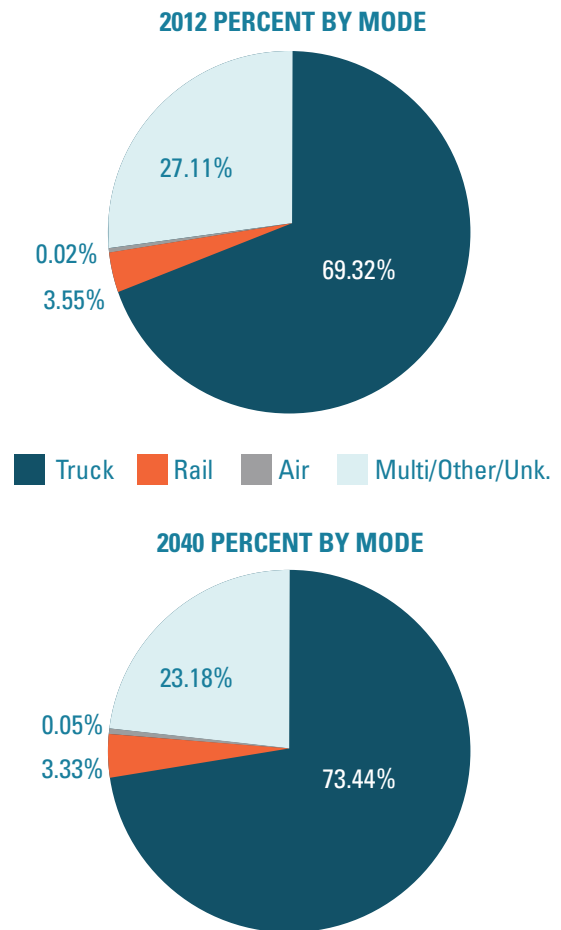
Trucking directly impacts every goods-moving industry in Oklahoma. A large number of Oklahoma communities are exclusively served by trucks for freight purposes, since they do not possess rail or airport access. Approximately 443 trucking companies operate in the OCARTS area as reflected in Table 10.1. Each is categorized as one of the four types of trucking and courier services: local trucking-without storage, trucking-except local, local trucking-with storage, and courier services-except air.

TABLE 10.1: OCARTS AREA TRUCKING COMPANIES

| COMPANY TYPE | NUMBER OF COMPANIES | PERCENTAGE OF TOTAL |
|--------------------------------|---------------------|---------------------|
| LOCAL TRUCKING WITHOUT STORAGE | 177 | 40% |
| TRUCKING EXCEPT LOCAL | 198 | 45% |
| LOCAL TRUCKING WITH STORAGE | 10 | 2% |
| COURIER SERVICES EXCEPT BY AIR | 58 | 13% |
| Total | 443 | 100% |

Roadways are critical components of the freight transportation system. The performance of the highway and street network is directly tied to the efficiency of truck transportation. Reliable travel times are critical to truckers who serve just-in-time manufacturing and distribution systems. The National Highway System (NHS) within the OCARTS area, which includes all

FIGURE 10.1: PERCENT OF FREIGHT MOVEMENT BY MODE, 2012 AND 2040



Interstates, certain U.S. Highways and State Highways, as well as all NHS connectors, best describes the region’s designated truck routes.

Truck terminals are used for handling and sorting freight, storage and maintenance of trucks, and administrative and operational functions, and are characterized by a large amount of truck traffic. The truck terminals shown in Figure 10.2 are expressed by the associated number of employees. Warehouses are used for the handling and sorting of freight, as well as the temporary storage of goods before their distribution, and may belong to either a major manufacturer or a trucking company. Many major manufacturers also operate freight terminals. The manufacturing facilities are based on the OCARTS employment database. These terminals mark the origin of truck freight within the OCARTS area. Table 10.2 reflects the inbound, outbound, and intraregional freight transported by truck in the OCARTS area in 2012 and anticipated in 2040. Overall, truck freight is anticipated to grow by just over 43 percent.

FIGURE 10.2: 2010 OCARTS AREA TRUCK FACILITIES

OCARTS AREA TRUCK FACILITIES (2010)

LEGEND

TRUCK TERMINALS (BY NUMBER OF EMPLOYEES)

- 1 - 50
- 51 - 250
- 251 OR GREATER

BASE MAP ELEMENTS

- LIMITED ACCESS FACILITIES
- ARTERIAL ROADS
- RAIL LINES
- OCARTS BOUNDARY
- COUNTY BOUNDARIES
- CITY BOUNDARIES

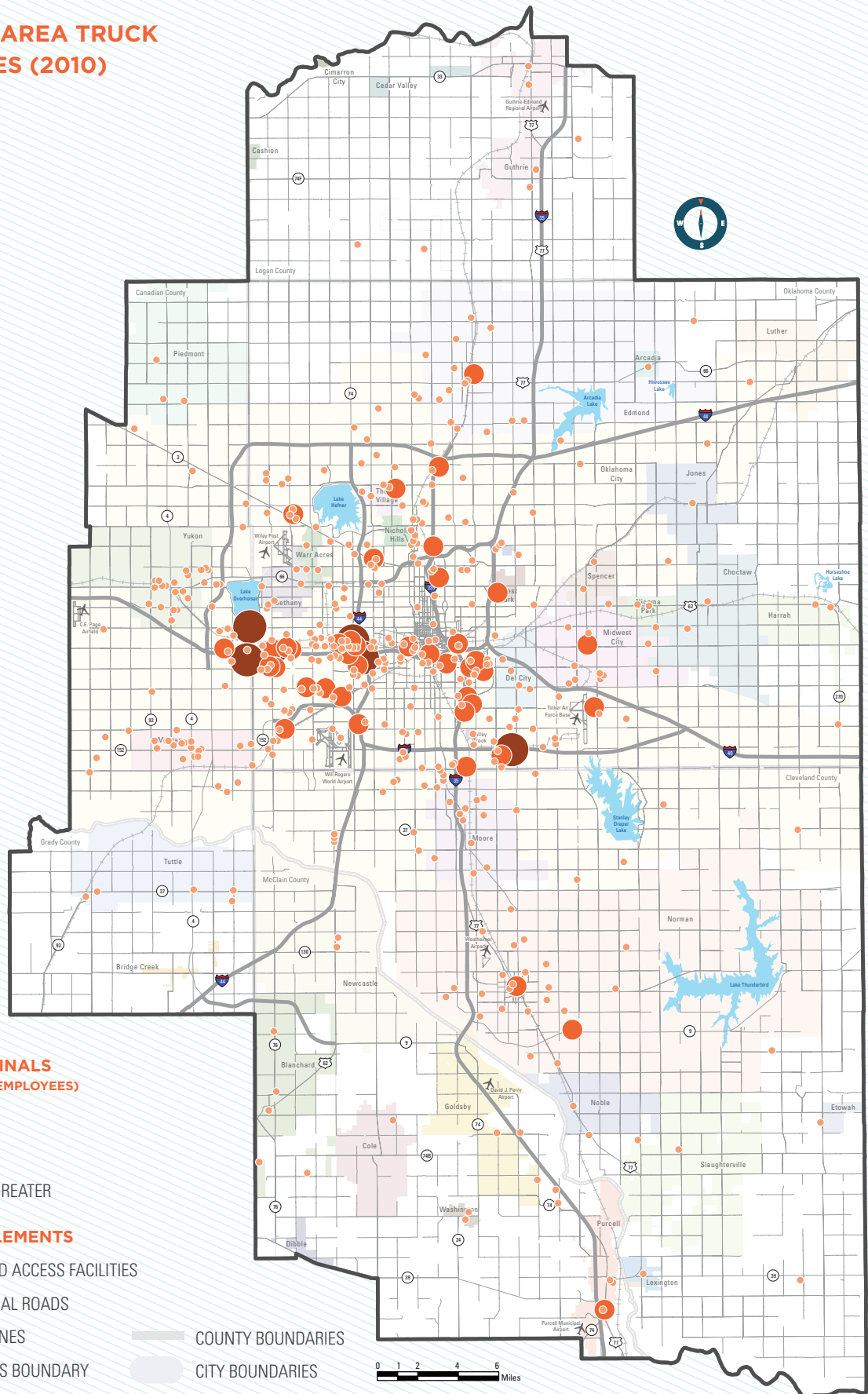


TABLE 10.2: 2012 AND 2040 INBOUND, OUTBOUND, AND INTRAREGIONAL FREIGHT TRANSPORTED BY TRUCK

| TRUCK FREIGHT | 2012 TONNAGE | 2040 TONNAGE | 2012- 2040 % CHANGE | ANNUAL AVERAGE GROWTH RATE |
|---------------|---------------|----------------|---------------------|----------------------------|
| INBOUND | 24,847,769.70 | 35,195,822.50 | 41.65% | 1.25% |
| OUTBOUND | 9,544,189.70 | 14,287,010.90 | 49.69% | 1.45% |
| INTRAREGIONAL | 36,207,520.40 | 51,763,160.80 | 42.96% | 1.28% |
| TOTAL TRUCK | 70,599,479.80 | 101,245,994.20 | 43.41% | 1.30% |

Source: Freight Analysis Framework, Version 4, Federal Highway Administration, 2012 (Excludes through truck traffic)

TABLE 10.3: 2012 AND 2040 INBOUND, OUTBOUND, AND INTRAREGIONAL FREIGHT TRANSPORTED BY RAIL

| RAIL FREIGHT | 2012 TONNAGE | 2040 TONNAGE | 2012- 2040 % CHANGE | ANNUAL AVERAGE GROWTH RATE |
|---------------|--------------|--------------|---------------------|----------------------------|
| INBOUND | 2,690,009.70 | 3,396,603.00 | 26.27% | 0.84% |
| OUTBOUND | 560,608.90 | 626,269.20 | 11.71% | 0.40% |
| INTRAREGIONAL | 361,031.90 | 567,939.90 | 57.31% | 1.63% |
| TOTAL RAIL | 3,611,650.50 | 4,590,812.10 | 27.11% | 0.86% |

Source: Freight Analysis Framework, Version 4, Federal Highway Administration, 2012

RAILROAD INFRASTRUCTURE

Within the OCARTS area, rail moves about 6 percent of the outbound freight tonnage, and about 2.7 percent of inbound tonnage.

Since the early 1980's, the Oklahoma Department of Transportation has taken an active role in planning and operating the rail system in response to the loss of major rail carriers and a large number of rail abandonments. A large portion of tracks owned by ODOT are leased to Union Pacific (UP), a Class I railroad company, and other portions are leased to two Class III railroad companies, thus aiding in the preservation of existing rail infrastructure. In addition, the railroad companies have executed multiple trackage right agreements among each other to allow full utilization of the existing infrastructure. The primary users of the railroad tracks within the OCARTS area are shown in Figure 10.3, along with the location of rail-truck intermodal facilities.

Class I railroad companies represent rail lines operated by large-scale railroad corporations, serving the nationwide

market. The OCARTS area is served by two Class I railroads—Burlington Northern Santa Fe (BNSF) and Union Pacific (UP). BNSF operates on the most extensive network of tracks within the study area. Amtrak has trackage rights on BNSF owned tracks. Additionally, as a consequence of a merger, BNSF began operating two parallel east-west lines through Oklahoma City. Due to this, ODOT decided to consolidate and streamline rail operations with an I-40 Crosstown Freeway project. This project aims to eliminate several street level crossings through downtown, as well as provide BNSF and UP with new operating facilities.

More information can be found here:

<http://www.okladot.state.ok.us/rail/rail-plan/index.php>.

Short Lines or Class III railroads also operate in the OCARTS area. They represent small-scale rail lines, which are usually locally operated, and function only within a single state or a few contiguous states. Two Class III railroads operate within the OCARTS area—Southern Kansas & Oklahoma Railroad (SKOL) and Stillwater Central Railroad (SLWC). The railroad

FIGURE 10.3: 2010 OCARTS AREA RAIL FACILITIES

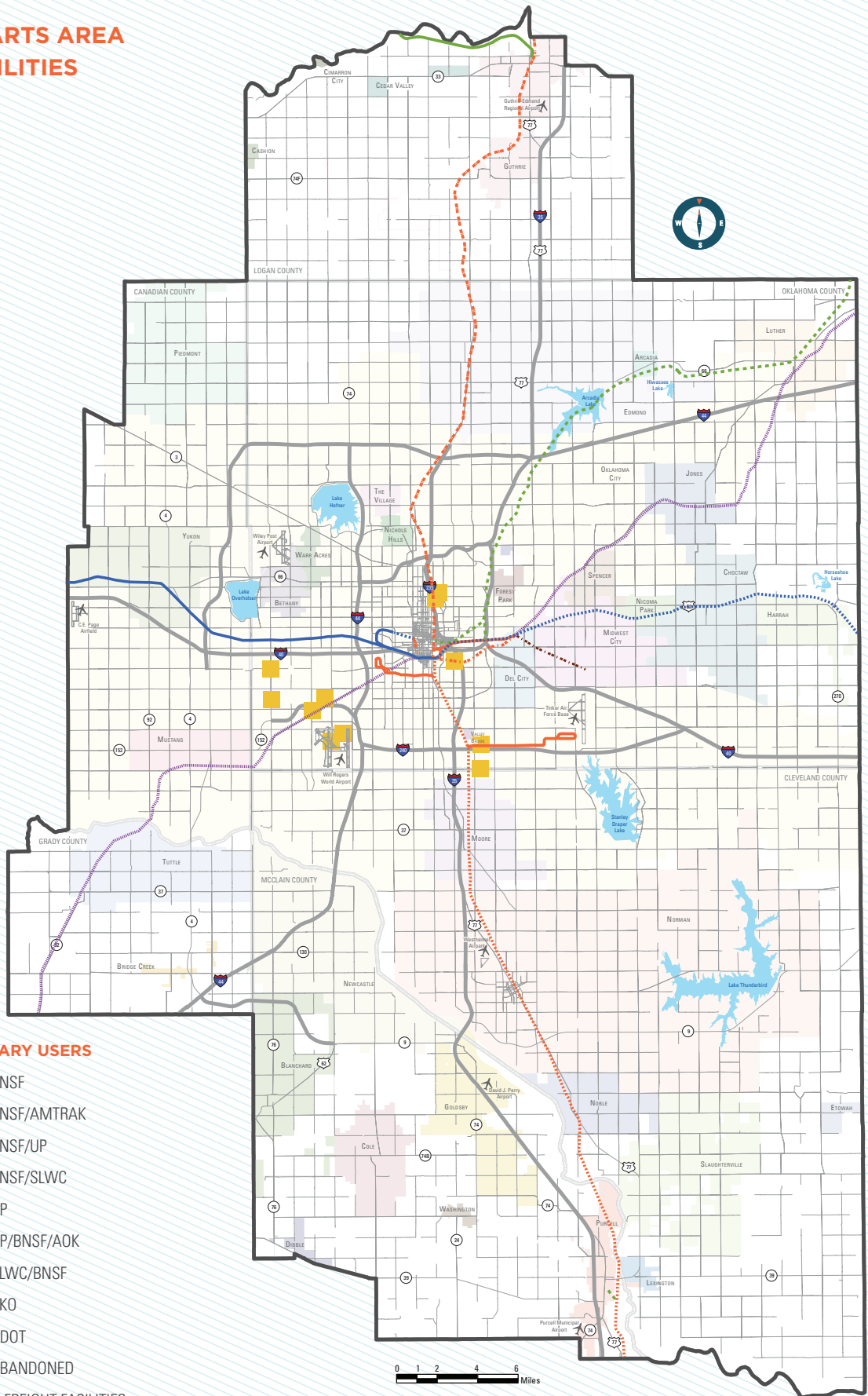
2010 OCARTS AREA RAIL FACILITIES

LEGEND

RAIL BY PRIMARY USERS

- BNSF
- - - BNSF/AMTRAK
- · - · - BNSF/UP
- · - · - BNSF/SLWC
- UP
- - - UP/BNSF/AOK
- · - · - SLWC/BNSF
- - - SKO
- ODOT
- - - ABANDONED

■ INTERMODAL FREIGHT FACILITIES



companies have taken up operations on multiple miles of state owned tracks, based on a long-term lease and operating agreement with the ODOT.

Table 10.3 reflects inbound, outbound, and intraregional freight tonnage moved by rail in the OCARTS area in 2012 and anticipated in 2040.

AIR FREIGHT INFRASTRUCTURE

Air cargo is suited to goods with a high time value, such as perishables, electronic parts, apparel, shoes, printed material, and pharmaceuticals. Because of time advantages, shippers are willing to pay higher transportation costs to deliver goods in days versus weeks and, thus, are more likely to pay higher costs to ensure reliable, rapid delivery.

A fraction of one percent of freight is carried in and out of the OCARTS area via air carrier operations, a trend typical for all of Oklahoma’s air freight movements. The OCARTS area does not contain a major hub airport and therefore has no significant portion of through-freight transported by air. Although representing only a small portion of total shipments, air carrier operations are critical because they have a higher proportionate share of high value shipments and carry the full load of airmail operations. The majority of OCARTS air freight is handled through the only commercial airport in the metropolitan area—Will Rogers World Airport.

The Will Rogers World Airport terminal is located approximately two miles from State Highway 152 and four miles from Interstate 44. A general warehouse at Will Rogers World Airport offers storage that can accommodate a wide variety of goods and containers, including intermodal containers on chassis. The warehouse is accessible via Interstate 44. Neither the air

freight terminals nor the airport warehouse have direct access to rail service. However, the Oklahoma City Department of Airports and the Oklahoma City Airport Trust recently designated approximately 1,000 acres on the east side of Will Rogers Airport as multi-use and multi-industry business development. Three primary areas of development have been designated. They include: direct aviation, aviation support, and retail/industrial/office land uses. Each of these development areas will help to provide better services and access for the freight and manufacturing industries. More information on the Lariat Landing project can be found here: <http://www.flyokc.com/CurrentProjects.aspx>.

The Port Authority at Will Rogers World Airport is the governing board of Oklahoma’s largest Foreign Trade Zone (FTZ), having responsibility for a 41-county region in central and western Oklahoma. FTZs are sites within the U.S. where foreign and domestic goods are considered to be international commerce. Goods are admitted to the zone without formal U.S. Customs entry and the payment of duty is deferred and, under certain circumstances, reduced or eliminated. Within the zone, goods may be stored, tested, relabeled or repackaged, exhibited, mixed with domestic and/or foreign material, and used in assembly or manufacturing processes. Goods or finished products from a FTZ entering the U.S. commerce are subject to duty and taxes. Goods or finished products exported and destined for international commerce from the zone are not subject to duty and taxes.

More information on the FTZ can be found here:
<http://foreigntradezone106.org/index.php>.

Table 10.4 reflects the 2012 inbound and outbound airfreight tonnage within the OCARTS area and its anticipated growth through the 2040 forecast year.

TABLE 10.4: 2012 AND 2040 INBOUND AND OUTBOUND FREIGHT TRANSPORTED BY AIR

| AIR FREIGHT | 2012 TONNAGE | 2040 TONNAGE | 2012- 2040 % CHANGE | ANNUAL AVERAGE GROWTH RATE |
|---------------|--------------|--------------|---------------------|----------------------------|
| INBOUND | 7,484.50 | 12,918.10 | 72.60% | 1.97% |
| OUTBOUND | 16,563.80 | 54,094.20 | 226.58% | 4.32% |
| INTRAREGIONAL | - | - | 0.00% | 0.00% |
| TOTAL AIR | 24,048.30 | 67,012.30 | 178.66% | 3.73% |

Source: Freight Analysis Framework, Version 4, Federal Highway Administration, 2012

GOODS MOVEMENT NEEDS AND CHALLENGES

Below are goods movement issues and concerns raised as a result of the Encompass 2040 Transportation Survey, the Open House, and by freight stakeholders.

TRUCK FREIGHT

Design Improvements and Elimination of Safety Hazards

Since goods movement by truck relies on OCARTS interstates, highways, and arterials, the needs of motor carriers should be considered in the design and maintenance of the region's roads and bridges. Insufficient turning radii, insufficient queuing length at off-ramps or intersections, and other trucking safety hazards need to be considered in roadway design.

Congestion and Delays

As congestion steadily grows on the street and highway network, so do delays and costs to consumers. The growth of truck traffic and the overall growth of traffic volumes on major highway facilities through 2040 will lead to significantly increased congestion levels.

Increase of Network Capacity and Use of Intelligent Transportation Systems

Continued reliance on adding lanes as a means of congestion relief is financially and physically impractical. Capacity improvements are possible by managing the existing system more efficiently through the use of Intelligent Transportation Systems (ITS) technologies.

Truck Rerouting

According to the trucking industry, rerouting through truck traffic would result in better traffic conditions than creating separate truck lanes. This would be especially beneficial in rerouting hazardous materials around populated areas.

Diverting Truck Freight onto Rail

An interest in diverting long-haul truck freight onto rail, especially dry bulk commodities, was expressed by the trucking industry as well, thus freeing up additional roadway capacity. The key to such operations lies within increased partnerships and better intermodal connections.

Use of Triple-Trailers, Pavement and Bridge Stress

Only a few states, including Oklahoma, allow the use of double trailer rigs. The trucking industry is considering the effects of using three-trailer, six-axle vehicles, which would be capable

of carrying up to 90,000 lbs. The rationale is to be able to "take one out of every nine vehicles" off the roadway, which would free up capacity. It is also said to be less strenuous on the road pavement, which seems to be affected more by the number of trucks rather than simply the weight of the vehicle. The life-span of bridges, however, is affected differently than the pavement and reacts to the number of trucks, total weight, axle weight, axle distance, and other factors. The impact of the proposed type of truck on pavement, as well as bridges, will therefore require further study.

Change in Shipper Behavior

Although just-in-time delivery will continue to play an important role in the freight industry, some shippers have returned to larger "safety stock" inventories after the lessons learned during a 2002 port strike.

Time-definite Trucking versus Air Freight

Time-definite trucking competes directly with air freight. Shippers see an advantage in the drastically reduced transportation costs, if their freight does not require overnight forwarding.

Intermodal Trends

There has been a dramatic increase in containerization, although the OCARTS area seems a less likely candidate for these trends, due to its lack of intermodal facilities.

RAIL FREIGHT

The following rail freight issues and concerns should be considered when making improvements to the existing transportation network.

Oklahoma Freight and Passenger Rail Plan

The Oklahoma Department of Transportation is developing a new comprehensive Freight and Passenger Rail Plan in 2012 to guide the state's planning efforts for freight and passenger rail into one single coordinated effort. Issues of economy, mobility, safety, environmental sustainability and current and future needs of Oklahoma rail were evaluated. More information is available at <http://www.okladot.state.ok.us/rail/rail-plan>.

Improving Rail Service and Intermodal Connectivity

Track and rail yard construction and maintenance are the responsibility of the railroad company owning the facility. Private investments are market driven, and ODOT investments into state owned rail infrastructure are limited by the amount of special funds available.

Interstate Rail moving Freight

Rail supporters have stated a need for additional interstate rail options to transport raw materials and finished products between key locations in Oklahoma and neighboring states.

Industry Approach to Rail Freight Growth

The rail industry is able to accommodate expected growth with the existing capacities for the near future. However, its sustained ability to accommodate potential freight diverted from trucks will depend on working with ODOT to improve the intermodal capabilities of the existing rail yards, making way for an increase in trucking-rail partnerships.

Trends in Rail Transportation

Recent developments in containerization and other intermodal initiatives could prove to have a revitalizing effect on rail transportation in the OCARTS area, provided that adequate facilities will exist:

- The use of railroaders—semitrailers specially designed to travel both on highways and on rails—is increasing. The OCARTS area does not yet have a yard capable of handling railroaders.
- Another industry trend is the use of micro containers. These containers are small enough to be lifted off trains and transferred to trucks even outside of specially designed intermodal facilities.
- Additionally, a trend exists towards freight transportation in mega-sized container ships. Such shipments are capable of feeding certain northeastern ports, but could bypass the OCARTS area.

Air Quality

Due to better fuel efficiency, an increased use of rail freight over truck freight may preserve or even improve air quality within the OCARTS area. This is an important issue, especially in light of the current air quality standards and the prospect of more stringent standards in the near future.

Safety

With over 300 at-grade rail crossings within the OCARTS area, the need for grade-separated crossings and implementation of the frontage road concept remain top priorities, since a projected increase in rail freight has the potential of creating greater safety risks. Other rail safety issues include:

- Need for crossing improvements and increase in safety features at railroad intersections with urban arterials and highways;
- Concerns about possibility of broken rails causing derailments on main line railroad tracks; and

- Problems associated with the transport of chemicals and hazardous material through the heavily populated, urbanized areas.

AIR FREIGHT

The following air freight issues and concerns should be considered when making improvements to the existing transportation network.

Congestion on Airport Access Roads

In the OCARTS area, air-to-truck goods transfers are the only intermodal aspect of air freight movement. Therefore, accessibility of airports via the existing street and highway network and future connectivity to other modes of transportation is vital to maintaining traffic flow and reducing delays around area airports.

Trends in Air Freight Transportation

A 178 percent increase in air freight tonnage is projected between 2012 and 2040. Just-in-time management, as well as an increase in e-commerce volume, is factored into this development. However, complete projections of the impact of e-commerce are not available at this time and its further development should be closely monitored. Time-definite trucking competes directly with air freight, offering reliability and only slightly lower delivery speeds at a fraction of the transportation cost. Higher security stock inventories and safety concerns also have an impact on air freight logistics.

Intermodal Connectivity

Air-truck transportation is expected to continue to be the main means of intermodal air freight. Since there is currently no direct connection to railroad tracks.

Increase of Network Capacity and Use of Intelligent Transportation Systems

Physical solutions to increase the capacity of the street network that provides access to the airport are limited. Intelligent Transportation Systems (ITS) technologies should continue to be explored as a way to operate the existing system more efficiently.

Transportation Planning Coordination

The Federal Aviation Administration has asked for increased coordination of transportation planning between the top 100 airports in the nation (includes Will Rogers World Airport) and the MPOs monitoring the regions' street and highway network.